

From Kant to Riemann: The Shape of Empty Space

by Lyndon H. LaRouche, Jr.

September 10, 2005¹

Within the state of education today, including higher education, regrettably, little attention is paid to the crucial importance of rigorous studies in the theory of knowledge (i.e., *epistemology*), whether in poetry, science, or government. Those studies are indispensable in the efforts to prevent present trends in combined official and public opinion from plunging our society into that terrible, sophistry-ridden state of mind, the state of life-threatening ruin, into which the population of the once powerful U.S.A., as it were a fabled Rip Van Winkle, now discovers that it had been lured during its recent long sleep.

That present situation is actually a reflection of a long-term trend already underway since the death of President Franklin Roosevelt. However, the presently immediate threat of national bankruptcy, and also worse, is a consequence of more recent trends, as typified by not only the current Bush Administration, but, the prevailing trends of both popular and academic opinion during a period of the most recent three decades.

That you might better understand how our nation did this

1. Written for, and dedicated in service to young adults who are being currently cheated of what had been, in earlier times, a reasonable financial access to an education which is both actually higher than globigerina ooze, and can be afforded by normal human beings.

to itself, take an example from some much longer-term trends. Take as one typical example of the type of mistaken thinking which led us into this mess, the case of Wilhelm Windelband. Often, we seek the source of society's afflictions in what was done to it. We tend to pay less attention to those calamities brought about by what was *not* done, or something neglected at a critical place in the shaping of that culture, which has

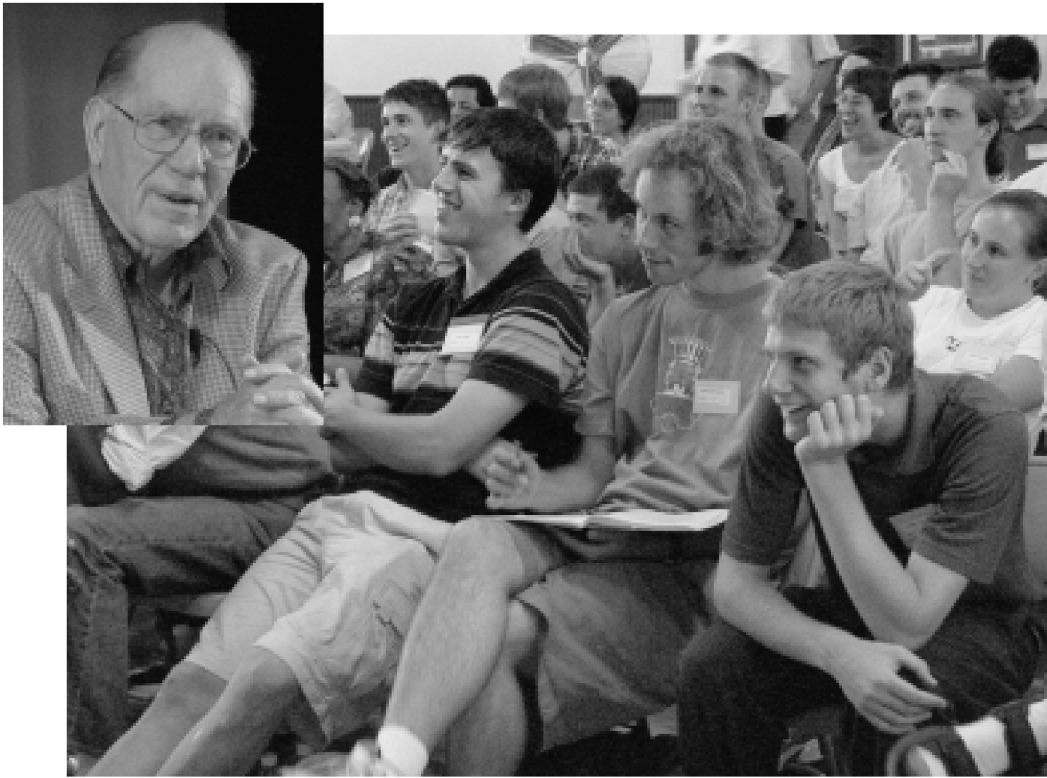
The problem is, that, for mere logicians, or mere Cartesians, time is simply measurement, by a simple mechanical clock, or a fool's measurement of the space which is marked out on a changeless map. It is a space marked out by a journey, by foot, or, perhaps, by a raft run amok in the foaming rapids, or by coach or couch.

been the foundation upon which the recent generations' way of thinking about itself was premised during more recent times. Ignorance of the way in which the principal founders of our republic thought, such as the scientist and statesman Benjamin Franklin, is an example of the dangers of a widespread lack of relevant knowledge, as the

hearings on the nomination of Judge John Roberts repeatedly illustrate the point, rather painfully. The case of Windelband fits within the latter classification.

As I shall show you here, Windelband's importance for many of you today, is that he was a fellow made all the more important for you today, by the fact that most of you simply did not know that he had once lived. It could be repeated here on that score, that what you don't know could hurt you badly. As I recently emphasized in my emphasis on the historic importance of Russia's Count Sergei Witte,² Windelband, although far less important than statesman Witte, is a figure

2. "Russia's Dark Side of the Spoon," *EIR*, Sept. 16, 2005.



EIRNS/Stuart Lewis

LaRouche at a Youth Movement cadre school in Northern Virginia in September 2005. He writes that his intention in this article, is especially to share crucial insights gained from his 1930s and early 1940s wrestling with the works of Immanuel Kant and the neo-Kantian Wilhelm Windelband, with “the generation of young adults who are now in the relevant phase of preparing to take charge of the history of the remainder of this present, young century.”

whose importance lies less in the way we might tend to view him if he is misapprehended as a kind of a fixed object from the past, than, in his real importance, as an essential, and active part of the process of transition from that which preceded him in his field, to the change in history which occurred, in part, because he had lived, or because of what he failed to do on the relevant occasion.

To repeat that point, for the sake of clarity. In the case of Windelband, you, the reader, might not have known his name until I brought it up, as I do here; but, his active role in the relevant part of history, exists within the reality defined for you by your past, whoever you might be, today. His role, in his time, is a part of the history embedded in your existence, a history which includes the effect of the transitional role which he played, for generations beyond his passing.

As I address this matter in later pages of this report, that notion of formal logic as Windelband, among others, have mistakenly defined it, is the science of empty space.³ That judgment is not merely academic; errors in matters such as that, have been permitted to determine the way in which, not only certain university professors, but public opinion, have often contributed to leading a nation to an ugly outcome,

3. Wilhelm Windelband (1858-1915) A leading representative of the late-19th-Century neo-Kantian school. Professor of Philosophy at Zürich, Freiburg, Strassburg, and Heidelberg. Otherwise noted for his treatment of ancient Greek philosophy from his neo-Kantian standpoint. My reference here is to his 1912 essay *The Principles of Logic*.

sooner or later. So, in the relatively shorter term, we witness the Bush Administration’s reckless disregard for truth in the matter of what had been a clearly foreseeable, immediate challenge of the Katrina catastrophe; so, on account of the relatively longer term, we are faced with Vice-President Dick Cheney’s fanatical drive for a permanent global state of revolutions and war. Cheney expresses thus the present-day version of the same doctrine, of “Permanent Revolution,” which a famous British intelligence asset of the last century, the Alexander Helphand also known as “Parvus,” taught, in 1905, to a famous dupe, the later Bolshevik Revolution’s Leon Trotsky. So, the past may live to menace, rather than grace the present.⁴

Windelband’s errors in defining the meaning of logic are referenced here not only because he represents a specific, appropriate choice of example of the problem I am addressing. As experienced hunters caution us, when stalking a flock of ducks overhead, aim at one; to address a general case, focus on a particular, best leading example of that case. For this moment, the effect of Windelband’s work, is our relevant “duck.”

4. Technically, British intelligence asset “Parvus” is strictly defined as an agent of the Synarchist International, from his meetings with Fabian Society circles, including Frederick Engels, in the early 1890s, through his death in 1920s Germany, where he was operating as an asset of the right-wing fanatic Coudenhove-Kalergi within the right-wing circles which prepared the way for the Adolf Hitler dictatorship.

Windelband is typical of what is by no means the only example of some, very-real-life, mass effects of miseducation, miseducation about some very practical facts and topics which might be met within the ineffably remote domains of recent programs of higher learning. My present selection of his case, rather than some others, is premised upon the relevance of his kind of special emphasis on the historically crucial fact, still today, that the roots of all modern European civilization are to be found within the philosophical history of ancient Greece.

Although, his interpretation of the philosophical issues posed by that past part of our present history is categorically flawed; unlike the relatively simple-minded positivists and post-modernists of today generally, he was focussed on the proper choice of field of contention respecting those ideas of European civilization in general, over nearly 3,000 years, which continue to be of crucial importance for global civilization today. He had the wrong answer to the most crucial questions, but, as I shall show in the body of this report, he focussed his attention on the right questions.

My treatment of the subject of logic here, includes consideration of important contributing causes of certain very practi-

cal, very important effects for society as a whole today. These are causes like those which have contributed, in principle, to the present, self-inflicted, deadly state of ruin of our U.S.A. as a whole, as the world as a whole has sampled these effects now, in the outcome of the current Bush Administration's awful negligence, in the coastal regions of Louisiana, Mississippi, and Alabama. In writing this report, I am considering, thus, the effects produced by the awful negligence of that rather empty-headed President, and also by the defective moral inclinations, the wild-eyed sophistries produced out of what malicious humorists might name as Bush's own, and his cronies' mental powers. However, I also emphasize Bush himself less, than I blame the corruption of the public mind which permitted a figure of such abysmal lack of fitness to come to occupy that office of the President today.

Windelband, although of a much nobler character than is shared among the clownish Bush cabal, typifies one kind of the most profoundly damaging of such widespread, relevant problems created by the influence on our institutions such as the Presidency, by modern academic disorders. In the matter of the failures of public opinion expressed by the selection of that President, I point here and now to the ancient roots of the

Heine on Immanuel Kant

Heinrich Heine (1797-1856) was one of Germany's most beloved poets and commentators, known for his biting criticism of Romanticism. The following is excerpted from "Concerning the History of Religion and Philosophy in Germany," Heinrich Heine, Selected Works, trans. by Helen M. Mustard (New York: Random House, Inc., 1973).

The history of Immanuel Kant's life is difficult to portray, for he had neither life nor history. He led a mechanically ordered, almost abstract bachelor existence in a quiet, remote little street in Koenigsberg, an old town on the northeastern border of Germany. I do not believe that the great clock of the cathedral there performed more dispassionately and methodically its outward routine of the day than did its fellow countryman Immanuel Kant. Getting up in the morning, drinking coffee, writing, giving lectures, eating, walking, everything had its appointed time, and the neighbors knew for certain that it was half-past three when Immanuel Kant, in his gray frock-coat, his Spanish cane in his hand, stepped out of his house and strolled to the little linden avenue called after him to this day the "Philosopher's Path." Eight times he walked up and down it, in every season of the year, and when the sky was overcast,

or gray clouds announced a rain coming, old Lampe, his servant, was seen walking anxiously behind him with a big umbrella under his arm, like an image of providence.

What a strange contrast between the outward life of the man and his destructive, world-crushing thoughts! Truly, if the citizens of Koenigsberg had had any premonition of the full significance of his ideas, they would have felt a far more terrifying dread at the presence of this man than at the sight of an executioner, an executioner who merely executes people. But the good folk saw in him nothing but a professor of philosophy, and as he passed by at his customary hour, they gave him a friendly greeting and perhaps set their watches by him.

If, however, Immanuel Kant, the arch-destroyer in the realm of ideas, far surpassed Maximilian Robespierre in terrorism, yet he possessed many similarities with the latter which invite comparison of the two men. In the first place, we find in both the same stubborn, keen, unpoetic, sober integrity. We also find in both the same talent for suspicion, only that the one directs his suspicion toward ideas and calls it criticism, while the other applies it to people and entitles it republican virtue. But both represented in the highest degree the type of provincial bourgeois. Nature had destined them to weigh coffee and sugar, but Fate determined that they should weigh other things and placed on the scales of the one a king, on the scales of the other a god.

And they gave the correct weight!

present causes for our current national misfortunes.

We must always recognize the current situation which confronts us now, as something which had been implicitly permitted to happen, something which should have been recognized as a consequence of a general, long-standing failure to acknowledge the fact, that the space to which modern formal logic refers, is not the real space which actions and their consequences occupy. Admittedly, President Bush's failures are not the fruit of a logical mind, but his selection for that office was the fruit of what many influential and other people have regarded as a logical choice of behavior on their own part.

This failure of the reliance on what has been, chiefly, a merely popular definition of logical mental behavior, is a problem typified by the silliness of today's popular blind faith in the practice of substituting the use of so-called "statistics," the view from a kind of "ivory tower" outside reality, for study of the functionally ontological characteristics of the physical processes which need to be examined.

For example: Virtually no branch of combined official and popular practice today, is more lunatic, more corrupt, and ultimately more suicidal for national economies as wholes, than the currently prevalent chatter about the statistical behavior of "the market." Bush himself may be a complete stranger to reasonable mental behavior, but the popular support he has received, is, quite obviously, the consequence of a leading problem in the way many people have, twice, foolishly tolerated the selection of Bush as a President.

The Relevant Flaw of Logic

Contrary to what passes for today's allegedly conventional opinion on this subject, real space is neither empty, nor statistical, but physical.

Physically, real space is essentially spherical and dynamic *in its sensory apprehension*. The use of the term, "formal logic," on the other hand, usually refers, by today's popular U.S. traditions, to a dead, empty, merely Cartesian space, in which a physically efficient notion of something as elementary and important as actual "time," does not exist. What is needed, instead of that deadness of formal logic, is that notion of *physical time* implicit in Fermat's discovery of the universal principle of *physical least time*. Fermat's discovery of the principle of *physical least time*, is one, which, together with the preceding discoveries of Johannes Kepler, has been the launching-point for all leading achievements in the development of all competent notions of the principles of a modern physical science, those by Leibniz and his followers.

The problem is, that, for mere logicians, or mere Cartesians, time is simply measurement, by a simple mechanical clock, or a fool's measurement of the space which is marked out on a changeless map. It is a space marked out by a journey, by foot, or, perhaps, by a raft run amok in the foaming rapids, or by coach or couch.

The ultimate standard of measurement for such journeys,



Poor Immanuel Kant "has been assigned implicitly, since his death, to a permanent place in Hell. There he were to be seen today, justly tortured throughout timeless eternity, by his confrontation with the physical reality of the physical time which he had denied in life."

is reported by, among others, neo-Kantian Wilhelm Windelband's image of Kant's perfectly logical intuition of absolutely nothing which is real. Windelband presents us a portrait of Kant which lacks the image of Kant's most relevant philosophical feature. Compare the truer portrait of Kant, the image of the specter portrayed by Heinrich Heine's *Religion and Philosophy in Germany*. Heine's Kant, unlike Windelband's neo-Kant, was the real Kant, as he must be seen as a citizen of sworn fealty to the idea of changeless, Cartesian time: not as a solitary figure, but with the indispensable complement of any dutifully Kantian: the spectacle of a recurring nightmare of Kant and his trailing servant, the latter a virtual, truly Kantian, practical negation of the negation, one bearing a daily, clock-setting umbrella.⁵ It is a true recurring nightmare, in which nothing important, even the horror of it all, ever changes. Heine's ironical image of that Kant, rather than Windelband's, was, and is the real Kant, as known to those of us who have made a thorough study of the arguments he presented in his later years.

What Windelband appeared not to have known, in overlooking an insight by Heine which was readily accessible to him, is that the actual poor Kant has been assigned implicitly,

5. The real-life image of Kant supplied by Heine, recalls the leading academics from the opening paragraphs of Chapter 2 of Jonathan Swift's "Voyage to Laputa." Heine's description of the relationship of Kant to his servant is a startling reminder of Swift's account: "I observed here and there many in the Habit of Servants with a blown Bladder fastened like a Flail to the end of a short Stick. In each Bladder was a small quantity of dried Pease, or little Pebbles. . . . This Flapper is likewise employed diligently to attend the Master in his Walks. . . ."

since his death, to a permanent place in Hell. There he were to be seen today, justly tortured throughout timeless eternity, by his confrontation with the physical reality of the *physical time* which he had denied in life. In that timeless repose, his cruelest torment is, without much doubt, the irony of the ridicule he suffers, as Heinrich Heine had foreseen, as having been the predecessor of the endless “end of history’s” G. W. F. Hegel.⁶

I have made the choice of the name of Windelband as a benchmark here, to illustrate, from within the Classical European setting, as traced from ancient Greece, the specific kind of problem shown by those foolish, academically conditioned fellows who have paid no proper attention to the implications of Bernhard Riemann’s revolution. I emphasize the way, since Riemann, that really intelligent kinds of educated people either think, or should think about the universe today.

The point of this selection is to illustrate the perils of travelling by couch, especially in the hellishly non-existent space of the contemporary “spoon bender’s” so-called science fiction. During the 1970s, I had used Sigmund Freud as the scapegoat for this instruction; but, today, Freud’s unkempt couch has become insufferably smellier than any sort of goat, with the decades which have passed upon it since that time.

Dramatis Personae

To understand the significance of Kant in a general, but nonetheless thoroughly valid way, several benchmarks from the Eighteenth Century would be sufficient. Windelband alludes obliquely to some of these points, but his intentions on that account, as in his 1912 essay, are nonetheless clear.⁷

The simplest way to do this, is to place Kant and his opponent Abraham Kästner side by side in the century which they shared. Kästner, born in 1719, in Saxon Leipzig, the birthplace of Gottfried Leibniz, and deceased in 1800, versus Kant, born in Königsberg in 1724, and died in 1804. Notably, Kant died approximately a year before the death, in 1805, of Kant’s most significant philosophical adversary of his later years, Friedrich Schiller.

6. Heine, “Concerning the History of Religion and Philosophy in Germany,” in *Heinrich Heine, Selected Works*, trans. by Helen M. Mustard (New York: Random House, Inc., 1973). Hegel’s later works, during the period he was associated with the political operations in Germany of both Austria’s Prince Metternich and the right-wing ideologue and predecessor of Carl Schmitt, Friedrich von Savigny, in doctrines of law were actually an ideological model for the national form of fascist state. This takes into account the role of Professor Leo Strauss’s sponsor, Carl Schmitt, as “Crown Jurist,” in founding the Nazi state of Adolf Hitler’s post-February 1933 reign. Of the Quixotic figure of the personally loutish Hegel himself, it could be said, that he dwelt in a blackness in which all important cows were knights. Hegel’s “end of history,” like that of our notorious neo-conservative Francis Fukuyama’s, is nothing but the delusion of all empires, the Roman Empire particularly, a domain where brutish legions roam, killing time itself with the permanently perpetual warfare of Synarchist Alexander Helphand’s doctrine of “permanent revolution.”

7. Windelband, *The Principles of Logic*.

Kästner devoted his adult life to defense of the work of fellow-Saxons Leibniz and J.S. Bach against their enemies of that century. Leibniz-hater Kant reflected his father’s Scottish origins in the worst possible light, in his role as the intellectual lackey of the mentally unstable David Hume, until the concluding decades of Kant’s own life. Then, Kant openly broke his official intellectual ties with Hume, and subsequently produced the series on the subject of so-called “Critical Philosophy” published during the 1780s and early 1790s.

The pivot of Kant’s break with Hume had been the implications of the American Revolution’s Leibnizian philosophical triumph over the Anglo-Dutch Liberalism represented by John Locke and, more immediately, Hume, and by the hater of the American Declaration of Independence, Lord Shelburne’s lackey Adam Smith.⁸ The implications of that are underlined by the fact that Smith’s most celebrated writing, his so-called *The Wealth of Nations*, is a propaganda tract which was predominantly a ranting spew of hatred against the cause represented by the U.S. Declaration of Independence. The rallying of continental Europe, more and more, around the American cause, as the League of Armed Neutrality expressed this, had deep philosophical implications for all of Europe, especially continental Europe, Kant included.

The period of the late 1770s and the 1780s, preceding the French Revolution on the continent, had an impact on Europe in which Kant found an increasingly favorable reception for his *Critiques* through the close of the century, until the successive horrors of both the French Revolution and Napoleon’s imperial rampages produced, after Jena-Auerstädt, a leftist-turned-reactionary—a virtual fascist—Hegel, to challenge, and replace the official literary place of Kant in the usages of the then contemporary German language.⁹

Later, long after Kant’s death, in the last quarter of the Nineteenth Century, Windelband appeared as a leader among those now styled as neo-Kantians, who attempted to rehabilitate the reputation of a Kant whose influence had been discredited by the turbulent developments in physical science and politics during more than sixty years since his death.

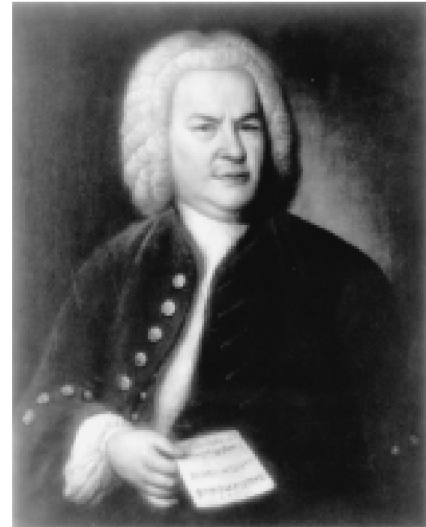
The actual Kant had been largely discredited as irrelevant to current history, by the cumulative effect of the developments and institutions of the nation-state and its economy over the 1789-1876 interval. The Critical philosophy of Kant was superseded by the Hegel who considered himself more

8. The event which defined the setting of that event was the Paris Treaty of February 1763 which established the British East India Company as an empire in fact. The effect of this should be seen from those implications of that treaty for Frederick the Great’s Prussia, and the developments associated with British orchestration of the Seven Years’ War which established British relative hegemony on the continent.

9. The intellectual kinship of Bonaparte-lover Hegel to Bonaparte-creator Count Joseph de Maistre, and the roots of Synarchist-created Hitler’s regime in the creation of Bonaparte by Martinist de Maistre, is key to understanding the ugly implications of the largely congruent, rival influences of both Kant and Hegel on the history of Germany.



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Left to right: Abraham Kästner, Gottfried Leibniz, and Johann Sebastian Bach. Kästner was the most prolific teacher of mathematics during the middle to late years of the 18th Century, and the teacher of Carl F. Gauss. He devoted his life to defense of the work of fellow-Saxons Leibniz (1646-1716) and Bach (1685-1750) against their enemies in his own century—such as Kant.

critical than Kant, and, later, those who deemed themselves even more critically critical of Hegel.

Then came the time, through and immediately following the defeat of the British Empire's failed attempts to crush the U.S.A. virtually out of existence. During the middle of the Nineteenth Century, this attempt to eliminate the U.S.A. had been made as a package of onslaughts, including the launching of Lord Palmerston's Confederacy puppet and the installation of the failed, "Adolf Hitler"-like tyrant Maximilian in Mexico.¹⁰ The triumph of the U.S. model of economy and statecraft, which was celebrated in the 1876 Philadelphia Centennial, unleashed sweeping changes in the progress of modern agro-industrial development in continental Europe, as in Bismarck's Germany, and Japan.

The world was then torn, by the global impact of the aftermath of the U.S. developments of 1863-1877, by a titanic struggle between British ideology and the spread of the ideas of the American System of political-economy throughout the Americas and much of Eurasia. On the one side, there was the imperial power of the Anglo-Dutch Liberalism represented by Great Britain, and, the principal alternative, the American System. Both alternatives were alien to the specific kind of German Romanticism associated with the name of Kant. Over the period through World War I, this pattern was to become increasingly complicated by strange things, such as the pathetic influence of Ernst Mach, and the rabid existentialism of Nietzsche and his like, which invaded Germany from the decadence of Habsburg Austria

10. The Anglo-French Austrian puppet, the Emperor Maximilian, became, not accidentally, a flagship figure of the spread of the Nazi organization there, during and after Adolf Hitler's reign, still to the present day.

and sponsorship from the British side.

So, during the last decades of the Nineteenth Century, a revised view of Kant emerged as neo-Kantianism. Windelband was a notable author of this turn. This was not the actual Kant encountered during the interval defined by the period of the so-called "Enlightenment" marked by the American and French revolutions; Windelband's reconstructed, literary "Kant," was a reaction against, among other things, the impact of the U.S.-modelled Bismarck reforms, from 1877 on, and also against both the radical empiricism and positivism emerging in Britain and Habsburg Austria, and the "Americanization" expressed by the combined social-welfare reforms and industrialization launched under Bismarck.

The dividing issue in all of this, was the principle of human creativity, as typified by those discoveries of universal physical principles which had been banned, under threat of the harshest possible penalties, by the Olympian Zeus of Aeschylus' *Prometheus Bound*. Leibniz, like Kepler and Fermat before him, was the embodiment of that forbidden practice of creativity. Locke and Hume, and the Kant of his empiricist phase, like Adam Smith, were the embodiment of a neo-Olympian hatred of creativity. The American Revolution was creativity. France's Ecole Polytechnique and Lazare Carnot, were an epitome of creativity. The German scientists associated with Wilhelm von Humboldt were the typification of scientific creativity. Bismarck's adoption of the American model for industrial development, was an expression of creativity. Neo-Kantianism was a reaction, like both philosophical phases of Leibniz-hater Kant's own life, of virtually embittered, Olympian-like hatred of creativity.

Neo-Kantianism borrowed something essential from the old Kant, in a quality of hatred of creativity echoing that

hatred of actual human creativity radiated by the Delphic cult of Apollo. Kant, and neo-Kant, were essentially *Apollonians*. It was that Apollonian mood which defined the tradition of the German-speaking Kantian, in science, in inclination toward the Romantic in fields of art, and in political inclinations. Kant represented much that such German Romantics might find embarrassing in themselves. Kant's famous proposal for "universal peace," expresses that pathetic Romanticism inherent in Kant's world-outlook.

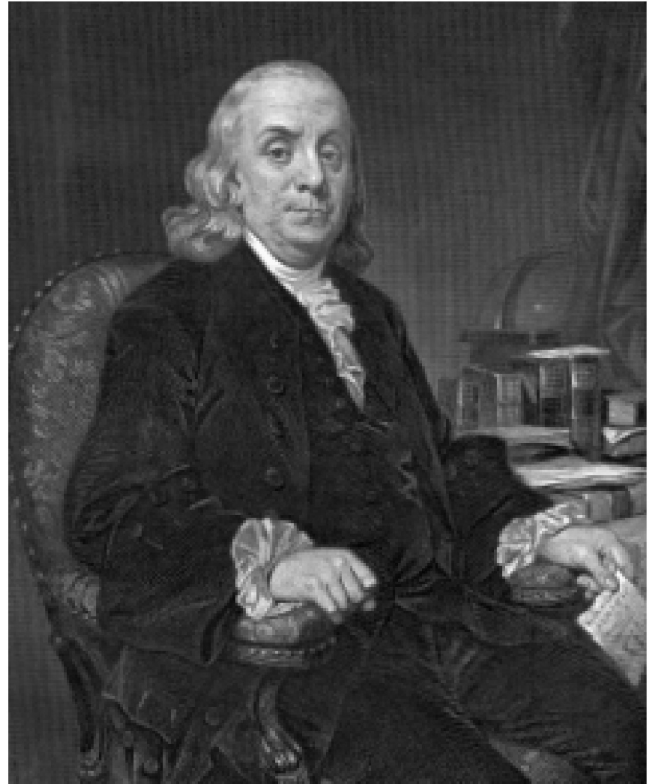
This is not to say that Kant lacked intellectual power. His expressed contempt, during his later "Critical" decades, for his former idol David Hume, was a succinct, brutal expression of truly deadly insight. His wit, which was not always original, is typified by his reference to one man milking a he-goat while the other held the sieve. His treatment of "repression"-driven reaction-formation, in his postulating the "negation of the negation" as "positive," in his *Critique of Practical Reason*, reflected a specific instance of the large margin of superiority of Kant's intellect over that of Sigmund Freud.

Kant's own essential shortcomings have a very specific basis, his fidelity to the tradition of that Apollo cult of Delphi as reflected in Aeschylus' *Prometheus Bound*: the prohibition of the kind of creative reason which both the Zeus of *Prometheus Bound* and the practice of the actual Apollo cult, banned from human social behavior. Within those boundaries, Kant could be clever, and sometimes was. It was those who lacked a sense of actual creativity, who were seduced by Kant, seduced because they found in Kant an apology, that of the constipated intellectual formalist, for the lack of creativity shown by their "hysterically blocked" mental life. It was this syndrome in his mental life, which had qualified Kant as an acceptable paragon of the creatively constipated victims of the "Enlightenment." Kant was, after all, a German Apollonian Romantic.

The same kind of paradox is echoed clearly in Windelband's treatment of the subject of logic. That was the intellectual disorder, the gap, the empty space which underlies belief in the existence of empty, Cartesian time.

In that strategic setting of the late Nineteenth Century, the intellectual impetus for Windelband's resurrection of Kantianism in the form of neo-Kantianism, was supplied by the counter-revolution against the science of such Alexander von Humboldt-associated Leibnizians as Lazare Carnot's and Gaspard Monge's Ecole Polytechnique, Carl Gauss, Wilhelm Weber, Lejeune Dirichlet, and Riemann.

During the late Nineteenth Century, the radically reductionist counter-revolutionaries in French and German science, against the Leibniz, Gauss, Riemann legacy, are typified by Cauchy, Clausius, Grassmann, Helmholtz, Hermite, Lindemann, and the anti-Riemann "neo-Hegelianisms" of Felix Klein, and by the Englishmen Kelvin and Maxwell. In this late-Nineteenth-Century setting in Germany, Windelband's response to the environment of that putative *Zeitgeist*, was the attempted defense of the notion of defending the relics

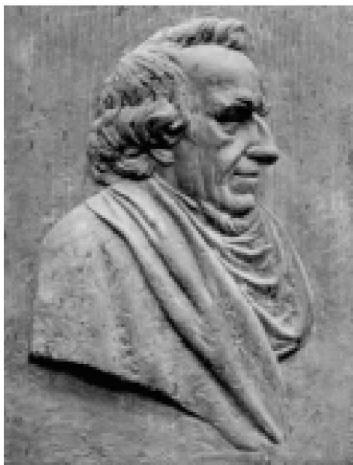


Benjamin Franklin's scientific networks in Europe, centered around Kästner, were the core of those battling the Leibniz-hating circles that included Voltaire, D'Alembert, Maupertuis, and Euler.

of Germany's Romantic past by presenting his own kind of modernist views of the late Nineteenth Century. The distinguishing feature of Windelband's approach, which makes him at least interesting today, is that he constructed his argument within the framework of his specific conception of a European culture rooted in the formative experiences of ancient Greece. Windelband employed the wrong key, but he was attempting to enter by the appropriate door.

The critical turn in Kant's own later career had come with the rise of that German Classical movement marked by the pair of collaborators, Moses (Dessau) Mendelssohn and the Gotthold Lessing, who reflected the influence of fellow-Saxon Kästner. While Lessing and Mendelssohn remained active intellectual figures in the Berlin setting, the launching of a Kant in his new, post-Hume, "critical" phase were not suited to the tenor of the times.

Kästner, for example, the figure standing behind Lessing, is best known as the most prolific teacher of mathematics during the middle to late years of his century, and one of the European co-sponsors of the political cause of the American scientist and political leader Benjamin Franklin. He was also at the center of the combat by Lessing and Mendelssohn against the corruption centered in the Leibniz-hating circles of Voltaire, D'Alembert, Maupertuis, Euler, and others,



EIRNS/Stephen Meyer



Adolf Kunike

As long as the intellectual giant Moses Mendelssohn (left) and Kästner's brilliant protégé Gotthold Lessing (right) were active in Berlin, Kant remained in the shadows. But with their passing, he ventured forth with renewed attacks on Leibniz, launching the kind of Romantic Gothic mysticism which has come to be known as German Critical Philosophy.

including Lagrange, then at the Berlin branch of a network of academies which had been organized on behalf of the pagan religious worship of black magic specialist Isaac Newton by the Paris-based Venetian Abbé Antonio Conti and the notorious Voltaire. The latter circle at Berlin, was the same circle of figures whose fraud against science was exposed by a famous student of Kästner and Zimmerman, Carl F. Gauss, in Gauss's celebrated 1799 doctoral dissertation on the subject of what was later named as the Fundamental Theorem of Algebra.¹¹

However, the most effectively devastating of the public attacks on the Newtonian hoaxsters of Berlin at that time, were the intellectual giant Moses Mendelssohn, and Kästner's brilliantly creative, and courageous protégé Gotthold Lessing. It was only as illness and death removed that pair, Mendelssohn and Lessing, from their earlier active collaboration on that Berlin scene, that Kant, a dedicated Romantic and ally of the Voltaireans of Berlin, dared to venture forth from a decade of cautious relative silence. His reappearance came, with his revised, neo-Aristotelean approach to attacks on the work of Leibniz, his famous series of *Critiques* which set the pace in his times for the specific kind of Romantic Gothic mysticism which had been known, since Kant's *Critiques*, as German Critical Philosophy.¹²

11. Carl F. Gauss, *Werke* III (Hildesheim: Georg Olms, 1981), pp. 1-31. The appended figure, on page 31, like the figures associated with the treatment of the subject of the *Pentagramma Mirificum* in III, pp. 481-490, and *Werke* VIII, pp. 101-117, is among the remarkable graphic type of events in the history of mathematical physics. [See **Figure 1**, and the Figures in the accompanying article by Bruce Director.] The latter selection bears directly upon Riemann's later development of the notion of hypergeometric functions.

12. The essential difference between the empiricism of Hume et al. and the "Critical" version of Cartesian empiricism by Kant and Hegel, is the Kantian

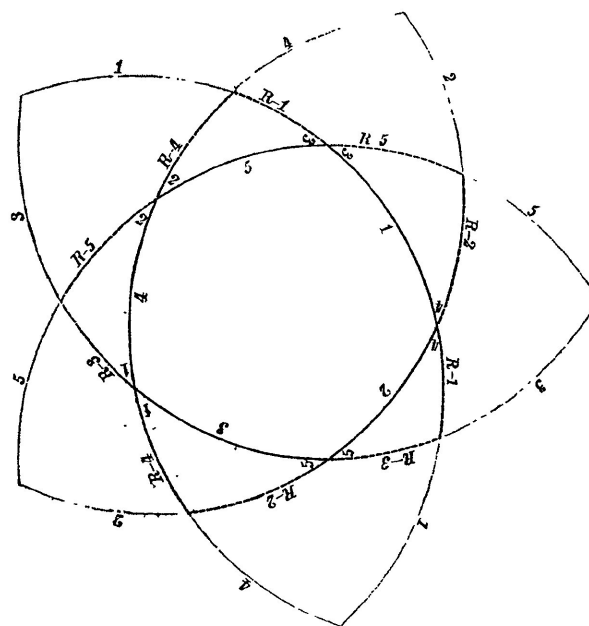
The Significance of This Study

The significance of Windelband's publications, as I studied these closely during the late 1940s, is their emphasis on debating the issues of those ancient roots of modern European philosophy which are located in ancient Greece. Wrestling with his works, from my standpoint as a Leibnizian on the way to becoming a promoter of the work of Riemann for the science of physical economy, was a pleasant and profitable intellectual wrestling match, especially against the background of my 1930s and early 1940s studies of the principal works of Immanuel Kant. It was by wrestling against such adversarial positions as Windelband's arguments, that my own deeper appreciation of the work of the Pythagoreans and Plato jelled into the form and degree of development which I realized, more and more, over subsequent decades.

In choosing to write this present report, I thought that a rising, new adult generation might gain from sampling some aspects of my own ex-

FIGURE 1

Gauss's Sketch of Napier's 'Pentagramma Mirificum'



resurrection of the Aristotelean "categories." The radical empiricists and their positivist cousins are still Aristotelean at heart, but their reproductive parts have been removed by "Occam's Razor," creating thus the passion for "end of history" doctrines such as those set forth in the later writings of Hegel.



Wilhelm Windelband: He had the wrong answer to the most crucial questions, but he focussed his attention on the right questions.

perience on that account. What are still the most important philosophical and related historical issues of the Eighteenth Century, are efficiently brought into the foreground by a view of the interaction of the opposing forces represented by the opposing roles of Kästner and Kant over the course of the Eighteenth Century, that with the symptomatic case of the later Windelband in view.

It became clear to me, then and ever since, from those and related studies of the 1940s and early 1950s, that no part of known European history can be competently assessed without taking approximately three thousand years of that history to date, into account, a history which must be considered as a unified, dynamic form of ongoing process. My intention here is to share an aspect of that experience: to share this, especially, with the generation of young adults who are now in the relevant phase of preparing to take charge of the history of the remainder of this present, young century.

1. The Background for the Issue of Logic

To wit: for the mass of those among today's victims sometimes called students, the customary approach to education in most relevant institutions today, is *from the bottom, up*, as from the indoctrination in the purely arbitrary assumption of a set of definitions, axioms, and postulates, whose adoption excludes, from that point of initial indoctrination on, all of the most crucial of the higher conceptions of physical geometry from the student's intellectual capabilities.

That *bottom, up* approach predetermines taught assumptions, as "from Euclid through Legendre," of the type which were crafted with the aim of eliminating the victim's attention to the most important issues of knowledge of the physical universe from the credulous believer's mind.¹³ It is important

13. Bernhard Riemann, "Über die Hypothesen, welche der Geometrie zu Grunde liegen" ("On the Hypotheses Which Lie at the Foundations of Geometry"), *Werke*, pp. 272-273 and following.

to recognize, that before the first known instance of a Euclidean geometry was put on record, the foundations of a competent geometry had already been developed by the Pythagoreans and others, without resort to what are regarded today as the standard classroom and related textbook assumptions of the subject.

To wit: In happier nooks and crannies of the history of known human cultures, the approach was from the top, down.

The working assumption must be, when taking into account the way physical science was introduced to ancient Greece from Egypt, that the crafting of the contrary, now customary, reductionist's definitions, axioms, and postulates,¹⁴ was done in the effort to destroy the student's knowledge of the anti-reductionist way in which the most significant features of ancient Greek physical geometry had been previously accomplished.

The fact that the most crucial of the known discoveries in physical science, of the Pythagoreans and Plato, among others of that time, were generated, from the *ante-Euclidean*, and implicitly *anti-Euclidean* vantage-point of the astrophysical conception of *Sphaerics*, points quickly to the fraudulent origins of the elementary notions underlying the usual classroom teaching of Euclidean geometry, and, therefore the related origins of the fraudulent, mechanistic view of physical-science matters, as now traditional among the followers of Descartes.¹⁵

The best of the ancient standpoints known to us from relevant surviving relics today, is what some loosely term astronomy, by which I mean that top-down approach known as the standpoint of *astrogation: the practice of transoceanic navigation by the stars*. To the best of present information available in public sources, knowledge of the latter, top, down approach was, like the prophet Moses, introduced to future history from Egypt, as introduced to the chosen best among the Mediterranean's relevant children of the Peoples of the Sea, the ancient Classical Greeks.¹⁶

14. I.e., bottom-up.

15. This also points to what is either the implicitly fraudulent, or merely bungling use of the term "pre-Socratic" Greek philosophy, when what should have been intended was "pre-Aristotelean" Greek knowledge. Most of the travesties passed down on the subject of Classical Greek philosophy have been tolerated solely with the fraudulent terms defined by the work of Platon-hater Aristotle. This kind of what is either simply foolish or intended falsification of even the reading of key technical terms of ancient Greek texts, has been assisted by imposing dictionary meanings of Classical Greek terms which could not be supported by re-enacting the actual process of argument employed by the texts to which those modern grammarians' hoaxes actually referred. Languages are used as the media for argument, but the ideas which notions of principle are intended to be conveyed by language, rather than some reductionist's choice of literal meanings imposed upon that text as such, represent the ideas which study must adduce. Take, for example, Plato's use of the crucial term *dynamis* in his *Theaetetus*.

16. Who, according to the Roman chronicler Diodoros Siculus, had acquired this knowledge from an Atlantic trans-oceanic culture, which had colonized a Berber region of Africa near the Atlas Mountains, and had spread its influence throughout the Mediterranean littoral, including ancient Egypt. This colonial view of the principal origins of ancient Greek culture, is the plausible conclu-

It was from the latter, from the top, down approach, that the best among the ancient Classical Greeks, such as Thales, the Pythagoreans, Heraclitus, and Plato, defined what stands out, still today, as the foundations for the only durably proven method of physical science. It was from this standpoint, implicitly, that of the stars of astrogation, that the only rigorous use of the term *universal* actually known to man, was developed, as by the relevant Egyptian and Greek founders of the preconditions for the later, modern European revival of the foundations of competent strains in modern science.

Competent scientific method always proceeds, in first approximation, downward, from universals, such as the principles of the universe adduced by means of the exemplary practice of astronomy by the Egyptian method known to the Classical Greeks as *Sphaerics*. Once we have assimilated that notion of universals, for which only a view from the conceptual vantage-point of ancient transoceanic astrogation affords us an intelligible set of imageries, we are prepared to continue that approach to the domain of the ever smaller, that, thus, beyond our powers of sensory perception. *We proceed, thus, from the universals of what appears to be the infinite, to the exploration of the domain of the universals of what appears to be the infinitesimal.*

Here, to the present day, precisely here, lies the pivotal issue of modern physical science, and science in general. The formal expression of that issue is the question: *Are infinitesimals of sense-perception the expression of an efficient form of existence, or, as the modern radical reductionists Euler, Lagrange, Cauchy, et al., argued, merely fictions? Do those apparent infinitesimals betray the existence of efficiently universal physical laws, in the sense that the universals of astrophysics are presumed to act, as efficient physical principles in their own right?* The Classical implications of that issue, as known to relevant ancient Greeks, and to the Renaissance's Nicholas of Cusa, were posed afresh for modern science by such avowed followers of Cusa as Luca Pacioli, Leonardo da Vinci, and Johannes Kepler.

The positive affirmation of the conception of the role of the infinitesimal, corresponds to that presented by Gottfried Leibniz's refined elaboration of the basis for the infinitesimal calculus, as the catenary-cued principle of universal physical least-action, the conception which provided the basis, in turn, for Gauss's physical conception of the complex domain, and for the higher physical hypergeometries of Bernhard Riemann.¹⁷

sion from study of the way in which fortified Mediterranean sea-coast sites were developed during the age of Mycenae and earlier. Herodotus indicates, from indicated Egyptian sources, that the Phoenician maritime tradition has a different, but parallel origin: the colonization, like the founding of Sumer, spread by a colonizing branch of the maritime culture from within the Dravidian language-group.

17. Students should trace this from Kepler's prescription of needed development of a physical calculus of the type produced by Leibniz. The crucial added point is the principle of "quickest time" provided by Fermat's famous experimental demonstration. The Leibniz calculus, which always took his

Indeed, Cusa's central position in the founding of modern experimental physical science, was, in a very significant part, a reflection of the Classical Greek sources made available to the circles which prepared and conducted the Fifteenth-Century great ecumenical Council of Florence.¹⁸ The methods of the Pythagoreans, Plato, and the continuation of that tradition by the influence of the Platonic Academy, typified by Eratosthenes, are the precedent for the founding of modern European science on those Platonic principles by that Fifteenth-Century, "Golden" Renaissance which produced

Unfortunately for the mass of those among today's victims sometimes called students, the customary approach to education in most relevant institutions today, is from the bottom, up. . . . In happier nooks and crannies of the history of known human cultures, the approach was from the top, down.

the first modern sovereign form of nation-state republics committed to the superior natural law of the promotion of the general welfare.

The concept of the general welfare, traced implicitly from Solon of Athens and the concept of *agapē* defined in Plato's *Republic*, is otherwise known as the same principle of *agapē* defined explicitly for Christianity by the Epistles of the Apostle Paul. It is otherwise known as *the principle of the common good*, in universal natural law, and is the pivotal principle of law set forth, as the "promote the general welfare," of the U.S. Federal Constitution.¹⁹ It is a law superior to the will of all governments, and their judges and other officials, as an out-

collaborator Huyghens' "quickest time" into account, progressed beyond the mistaken adoption of the cycloid as primary, to Leibniz's concluding definition of the principle of the infinitesimal calculus as a catenary-, rather than cycloid-referenced notion of universal physical least action, least action "in the best of all possible worlds," the world of Leibniz's, and the U.S. Declaration of Independence's universal principle of natural law, "the pursuit of happiness," which is otherwise known to be the fundamental law of the U.S.A. as the absolute obligation to promote the general welfare.

18. Typical is the fact that, although it was Nicholas of Cusa who presented the proof, that that mythical "Donation of Constantine" used to buttress the feudal system of medieval society under the tyranny of the Venetian financier-oligarchy and the Norman chivalry, had been a hoax, it was by Cusa's working through the relevant Byzantine Greek records that he developed the legal proof that the "Donation" doctrine had been a fraud from the inception, as Charlemagne had contended earlier.

19. Those of a less than patriotic conscience in the United States today, prefer the Preamble of the slaveholders' tyranny, as set forth in the Preamble of the Lord Palmerston's notable asset, the Confederate States of America. Notable, those who defend the Confederacy's argument on this point can not be members of the human race in good standing, since they reject Christianity, Judaism, and Islam, in favor of the dogmas systemically cohering with the "Darwinian" "theory of evolution."

growth of the founding of modern European civilization by that Council, and of the continuing effort, still today: *to free humanity from the satanic grip of usurious debt-slavery to the contemporary successors and political heirs of ultramontane, medieval Venice's imperial financier-oligarchy.*²⁰

The most crucial fact to be emphasized in treating the empiricists and their derivatives, including Kantianism and neo-Kantianism, is that, for them, as for the Newtonian followers of Descartes, D'Alembert, Euler, Lagrange, Cauchy, et al., even the existence of the infinitesimal must be forbidden, beyond what is assumed to be the hypothetical, *merely finite* limit which had been set for the calculus by Cauchy. That lunatic denial of reality, as by Cauchy, is the essence of what Kant and Kantianism share with the so-called Newtonians.²¹ The frauds, such as those of Descartes, D'Alembert, Euler, Lagrange, Cauchy, et al.,²² on the subject of the calculus, are maintained to the present day by all of the devotees of the Newtonians, most notably by those such followers of D'Alembert, Euler, Lagrange, et al., and Laplace, and Cauchy, as Clausius, Grassmann, Kelvin, Helmholtz, and Maxwell later. These frauds, invariably, take the form of the degree of outrageous silliness which I portrayed in some detail, a decade-and-a-half ago, in my attention to the subject of Euler's relevant argument on this issue.²³

This controversy of modern times was not wholly original. It was a reflection of the same controversy which divided the Pythagoreans and their co-thinkers from the reductionists of ancient Greece, such as the Eleatics, materialists, Sophists, and Aristotle. However, in this case, as otherwise, it is a truly universal law of nature, on which the greatest ancients, like Heraclitus and Plato, would agree, that history could never repeat itself, as I shall clarify that point of principle at appropriate points, as we proceed here.

"Silly" would be a fair description of the faulty behavior of the reductionists like Euler, which might be accepted among the otherwise literate as "physical science." The fact

20. I.e., through the superseding of Dante Alighieri's intention in his *De Monarchia* by Nicholas of Cusa's *dynamic* conception, as in *Concordantia Catholica*.

21. And also that crucial, radically reductionist feature of official Soviet *diamat* ideology which ultimately doomed the Soviet Union.

22. In some of these cases, we can not entirely exclude the possibility that the fanaticism of these hoaxsters is a reflection of arbitrary, religious-like belief, rather than reason. In the case of Cauchy, the discovery of proof, from his own personal archives, of his fraudulent suppression and plagiarism of crucial work by Abel, identifies Cauchy as a fully witting liar and thief.

23. 1990, as printed in Lyndon H. LaRouche, Jr., *The Science of Christian Economy* (Washington, D.C.: The Schiller Institute, 1991), Appendix XI: "Euler's Fallacies on the Subjects of Infinite Divisibility and Leibniz's Monad," pp. 407-425. The argument I supplied, against Euler, on that occasion, was prompted by an effort to rescue an associate who I recognized to be already in the process of slipping into fathomless intellectual darkness. My diagnosis proved clinically correct, but, so to speak, the patient was already as good as intellectually deceased. So, as it were said, cowards die a thousand times before their death; in such cases, it is the diagnosis which proves to have far greater importance for mankind than the subject who refuses to live.



Leonhard Euler. " 'Silly' would be a fair description of the faulty behavior of the reductionists like Euler, which might be accepted among the otherwise literate as 'physical science.' "

that the argument against the efficient existence of the ontologically infinitesimal, is silly, has not lessened the passion with which that silliness is aggressively defended by the modern Apollonians and Dionysians alike, as in the contemporary classroom and textbook, even today.

However, even agreement with the notion of the ontological actuality of both the infinite and infinitesimal, confronts us with a crucial kind of difficulty. Today's customary definition of physical science, as "physical," is usually understood badly, even among skilled physicists, and especially mere mathematicians. Strictly speaking, that definition is false. A competent form of a *purely physical* science, in today's conventional academic sense of the term, does not exist, neither in our universe, nor in imaginary universes other than our own.

As I shall point out now, that distinction is not merely "academic," not a mere academic sort of formality, but substantial.

Bridging 'Two Cultures'

The fraud of the ancient and modern reductionists which I have already referenced here, is the product of a combination of factors: e.g., political, philosophical, and religious. Since we are looking presently at that evidence from the vantage-point of the case referenced here, that of neo-Kantian Windelband, we can limit our attention to the role of what has been called a "two cultures" paradox, as a common symptom of the type of modern problem we are addressing under the heading of pathologies which are typi-

cal of modern logical systems.

This problematic feature of what I have identified so far as a conventional set of modern academic belief-systems, was usefully identified by the late C.P. Snow as a “two cultures” paradox: the mutual antipathy of physical and social science today. The true remedy for that destructive paradox still rampant in present-day academia, is to recognize what should be read as not merely the falseness of the assumption on which that corrosive dichotomy depends; but, rather, the hysteria which that false, and silly assumption bestirs, as a premise, within both of the respective, current, warring academic cultural traditions, still today.

For convenience, let us refer to this from the standpoint of an apparent paradox presented by Nicholas of Cusa, a paradox respecting the existence of discoverable universal physical principles, as posed by his founding work of modern physical science, his *De Docta Ignorantia: does a physical principle exist ontologically before mankind has discovered it?*

With closer, and more careful consideration of the principles of physical science than is customary today: science is the subject of our knowledge of the consequences of changes in *the effects of human social activity* prompted by the discoveries made by sovereign individual intellects. This knowledge is a subsidiary feature of what might be loosely identified as the empirically broader subject, the *social psychology* of the sovereign individual human mind. I mean the intentional efforts to change society’s functional relationship to the physical universe we inhabit, our willful awareness of the implications of our intention which prompts us to take that selected course of action.

The ability to predict, or, better said, forecast the physical outcome of man’s behavior, is a subject of a higher, more rigorous form of psychology, and of the *social psychology* of the sovereign individual mind. This idea of “predicting,” as is the presently customary intention expressed by the use of the word, implies a profoundly incompetent view of man’s role and capabilities within organization of the universe. At best, we can foresee certain important consequences of our decisions, or lack of decision. At best, we can foresee the nature of our obligation to warn our fellows, and to act ourselves in ways which correspond to the problem which we can foresee as probable, even almost certain. This point is illustrated by the awful moral and other failures of President George W. Bush, Jr. and his administration in the case of the almost inevitable effects of the threatening “Katrina.” The most essential function of forecasting, is to foresee the nature of our responsibility to change the outcome of the present for the better.

What morally defective, but commonplace belief today implies, is that the assumed outcome, the intention of the present action, is predetermined in the way the crystal-ball and tea-leaf hoaxsters propose, the way of Bernhard Mandeville, Adam Smith, and their ilk. Contrary to that commonplace misbelief, what is always certain, is our personal responsibility to act to the effect of shaping the future in the manner

stated by the relevant verses of *Genesis 1* on the subject of man’s nature and duties.

All attempted prediction, or forecast, of social phenomena, such as economic developments, is essentially, as I shall explain this within this report, a subject of what might be termed *the science of physical psychology: mankind’s relative power of mind within, and over, what is regarded as the physical universe*. Therefore, we must think of physical psychology as the kernel of *the social psychology* of the truly sane individual mind.

This term “social psychology,” depends for its competent practical definition upon insight into the kind of relations between nature and mankind which Leibniz, for example, defines as *dynamic*, that in opposition to the popular, modern philosophical liberal’s misconception of the universe as mechanical, as in the method of Descartes and his Anglo-Dutch Liberal and other “Enlightenment” followers. This is the same sense of “dynamic” expressed by Russian scientist V.I. Vernadsky in his, already referenced, 1935-1936 definition of the work on the branch of physical science which he named biogeochemistry.

The corollary point, is that the prevalent ideas about economy today, especially among the members of a “Baby Boomer” generation, is that there is a categorical, mechanistic separation of merely “arranging things,” from the dynamical view of the determining function of those physical changes in economic practice which are the act of actually “doing things.” The more popular ideas about political-economy, especially among those duped into belief in a “service economy,” are those imageries in which what passes for economic policy is a focus on arranging people, their sexual and other social relations, and their opinions about almost everything. This is simply carrying to an extreme what C.P. Snow named a “two cultures” syndrome.

In the teaching of professional and popular opinion about the workings of political-economy today, this pathetic dichotomy between “social” and “physical,” takes the form of the variously stated, or implied doctrine, that management of the political-economy is a matter of social processes which must be defined in a way which is independent of the physical-scientific implications of productivity of the economy considered as an integrated whole process. This denies the essential fact, the fact which distinguishes man from mere ape, that it is the application of an ongoing process of employing discoveries of universal physical principles, which is the only possible source of sustained profit, without which any society is plunged, sooner or later, into a “dynastic collapse” of the system, such as a “new dark age.”

That is, implicitly, another way of saying, now once again, that the action of the human mind on the universe, to the degree it is efficient, is not a *mechanistic* form of action; it is essentially, ontologically, *dynamic*. It is dynamic in that specific sense that Leibniz demonstrates the absurdity of Descartes’s systemically mechanistic view of momentum.

If we define the sovereign identity of the individual mind,



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"To understand the human mind, we must know that we must despise, with extreme prejudice, the existentialist notion of 'thrownness' in the doctrine of Hannah Arendt's sometimes beloved, Nazi co-thinker and active anti-Semite Martin Heidegger."

that which distinguish man from the apes, as the function of the cognitive creative powers, the efficient function of those cognitive powers is what is expressed as the ongoing, *dynamic* interaction among members of society, and in respect to society's relationship to the Biosphere.

To understand the human mind, we must know that we must despise, with extreme prejudice, the existentialist notion of "thrownness" in the doctrine of Hannah Arendt's sometimes beloved, Nazi co-thinker and active anti-Semite Martin Heidegger.²⁴ The essential relationship among the minds of the members of society, is regarded by the existentialists as axiomatically mechanistic, rather than dynamic. The denial of the existence of truth, even her hatred of the idea of truth, is her explicit contribution to the existentialism which she shared, to the apparent end of her life, with her sometime intimate, Heidegger.

The creative processes of the individual mind are sovereignly independent, that in a sense cohering with Riemann's argument for Dirichlet's Principle, a conception coherent with the special meaning which Riemann had earlier assigned to Herbart's *Geistesmasse*.²⁵ The "boundary" which sets the creative powers of the personality apart from the Romantics' customary ideological "night in which all cows are black," is a boundary of the form associated with Riemann's notion of the application of Dirichlet's Principle to the physical charac-

24. A pair whose intellectual union was separated, in the end, by little more than the thin, slightly penetrated sheet of her official birth certificate, as "Jewish." Her hatred of truth was infamously codified, in cooperation with her culturally degenerated accomplice Adorno, in that pair's echo of fascist dogma, set forth on the subject of the alleged "authoritarian personality," on behalf of that synarchistic, implicitly satanical collation of scoundrels known as the Congress for Cultural Freedom. The essential, underlying quality of that doctrine, is traced most efficiently to the Thomas Hobbes recognized widely in and following his time as the incarnation of "Old Hob."

25. Riemann, "Zur Psychologie und Metaphysik," *Werke*, pp. 509-523.

ter of social processes which are functionally dynamic systems.

To wit:

Take the example of ideological systems. In the latter cases, the internal functioning of the individual mind of the inhabitant of that ideological custom, is bounded, as if externally, by a set of virtual walls, with the affect of a marine creature swimming within an aquarium which is sitting, itself, within a larger body of water. Yet, the arms, legs, and sensory organs, so to speak, of the captive creature, are interacting within the universe outside those walls. The resulting interaction between the real laws of the universe and the mind of the creature trapped within the aquarium, can be understood scientifically only in terms of treating the social relationship of the captive's mind, as organized in this way, to the implied "mind" corresponding to the principles of the universe outside.

Thus, the relationship between the mind inside, and the social processes operating in the world outside that sovereign individual mind, is *dynamic* in character, yet once again, as I have emphasized this notion of "dynamic" in my "Vernadsky and Dirichlet's Principle."²⁶

True physical science, once freed from the popular lunacies among today's academic life, is not based on the study of nature apart from mankind, or social behavior apart from the adducible physical laws of nature. It is the study of the principled characteristics of mankind's discovery and proof of those universal principles of practice, by means of which man increases his mastery of nature. It is this functional relationship between the socialized cognitive powers of the individual, within his or her culture, and the effort of not only the individual, but of society, that increases mankind's power in and over nature through the application of discovered principles of universalizing qualities of human activity.

For example, consider the qualitative upshift in European demographics launched by the great reforms of the Fifteenth-Century Renaissance. Focus also, on the way in which these benefits are shown following the close of the 1492-1648 wave of religious warfare. Focus on the more recent, not unproblematic shifts in demographics of the planet as a whole, with the waning of the depressive effects of colonialism under conditions of technological progress in large regions of Asia.

A Typical Impact of the U.S.A.

It was the change in organization of society, through the introduction of that principle of the sovereign state which was based on submission to the principle of the general welfare, which defined a change in the principled features of social organization, a change which was essential for the unleashing of the potential for improvement of the condition

26. Lyndon H. LaRouche, Jr. "Vernadsky and Dirichlet's Principle," *EIR*, June 3, 2005.

of mankind, otherwise a potential effect of scientific and technological progress.

The rapid transformation of the U.S.A., according to the plan for national borders and objectives crystallized under Secretary of State John Quincy Adams, toward becoming the leading nation on this planet, was made possible by the victory of the republic, led by President Abraham Lincoln, over the virtually feudal depravity of the London-directed Confederate conspiracy. We took large margins of the poor of Europe, en masse, into the U.S.A., where they accomplished miracles of progress which would have been impossible to achieve had those immigrants remained in Europe.

For example, the very existence of the Biosphere and Noösphere, as experimental science has proven this existence, is sufficient, conclusive proof of the absurdity of Kant and all of the general class of his fellow reductionists. The fact that man has discovered such principles, as powers lurking within the domain of the truly infinitesimal, which the empiricists and their Kantian and other illegitimate offspring foolishly, but hysterically deny as actually existing, is sufficient, crucial experimental proof of the absurdity of the lot of such reductionist ideologues. As I have said earlier here, and in other locations, V.I. Vernadsky summed up the evidence, in his 1935-1936 directive on the subject of biogeochemistry, that the universe is intrinsically dynamic in its organization (e.g., Keplerian, Leibnizian, Riemannian), not the falsely assumed mechanical universe of Descartes et al.²⁷

The problem posed, typically, by both Kant and neo-Kantianism, is the exclusion of the existence of actual universal physical principles, as that exclusion is prescribed under Kant's lunatic dictum respecting "synthetic knowledge *a priori*." Thus, by declaring, as a true psychotic might, the non-existence of discoverable universal principles, the Kantian in particular, and the reductionists in general, prohibit the very subject-matter upon which the competent practice of science, *as naturally lawful social practice*, depends, as all Apollonians and their Dionysian foster-children perpetrate this specific error.

The essential subject of a required science of physical psychology, is *irreversible changes in the historically defined physical domain*. These effects are not absolutely irreversible in the simpler sense of the matter; in a certain manner of speaking, *we can reverse what has been done before; but, contrary to the Romantics' views on the subject of Classical tragedy, we can not reverse the social process, even by the relevant brutal methods of indoctrination used on victims in places such as the Guantanamo prison, or, as the triumph of the cause of martyred Jeanne d'Arc over the Norman inquisition in France shows, or the similar imitations of the methods of the rabidly anti-Semitic Grand Inquisitor Tomás de Torquemada, the reality of the fact that what has occurred in*

27. *Ibid.*

*history, or individual experience, has occurred.*²⁸

The primary type of such change which must be at the center of our attention, is a change in the physical principles operating in the domain of experienced practice: such as the spread of knowledge of, and socialized use of an experimentally validatable, discovered universal physical principle. *It is this conception of change as ontologically primary*, as echoing the intention of Heraclitus, as Plato supported that intention in his *Parmenides* dialogue, which is the central issue before us now. It is the central issue illustrated by my references to the historical existence of the changes in history expressed by the personalities of Witte and Windelband, on the one hand, or, Leibniz, Kästner, Kant, and Schiller, on the other.

It is all a matter of the concept of *universals*, as the best principles of European science are implicitly found in mankind's experience of the challenge of transoceanic experience with astrogation, as that experience is embedded in the characteristics of the Egyptian principles of *Sphaerics*, adopted by the best among the ancient Classical Greeks.

Some Illustrations of the Point

For purposes of classroom illustration, one of the most efficient choices of starting-point for illustrations of the point about universals which I am presenting in this report, is the example of the measurement, about 200 B.C., to a relatively high degree of accuracy, of the circumference of the Earth (along a South-North longitude) by a member of the Platonic Academy, Eratosthenes. This was done by what we might describe simply, for pedagogical purposes here, by measuring the difference in the angle of the shadows cast by a pair of upright (as, by plumb bob) poles at two points along a South-North direction: one at a place in the vicinity of Egypt's Aswan Dam today (Syene), and another in Alexandria. The difference in angles cast by the shadows at noontime, during the Summer solstice, defined the rate of change by curvature along the longitudinal distance between the two points. [See **Figure 2.**]

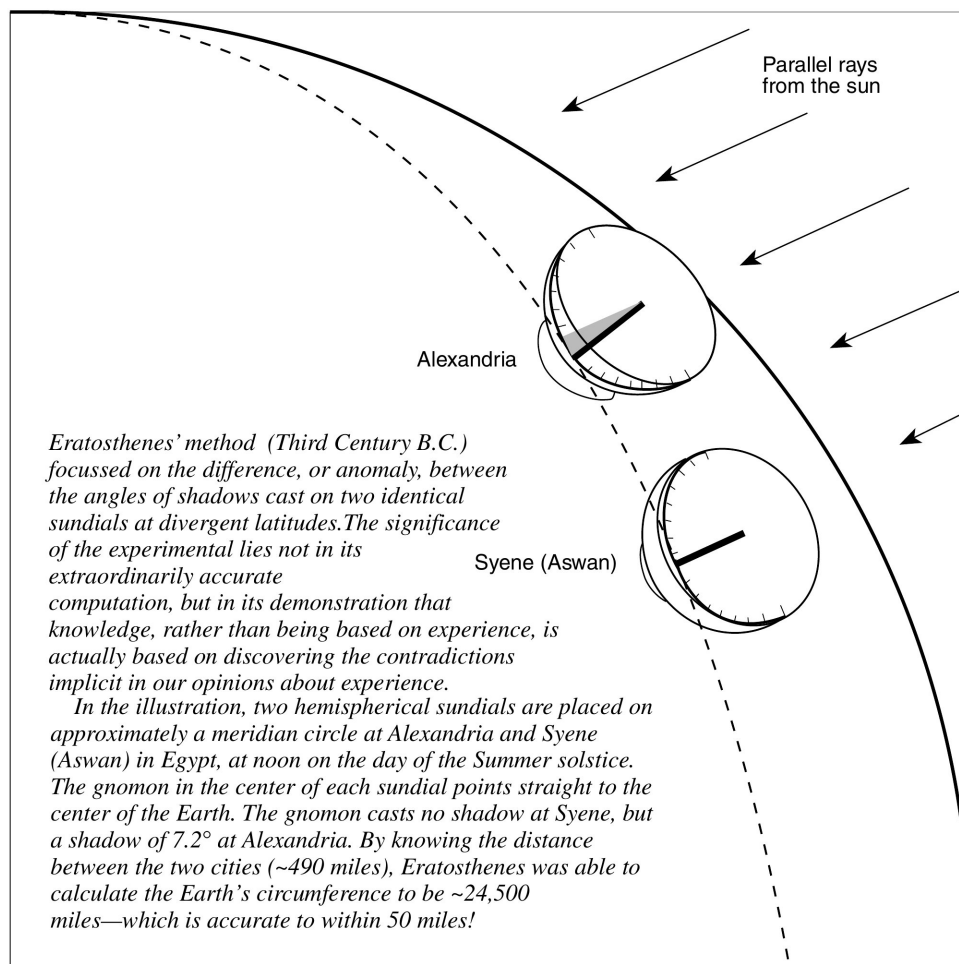
Since the curvature of the Earth was known to the more ancient Greeks (for example) through the study of eclipses of the Sun and Moon,²⁹ and Aristarchus' measures of the Summer solstice and related matters, Eratosthenes, a product of Cyrenaic ancestry, trained in Athens, who was the leading scientist based in Egypt, and a correspondent of Archimedes of Syracuse of that time, was rather fully informed on these

28. For example, when we draw down the resources we extract, as by mining, from the Biosphere, we are undoing what was done by the Biosphere before, but we have retained, *dynamically*, in newly developed form, that which we have thus undone.

29. For example, the proof of the Earth's orbiting of the Sun as supplied by the astronomer Aristarchus circa 280 B.C. Cf. Sir Thomas Heath, *Aristarchus of Samos: The Ancient Copernicus* (New York: Dover Publications, Inc., 1981). The Roman Claudius Ptolemy was a willful hoaxster.

FIGURE 2

Eratosthenes' Method of Measuring the Size of the Earth



preliminary matters bearing on his investigations; the approximately spherical curvature of the Earth was well established. The measurement of the rate of curvature of the arc along the length of the distance between the two points, therefore supplied the estimate of the size of the Earth later used by Nicholas of Cusa's friend Toscanelli in crafting the estimated map of the Earth which he supplied to his correspondent Christopher Columbus [Figure 3].³⁰

The most important discoveries made next, following

30. For example, Cusa knew of and reported the Earth's orbiting the Sun before the work of Copernicus, Brahe, and Cusa's avowed follower Johannes Kepler. The error in Toscanelli's map, in placing the coast of China at what was actually the coast of North America, was the result of typically Venetian lies, as by Marco Polo et al., in greatly exaggerating the distance and perils of the journey from Venice to China. Columbus's confidence in the first voyage almost certainly reflected his knowledge of the North Atlantic oceanic currents, even before the Portuguese recognized the kindred ironies of the South Atlantic.

those by Leonardo da Vinci, were by Johannes Kepler, whose work defined the context within which Fermat's crucial experimental discovery of the principle of quickest time occurred. The work of Huyghens, and the first, mid-Seventeenth-Century astronomical measurement of the speed of light to a fair degree of accuracy, by a student of Huyghens, and the plethora of fundamental and related discoveries in many fields of physical science, and others, have, as Albert Einstein came to recognize, typified the actual progress of science, as by Gottfried Leibniz and Bernhard Riemann, from the time of Kepler's death through the present day.

A crucial modern discovery by Leibniz involved his attack on the fallacy perpetrated by René Descartes's incompetent description of momentum. Leibniz's meticulously crafted argument, exposing Descartes's fallacy, is valuable not only because of this contribution by Leibniz in defining an essential principle of any competent mathematical physics.

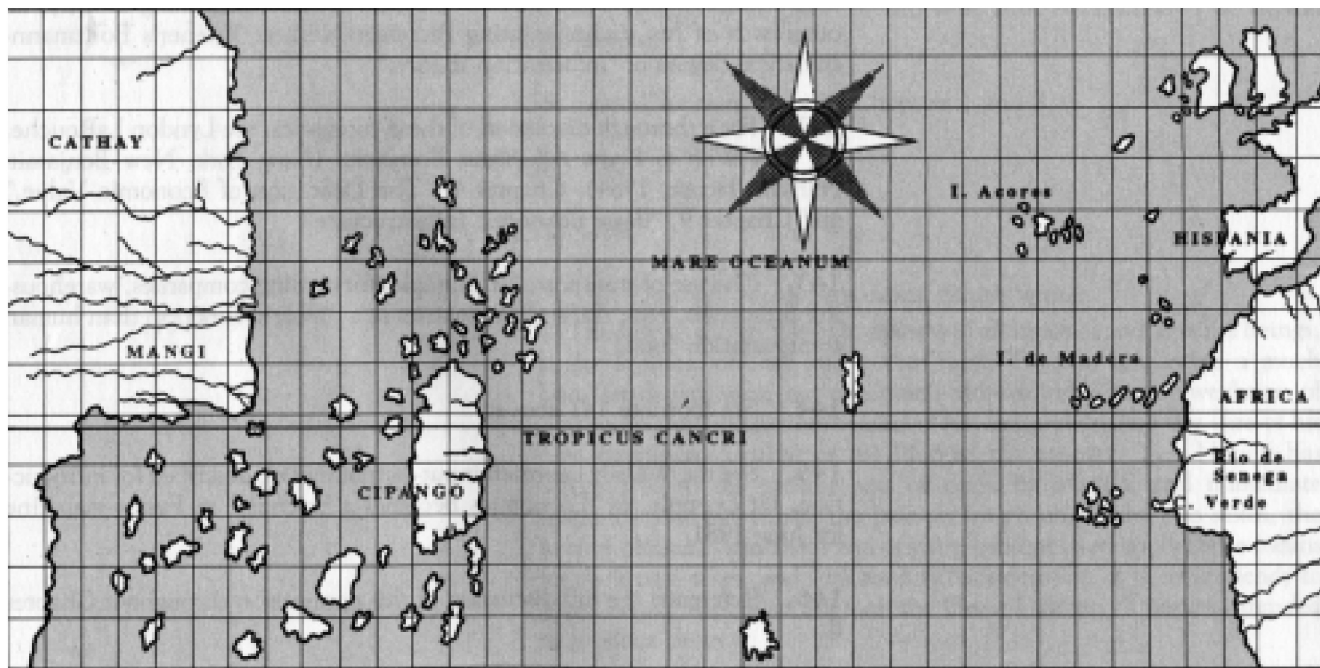
This proof by Leibniz includes

the even more essential demonstration of Descartes's blundering incompetence, on this and related subject-matters; it brings to light a much deeper principle, that the physical universe, including economic processes, is governed by dynamical, rather than mechanistic principles. Leibniz's adoption of the term *dynamics* for this occasion, as this is central to his definition of a science of physical economy, was a direct, intentionally translucent borrowing of the concept of *dynamis* from the Classical Greek of the Pythagoreans, as by Plato.

This affirmation, by Leibniz, of the Classical notion of dynamics, became the principal dividing-line within the ranks of nominal physical and related science from that time to the present. Notable is the role of the Venetian, Abbé Antonio Conti, operating from Paris, who was the leader until his death in the middle of the Eighteenth Century (1749), in apotheosizing the synthetic, anti-Leibniz cult of black-magic specialist Isaac Newton. Conti was the key organizer from Paris, together with Voltaire, of the network of so-called "Newton-

FIGURE 3

Paolo dal Pozzo Toscanelli's Map, Sent to Columbus



ian,” anti-Leibniz cult-centers throughout Europe. All of the essential dividing-lines within what is called European physical science since that time, have been based on the division of the ranks between the adherents of the *mechanistic* dogma of Descartes and the *dynamic* comprehension of reality by the followers of Cusa, Leonardo, Kepler, Fermat, Leibniz, Kästner, Gauss, Carnot, Gauss, Dirichlet, Riemann, et al.

This division in the ranks of what is usually identified as modern science, is an echo of the division between the *dynamic* current associated, on the one side, with Thales, Heraclitus, the Pythagoreans, Solon, Plato, and his followers, and the various, *pro-mechanistic* brands in known European cultures spawned, chiefly, by the Delphi cult of Apollo, including the Apollo cult’s burial and subsequent adoption of the alleged orphan on its doorstep, the nasty, Python-like Dionysos.

The Idea of Global Sea-Change

To begin the pivotal core of the argument assigned to this chapter of this report, take the observations presented by Bal Gangadhar Tilak, in his *Arctic Home in the Vedas*, who pointed to evidence akin to that he had presented earlier in his *Orion*, which, in fact, showed a knowledge of a magnetic-polar cycle in the relevant ancient culture. Such information, and the conclusions which relevant European scientists and scholars had drawn from it, had been used, sometimes, to support some cultish constructs; but, among sounder minds, this led to thoroughly sensible conclusions, once the relevant,

shifting geographic patterns under prolonged glaciation were taken into account [Figure 4]. How, when, and where could mankind have prospered, relatively speaking, under such conditions?

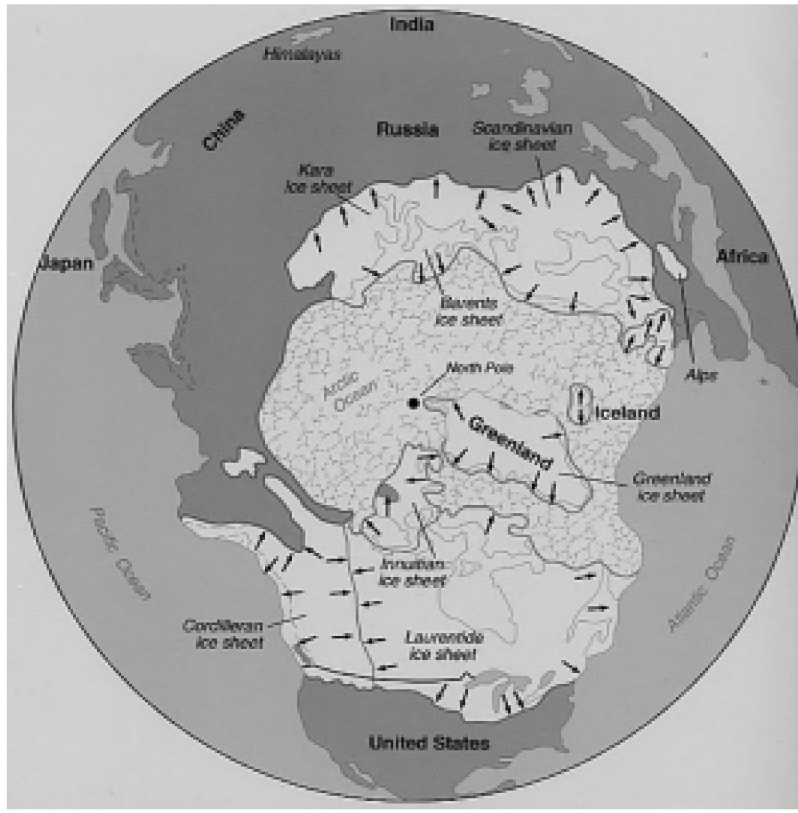
When we think clearly, we can not accept the wildly conjectural, arbitrary assumption, that the main currents of development of human culture had flowed downstream, from deep inland, along riparian pathways, into the lakes, seas, and oceans. The simple mode of potential food-supply implies the reverse: that the superior quality of sustainable lines of development of cultures, had run in directions contrary to the British Biblical archeologist’s “history began in Mesopotamia” model.

Take as a matter of illustration, the importance of the orientation of the function of major river-systems as links between the deep inland headwaters and transoceanic and related commerce. Does economy flow from the headwaters, or, as in a truthful understanding of this imagery, is it global maritime traffic which spreads the influence of its existence upstream? When we pinpoint the factor of marginal physical gain whose existence depends upon the existence of functioning maritime commerce, sane people are impelled to recognize the truth. *Development is an effect which is spread upstream!*

To similar effect, look at this subject-matter from the vantage-point of the truth buried within the cultish fantasies of a British geography teacher, Halford Mackinder, the cult

FIGURE 4

Extent of Glaciation During the Most Recent Ice Age



Source: <http://shiro.wustl.edu>.

of *geopolitics*. Despite the deadly lunacies embedded within the elaboration of Mackinder's work by Karl Haushofer, et al., these fellows were describing something whose actual scientific roots went much deeper than their shallow minds could plumb. The better view of what became known as "geopolitics," was rooted in biological images, rather than simple, commercial thinking about geography.

The fact which must be rightly reassessed, in studying the implications of the concept of geopolitics, is that the history of known political and quasi-political expressions of civilization demonstrates, that, *until the global impact, during and after the U.S. Civil War, of the change of direction which has been set into motion by the impact of the U.S. development of the transcontinental railway system*, the most durable currents of social-political-economic development of known civilization, from the known most ancient, into modern times, had been "genetic"-like expressions, or reflections of maritime, rather than land-based processes of leading cultural development. The way in which European civilizations developed under the leading impact of maritime (e.g., "Peoples of the Sea") cultures, reflects the way in which economic development flows upstream—against the stream—along downstream routes. In ancient into modern terms, this was literally

upstream. Since the cumulative effects of what was set into motion by the Fifteenth-Century Golden Renaissance, technological development has superseded, but not eliminated upstream riparian development as the leading force in shaping the flow of history. So, often, the future determines the present, especially in matters whose flow, along channels of the Noösphere, is energized by the creative mental powers unique to man.

This is the underlying implication, the underlying reality, expressed by the psychosistending obsessions of the modern term "geopolitics."

The terrible failure for future generations, of the essentially destructive, plague-like explosion which the predator Genghis Khan set into motion, as his contribution to what was otherwise expressed by Europe's Fourteenth-Century "New Dark Age," illustrates the point. The significance of the long wave of domination of Europe by medieval Venice and its Anglo-Dutch Liberal offshoots, is a phenomenon of similar relevance. The key is not merely that the intersection of water-borne maritime and riparian commerce has created, until recently, what was, unquestionably, the most effective, most efficient catalyst of the role of maritime power since times prior to the historical "Peoples of the Sea," into modern times. The key is a category of ideas which exists outside the bounds of the intellects of

Kant and the neo-Kantians.

As I have emphasized above, the first significant break in a pattern which has prevailed since deep into the last Ice Age, came with the development of the railroad during the Nineteenth Century. It was not the development of railway systems as such, which defined the qualitative change in world history this unleashed. *It was the orientation toward transcontinental railway systems, as typified by the work of then U.S. citizen Frederick List inside the U.S.A.* The impetus for this role of rail came from within earlier developments within the U.S.A. itself, as the case was defined by professional historian H. Graham Lowry, in his 1988 *How the Nation Was Won*.³¹ That impetus behind that commitment to the development of transcontinental rail systems, was copied in Germany, D.I. Mendeleyev's Russia, and elsewhere, is a story of great relevance for the setting which the case of neo-Kantian Windelband expresses.

It was understood from early during the Seventeenth-Century beginnings of the colonization of North America, that the security of these colonies depended upon a continental

31. H. Graham Lowry, *How the Nation Was Won: America's Untold Story, Vol. I 1630-1754* (Washington, D.C.: EIR, 1988).

development-process. This was the basis for constant efforts at cooperation with an extremely thin population of relatively indigenous peoples of the continent, an attempt at cooperation which was aborted repeatedly through the fostering of so-called “Indian wars” against the colonists by sundry Jesuit, other French, and also English adversaries of the development of the English-speaking colonies. The outcome of this was the policy consolidated in U.S. diplomacy under then Secretary of State John Quincy Adams, which defined the natural borders of the United States to be Canada on the North and Mexico on the South, and the Atlantic and Pacific oceans, east to west. The settlement of this relatively vast territory, therefore required efficient mass-transportation systems for people and freight. The Great Lakes and Mississippi River systems, were the area of initial emphasis; the development of the transcontinental railway system was decisive.

This development of transcontinental railway systems, such as the pre-1898 French, trans-Africa line from Dakar to Djibouti, and Kitchener’s ending that French project at Fashoda, illustrates the point, as do the German project for a Berlin-Baghdad railway, and the actuality of the development of Russia’s Trans-Siberian railway through, in part, cooperation with China.

It was this emergence of transcontinental and related railway systems, which challenged the absolute monopoly of hegemonic strategic power which maritime culture had enjoyed since times of the Peoples of the Sea, a maritime culture which was thus enabled to outflank, strategically, the military and economic power represented by the sheer mass of forces represented within the land mass.

It was the victory, led by U.S. President Abraham Lincoln, over the Confederate pawns of imperial Britain’s Lord Palmerston and his puppet Napoleon III of France, which changed the world, by shifting strategic power away from imperialistic systems based upon so-called sea-power, to the unleashing of the internal economic potential of the interior of the land-mass. That was the effect of the development of transcontinental railway systems and their regional and local extensions. That will be magnified enormously by the development of magnetic-levitation systems as superseding friction rail.

This were strongly implied to any thinking physical economist, when we take into account not only density of potential, harvestable food-supplies, but the development of agriculture through circulation of seeds and the like. All in all, the potential for a durable form of proto-urban-centered cultural development under the relevant adverse conditions associated with prolonged glaciation, points to the maritime culture as the more durable choice of those times: from the standpoint of consideration of successful modalities for multi-generational development. The known pre-history and history of the region of the Mediterranean, and the relevant, dominant role of maritime culture, is a case in point.

If we can accept the existence of mid-glacial cultures with the included attribution of magnetic-pole cycles, that represents the discovery of a crucial fact which would disprove

fundamentally certain contrary, popular assumptions which must be discounted, in any case, for reason of their specifically cultish lack of regard for scientifically credible evidence.

It is the increase of potential relative population-density through scientific and related cultural development, which generates those marginal increments in expressed physical power of the individual human mind, from which human progress always flows upstream in one sense or another.

Change As Universal

However, more significant than even such evidence of ancient knowledge of cycles corresponding to those of the magnetic North Pole would be, we are on far more certain ground when we reflect on the implications of principles of Sphaerics.

On this account, competent physical science is more than a two-way street.

Physical science is, on the one hand, the pathway *in mental life* through which mankind’s power over nature is accomplished. On the other hand, it defines the way in which the individual human mind must operate, and be developed, if mankind were to have survived, as mankind, in the circumstances of the Earth during the opportunities presented by the recent two millions years or so. It also points out those principles of social relations among sovereign individual intellects, on which a culture, composed of such individuals, must be organized, to produce the viable forms, and development of cultures, on which the potential for survival and progressive development of the quality of the individual member depends.

It is the dynamic, as opposed to mechanistic method for assessing this set of physically efficient forms of development of social relations, which provides us an insight into the universal implications of the relationship among Greeks and Egyptians as defined by the evidence inherently lodged within the practice of *Sphaerics*. That is the point of reference on which the generating principle of this present report hangs. That point of reference is fairly summed up under the title of “the principle of change,” as Plato emphasizes this in such included locations as his *Parmenides* dialogue.

Start the relevant systematic argument as follows.

Consider the implications of the adoption of the Pythagorean method, the method named, not as “geometry,” but *Sphaerics*, a name for what was, in fact, the navigational science of astrophysics. To summarize certain principled conclusions, respecting scientific method, which were adduced from the experience of Sphaerics, they did not employ anything like the so-called “Euclidean” assumptions of a mistaken, virtually Babylonian, notion of geometry, as plane and solid. There were no “self-evident” definitions, with attached strings of attended axioms and postulates. *Sphaerics was not a non-Euclidean geometry, but, on the functional scale of progress in scientific development from superstition to knowledge, an anti-Euclidean geometry in the direction of Riemannian hypergeometries.* The principles employed for the

pupils' introduction to physical science were, essentially, that no line can be generated by a point, no surface by a line, and no solid by a surface. Nothing important exists, or can be created, without the *power, dynamis*, of principled physical action.³²

I repeat a crucial point: The latter point is known by them as the concept of *dynamis*, as referenced by Plato, which Leibniz translated as *dynamics*. That term is translated into English as the principle of *power*, which is the English translation of Leibniz's use of the German term *Kraft*. The ability to generate higher orders was defined as a *power*, and thus implicitly *a function of physical action of change of state*, defining, thus, a physical geometry rather than a nominal one.

To double a square by construction, rather than algebra, expressed a power. To double a cube, as the Pythagorean Archytas did, expressed a power. The construction of the dodecahedron expressed a power. Carl Gauss's construction for the *Pentagramma mirificum*, is another such instance of the same case.³³ These powers, illustrated by constructive geometry, implicitly define an action between or among the states represented as end-points, fore and aft. This is the significance of Plato's view on the subject of Heraclitus' "nothing is constant but change."

These several bare principles were not a primary foundation on which science was to be constructed, but a warning against the errors which would ruin attempts to understand the lessons which the universe, as represented by astrophysics, is attempting to teach us. The concept of change *per se*, is primary. Thus, for those such as the Pythagoreans, mathematics existed only as a hod-carrier of the experimental physics—Gauss's "queen of the sciences," the essential companion of physical science—of crucial universal anomalies in a *physically* efficient universality subsumed by experimental astrophysics. The mathematics determined by physical science, rather than *a priori* ideologies, was *a principle of physically efficient change of state*. This is the view of the Pythagoreans, as presented to us by Plato.

This power, uniquely specific to the human social individual, among all living species, is the most crucial proof of the special nature of mankind, in contrast to all other living species. This is the basis in fact for the concept of the Noösphere.

What we have, therefore, is the precautionary requirement of measuring what we observe as within a continuous univer-

32. The way in which the science of Egypt was crafted to correspond to the relationship between two crucial stars, is an example of this principle. From the standpoint of the history of a validatable mode of universal physical science, the idea of "geometry" itself is false to science, when we recognize the implications of the practical difference between "top, down" (Sphaerics) and the "bottom feeders" emphasized by the devotees of the "it began in Mesopotamia" cult, which is represented by standard elementary classroom and textbook instruction in geometry today; even up to the nominally highest-ranking levels in the science community today!

33. See note 11.

sal spherical organization of observed charges in the observed universe "above." That informs us, only, of the way in which we agree to be sociable, which is to correlate our observations and measurements according to this common way of referring to what we have observed, and are observing. That principle is demonstrated, with a vengeance, by the approach to astronomy taken by Kepler and Gauss, most emphatically.

One does not need to be a professional astronomer to know this; it is sufficient to be able to think, although, as serious students might protest, such thinking for such purposes may, admittedly, take a bit of work.

The conceptions which conform to that standard derived from such views of astrophysics are called *universals*. That is the restricted significance we must employ for use of the terms *universe* and *universals*, such as *universal physical principles*. That should be what we mean to say when we say *universal principles*. It is only conceptions which meet the standard of proof for universal physical principles which competent people identify as principles of physics, law, or anything else. Anything less than that, are to be regarded merely as yet-to-be-proven mere generalizations.

This brings us, again, to the matter of Heraclitus.

We know, painfully, little about Heraclitus beyond the implications which can be adduced with certainty from Plato's treatment of the notion of a universal principle of change, as the primary real mode of existence in our universe; but, by implication, as I shall now explain, that little is a lot.

2. The Mind of Heraclitus Views the Stars

To acknowledge the relevant formalities of the matter, Russia's Academician Vladimir Ivanovich Vernadsky (1863-1945), Academician of both Russia's Imperial Academy, and, later, also, the Soviet Academy, is a world-historical figure, who is to be viewed, from what is known today, as of approximately the historical rank of his sometime teacher and predecessor Dmitri Ivanovich Mendeleev (1834-1907).³⁴

34. "Vernadsky and Dirichlet's Principle" (see note 26). Today, we have better insight into the intellectual relationship between these two Titans of modern science. As an offshoot of a presentation which I delivered, now about two decades ago, under the auspices of our Fusion Energy Foundation, our collaborator Professor Robert Moon was prompted to revive work on an important revision of Mendeleev's Periodic Table which Moon had taken up, provisionally, years earlier—on the issue of the essential, irrational arbitrariness of the doctrine of the "magic numbers." This work was interrupted and halted by Professor's Moon's death in 1989, but finding those qualified to continue that promising line of investigation, has remained on my agenda to the present instant of writing. Mendeleev was, therefore, clearly on the trail of the cosmic implications of the study of the physical history of isotopes, as Moon had recognized. Therefore, the 1935 views of Vernadsky on this subject of physical chemistry, as expressed in that referenced location, show the essential continuity of that line of work of the two historical figures of modern science. The need to continue this line of the work of Professor

Vernadsky's successive achievements in defining, first, the Biosphere, and, then, applying the same method to define the Noösphere, have given us, not one, but two ways of defining science's indispensable notion of universality. First, there were the starry heavens as known, in principle, to relevant ancient transoceanic navigators, whoever these ancients might have been. Now, as a benefit of the work of Vernadsky, we have a more Earthly basis, in the universality shown on our planet itself, in the evidence of what Vernadsky defined as the Noösphere.

Later in this chapter, I shall restate that specific case, as I have in earlier published locations, such as "Vernadsky and Dirichlet's Principle." First, I shall now proceed to situate the issue historically.

The significance of that fact which I have just cited here, is twofold. First, on the surface of the matter before us, we have the existence of two primary empirical sources, astrophysics and the Noösphere, rather than one, for a rigorous concept of scientific universality. This strengthens our insight into each of these reciprocal ways of defining the essential meaning of science as such. Second, it supplies the basis for empirical proofs which demonstrate the efficiency of the creative individual human intellect, and its social expression, and demonstrates that more forcibly than were otherwise accessible to scientific inquiry today.

However, in choosing between the two cases as the starting-point for our argument here, the following, compelling consideration of scientific principle, the Heraclitus principle, must be taken into account.

I emphasize what I have already stated here earlier. This present report of mine on the Kantian paradoxes, is dedicated, in my original capacity as a leading physical economist today, to a matter of the scientific conception of the underlying processes unique to the human individual mind, rather than the basis which would have been preferred, otherwise, in the department of physics, as that department is customarily defined today. Therefore, the issue of the principle which defines the Noösphere, should be preferred as our primary point of departure here, after which we shall examine the astrophysical implications of that view, this time from the standpoint of the action of the human mind on the physical universe in which we dwell.

We must prefer this sequence, rather than beginning as the indicated ancients had proceeded, with the study of the human mind as it might be viewed from the starting-point of the stellar cosmos.

In other words, not only are we viewing the cosmos as the work of the Creator; we are viewing man as he has been intended to become, to develop: *man as acting in the efficient image of that Creator*. This is the standpoint which I em-

ployed in my earlier "Vernadsky and Dirichlet's Principle." The crucial point for the scientist is, that the concept at issue here, is, *primarily, what the individual human mind does to change the cosmos, rather than the different question, for a different occasion: what the cosmos does to man.*

Before proceeding to that principal topic of this chapter of our report, there is one dirty little matter to be put to one side.

The view of man I present, thus, here, is in specific opposition to the more popular, but frankly Satanic views prescribed by the Delphi cult of Apollo and its pro-Satanic disciples of

Those hypotheses, when combined with the proofs corresponding to a unique experiment, define the existence of the performing, unseen object, whose shadowy presence is reflected in a cognitive view of the experience of our sense-perceptions. What is defined, thus, is the existence of the object which is so pervasive, everywhere, that it is expressed even beyond the limits of the greatest conceivable smallness of calculations. It is not the mere mathematical infinitesimal in itself which is the power; it is the universality of the principle of our universe whose efficiency reaches, to express itself, into the tiniest nooks and crannies of that universe.

such modern parodies of the Olympian Zeus cult as empiricism and Kantianism. The view of the creative powers of the individual human mind which I represent here, is in opposition to the views held by reductionists, such as both the empiricists and their existentialist offspring of the frankly satanic, Dionysian cult of Friedrich Nietzsche.

Those latter are, in their extreme expression, the views of such among Nietzsche's followers as Adolf Hitler, Martin Heidegger, and, in turn, their existentialist associates and followers. However, with closer examination, all existentialists are no less Satanic—one might say, "Satan wearing a fig-leaf," than the howling Friedrich Nietzsche.

It is to be said, similarly, that the empiricists in general are no less Satanic on this account than all others among those who uphold that Lockean empiricist tradition of what is termed either "property" or "shareholder value," a tradition which places property above, and in opposition to the rights of the person. The latter is the policy deployed under the Preamble of the pro-slavery constitution of the Confederate States of America (CSA). The Confederacy's notion of "property right" (e.g., "shareholder value") was the same devilish

Moon is of high-ranking importance today, in the increasingly urgent task of managing the natural resources of our planet during the course of this new, present century.

dogma of what were, hereditarily, specifically, both the Iberian-Venetian (Habsburg, et al.) and Lockean (Anglo-Dutch Liberal) apologies for the institution of modern chattel slavery.³⁵

Vernadsky Through the Eyes of Riemann

In my endorsement of Vernadsky's statement, that the physical space of his universal domain of the Biosphere and Noösphere, is Riemannian, I was careful to stipulate that Vernadsky's understanding of Riemannian geometry itself was poorly informed.³⁶ Nonetheless, despite that shortcoming in his limited direct knowledge of this matter of Riemann's work, his own objections to the advice he had been given on the subject of Minkowski and others, are valid objections to certain elements of the point of view of those who might have misadvised him on some points of the subject of geometry. He had been told by "N.N. Luzin and S.P. Finikov," that his, Vernadsky's dynamic portrait of the Biosphere and Noösphere were Riemannian, and on that specific, narrow point of fact, they were right. Such were the pitfalls of the intellectual life of science under the sway of the reductionism permeating the Soviet system's Marxist ideology.

On this account, it should be readily understood, that the impact of characteristically, heavily reductionist, often hysterical, and sometimes savagely intrusive institutions of Soviet ideology on Russia's science, would tend, strongly, to prevent the circulation of competent insight into even the merely non-Euclidean geometries such as those of Lobachevsky and John Bolyai, let alone an explicitly *anti*-Euclidean physical geometry such as Riemann's. Soviet ideology's intrinsic hostility to both Riemann and, in fact, to Vernadsky's work as well, had two complementary premises in the religion-like, ideological kernel of the Marx-Engels legacy. This parallels the contrasting, often brilliant accomplishments of Soviet science in the military domain, where scientific competence was at a premium, in contrast to the often dismal management outlook prevalent in the effects seen in the civilian sector, where brutishly reductionist Marxist-Leninist ideology tended to reign.

First, therefore, in studying the core of the fundamental contributions to modern science by Vernadsky, we must take into account the characteristic scientific incompetence, and aggressive intrusiveness of the radical reductionism inherent

35. As I have already emphasized in various fashions, up to this point in the report, the systematic denial of the existence of the common, identical principle of both human scientific and Classical artistic creativity is, as Aeschylus' *Prometheus Bound* emphasizes, the characteristic of the Delphi Apollo cult and its appendage the Dionysos cult. Hence, reductionism, which seeks to crush the noëtic principle out of existence, can not be regarded as other than implicitly Satanic. It is the principle of evil in the existence of the human species, as Plato and his Socrates understood.

36. Cf. Lyndon H. LaRouche, Jr., *The Economics of the Noösphere* (Washington, D.C.: EIR News Service, 2001) [appended excerpts from Vernadsky, Problems of Biochemistry II, Sec. 20], pp. 315-318].

in the predominantly British characteristics of the ideology and method of Engels, most emphatically, but also in the thinking of Marx.

On the first issue, that of Soviet reductionist ideology, the qualification to be stated, is that Vernadsky, first, does understand clearly what he means by a geometry of the *physical space* of both the Biosphere and Noösphere, respectively, and identifies this physical space as ordered in a dynamic, rather than mechanistic way. He does recognize that *physical space* as he defines it, requires a geometry which, as a matter of fact, meets the requirements of a *characteristically dynamic* quality of geometry, a geometry consistent with the actual characteristics of nothing other than the sense of Riemann's implicit exclusion, in the fact of his practice, of sundry Cartesian geometries, and also non-Euclidean varieties such as those of Lobachevsky and John Bolyai.³⁷

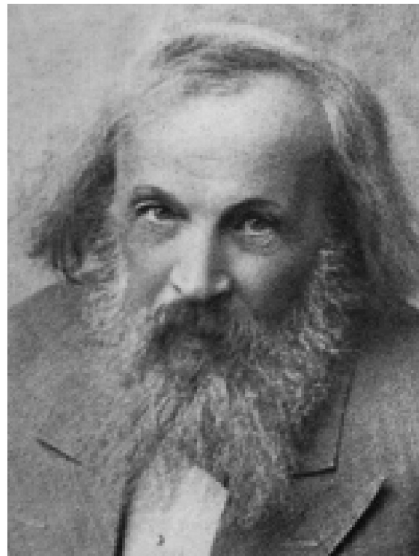
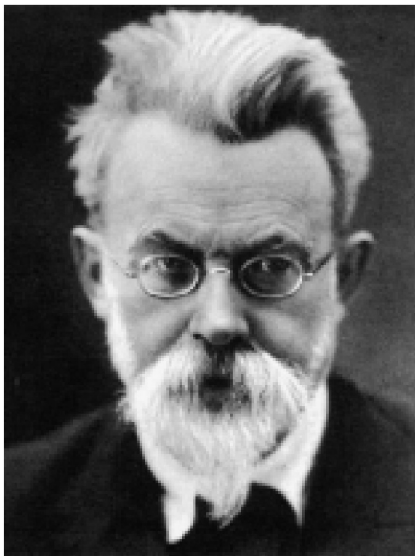
On the second issue, Vernadsky's lack of clear understanding of Riemann's work, the problems become somewhat complicated. These complications have important relevance to the treatment of the problems which neo-Kantianism typifies still today.

Vernadsky was clearly a practicing Christian in his way of thinking, a practice probably influenced, from where I sit, by awareness of the legacy of Cyril and Methodius. That probability of this influence on his scientific outlook is distinct from, but not in conflict with a second aspect of this issue. For this occasion, I would put the distinctions involved under the heading of religious issues, in the following way.

There are two general classes of what could be fairly received as authentically Christian belief, among most of our U.S. varieties of so-called "fundamentalists," the latter which should be excluded from being seriously considered to be actually Christians, but, rather, recognized as representing the belief of dupes of essentially pagan cults decorated with inappropriately borrowed names of a few Christian predicates.³⁸ That is to distinguish such cults from a traditional

37. See Riemann on Gaussian physical geometry, in Riemann's 1854 habilitation dissertation (note 13), and in Gauss's references to the subjects of Bolyai and Lobachevsky in both Gauss's *Werke* (including the appended volumes of correspondence) and as documented in *Carl Friedrich Gauss: Der 'Fürst der Mathematiker' in Briefen und Gesprächen*, Kurt-R. Biermann, editor (München: Verlag C.H. Beck, 1990). From his 1799 dissertation on, Gauss's geometry was, like Fermat's, a physical geometry, echoing what I have underlined above as the famous distinction underlined by Fermat, as first attested in Gauss's own 1799 attacks on the hoaxes of D'Alembert, et al. Under the personal attacks on him launched, after the 1799 dissertation, from Napoleon Bonaparte's France, Gauss avoided any explicit public reference to his own views on physical geometry until the famous responses to Gerling, and to Jonas and Farkas (Wolfgang) Bolyai on this subject, beginning 1832.

38. I employ "Christian" here in the ecumenical sense of Cardinal Nicholas of Cusa's ecumenical *De Pace Fidei*. For example, the standard Gnostic belief is typified by the example of Aristotle's theology, as that was denounced explicitly by Philo of Alexandria, as being implicitly a "God Is Dead" doctrine. The real world, according to that Aristotelean argument, is not run by the Creator, but by mysterious forces, as described by the Gnostic



The Russian-Ukrainian scientist Vladimir I. Vernadsky (left) is of approximately the same historical rank as his teacher Dmitri I. Mendeleev (right). The 1935 views of Vernadsky on physical chemistry show the essential continuity of the work of these two great figures of modern science—a line of work which continues to be of great urgency today, in the increasingly urgent task of managing the planet's natural resources.

Christianity, which is opposite to that counterfeit currency circulated by the Protestant “fundamentalists” and their nominally Catholic equivalent. The “anti-fundamentalist,” truthful tradition, expresses the sense of a systematic belief in accord with an acceptance of a sane, but not always perfectly sound, traditional, honestly intended reading of one’s *breviary’s* *New Testament* predicates.

The second class of actually Christian belief is based on a specifically scientific quality of confidence in what may concur with the faith of the first class of believer; however, this time, belief is enriched and maintained, as the modern tradition of Cardinal Nicholas of Cusa’s *De Docta Ignorantia* does, from the standpoint of faith coinciding with the scientific authority of knowledgeable, ecumenical reason.³⁹

In the case of Vernadsky, it is the second aspect of Christian belief which is clearly outstanding as an integral implication of his work as a scientist. The latter is the quality which implicitly permeates the work of Vernadsky on the subjects of

Claudius Ptolemy, which operate within the bounds of that from which the Creator implicitly excluded His own Will, by creating a perfect, permanent system. Most of the wild-eyed Protestant cults in the U.S.A. since traitor Aaron Burr’s grandfather Jonathan Edwards, passionately enjoy that prosatonic, “fundamentalist” taint.

39. Essentially, Nicholas of Cusa’s *De Docta Ignorantia* is the forerunner of Riemann’s 1854 habilitation dissertation and Riemann’s development of his hypergeometry on the basis elaborated in his *The Theory of Abelian Functions*. Since all competent modern physical science was developed on the basis identified by Cusa and his professed followers Leonardo da Vinci, et al., the intellectual convergence of Cusa, Kepler, Leibniz, Riemann, and Vernadsky, is of more than a small degree of significance for science today.

the Biosphere and Noösphere. No other conclusion, but the latter one, could be competently adduced from what I have referenced as the work of Vernadsky as a scientist; this implication of Vernadsky’s work for modern science in general, can not be avoided by competent scientists. It is otherwise fairly identified as the quality which also permeates, similarly, the work of Bernhard Riemann.

In this respect, as I shall clarify this point later in this chapter, competent science can not be separated from a competent kind of theology, a theology which has nothing to do with those pagan superstitions which are often passed, like counterfeit money, in the form of the kind of “religious fundamentalism” to which the intellectually and spiritually impoverished President George W. Bush, Jr., pretends. Bush’s opinion is, ostensibly, more or less the kind of politically cosmetic, fraudulent

religious cloak, which Bush claims to have adopted, by inexplicable instant persuasion, at the implied snap of the grubby fingers of George Shultz.

The very existence of a competent physical science depends on the act of discovery of what are called “universal physical principles,” which can be accomplished only through a quality of an individual’s sovereign act of creative intellectual discovery, an event utterly alien to what is manifestly the deeply troubled mind of this overtly sadistic President. Human knowledge of the experience of such valid acts of discovery of such principles, is the notion of creation from which knowledge, as distinct from mere blind faith in the existence of a Creator, flowed, as this knowledge flowed, with certainty, from the celestial heavens of ancient astrophysical practice, into human knowledge.

The problem encountered in much of the practice of science today, is the impassioned rejection, as by the empiricists, of that notion which I have just identified, the rejection of the experience of the creative act of discovering an empirically demonstrable universal physical principle, by the sovereign individual. This is a rejection which is also the characteristic of such heathen devotions to reductionism as empiricism and of the popular varieties of so-called “religious fundamentalism.” It a rejection of the practice of creative reason, a prohibition which can be dated in ancient European mythology to the Olympian Zeus’s banning of mankind’s access to knowledge of fire. It is that sophist’s rejection of reason, which was characteristic of the cult of the Delphi Apollo and the Roman imperial Pantheon.

One should ask oneself: Since these latter, poor unfortu-

nates reject the creative principle, ontologically, what is it that these poor, populist gnostics, such as what President Bush claims to be, actually worship in their churches, instead of the Creator?⁴⁰ If they reject this principle, as the empiricists and kindred materialist ideologues do, how could such poor wretches understand, what Cusa, Kepler, Fermat, Leibniz, and Riemann understood, and as Vernadsky understood, the principles of human creative reason on which the progress of society depends absolutely?

Hence, as I shall show some deeper implications of this later in this report, a certain belief in the Creator is the indispensable foundation of consistent competence in methods of physical science.

It is also, as Bruce Director points to that connection in the piece accompanying this report, on the subject of the significance of the life of Theaetetus, the basis for what is rightly recognized as natural law. If we recognize that man is made in the image of the Creator, by virtue of those creative intellectual powers of the individual which set the human individual apart from the beasts, then the human individual is sacred under law, as the clear intention of our own U.S. Federal Constitution stipulates the authority over all other aspects of the U.S. Constitution, and of all law otherwise. Hence, the *agapē* of the Socrates of Plato's *Republic*, the Apostle Paul's *I Corinthians* 13, and the Preamble of *The U.S. Federal Constitution*.

On those relevant accounts, such as Vernadsky's weak knowledge of some essential features of Riemann's work, I am saying, for the reason I have just given, that the geometry of Vernadsky's Biosphere and Noösphere is, in fact, Riemannian: not because Vernadsky says so, but because I say so—a burden of responsibility which I assumed for that and its implications, in the manner I presented the case in my "Vernadsky and Dirichlet's Principle." I limit my attention in this immediate section of this chapter, to the core of the proof of that argument.

I have made much of the following argument in earlier locations, as also, in part, in preceding parts of this present writing. Nevertheless, I include such essential elements of information and knowledge here, for the sake of relative completeness of the argument I present now on the matter of the point immediately at hand.

The functional distinction between man and beast, is expressed as what the devoutly reductionist anthropomorphist might describe as the beast's blind faith in the self-evident reality of sense-perception; whereas, the fully conscious human individual knows that the images of sense-perception are only shadows of the impact of the real world on the individual's "biological" sense-perceptual apparatus. That is the essential point of material difference from which the distinction flows, in the practice of science, between the reductionists,

40. What is the wrong number which that President had reached, when he claims to have been instructed by the Creator? Was it, perhaps, the kitchen extension of the Enron-connected former Senator Phil Gramm?

such as the followers of Descartes and Newton, and those operating, from the contrary standpoint, from the advantage of an actively healthy sense of human identity, as Bruce Director's companion-piece underlines this view by Plato et al.

We should know, more or less as the Apostle Paul puts the point within his celebrated *I Corinthians* 13, and as Carl F. Gauss, in 1799, lambasted the empiricists D'Alembert, Euler, Lagrange, et al., on this point of fact, that *our senses show us only the shadow of reality, as reflected in the images seen in a darkened mirror*.

These considerations, referenced to the benchmarks represented by the connections between the work of Riemann and Vernadsky, are of exemplary importance for understanding the way in which a healthy human mind works.

Kepler, Fermat, and Leibniz

Typical of the point which I have just made, is the case which I have referenced earlier here, the case of Pierre de Fermat's physical proof that light is transmitted according to what became known as *a universal physical principle of quickest time*. As Christiaan Huyghens described, and also applied the radiating impact of Fermat's discovery: *Whose clock is properly constructed to tell the natural time of physical space?* Fermat accomplished his fundamental contribution to the discovery of the existence of physical space-time, as opposed to empty space, through insightfully reconciling what was, in fact, the only superficially contradictory phenomena of reflection and refraction. The work of Fermat on numerous topics, was the foundation of some of the work of his relevant contemporary Pascal,⁴¹ and included Huyghens' attempted approximation of the functional notion of "least time," by the cycloid [Figure 5]. The impact of Fermat's conception is to be traced through the later work of Leibniz and Jean Bernouilli, where it leads into Leibniz's refined definition of his limitlessly infinitesimal calculus, as determined by an underlying catenary-linked (rather than cycloid-cued), universal physical principle of least action [Figure 6].⁴²

For us, as for the Pythagoreans and Plato generally,

41. Fermat (1608-1665), and Pascal (1623-1662). Although present-day conventions emphasize the religious issues in which Blaise Pascal was prominently engaged, his importance for science lies largely in mathematical works. Some of the most crucial among these works, were unpublished during his lifetime, but Leibniz was afforded access to them during the interval 1672-1676, through his connections with the Pascal family through Christiaan Huyghens, and through the great science project of Jean-Baptiste Colbert. These Pascal archives were significant in sharpening Leibniz's approach to his own 1676 presentation of his calculus. I had relevant access to some of this surviving material of Pascal during the early 1980s. The case of Leibniz's mechanical calculator, which superseded Pascal's device, is especially notable, since Pascal's device was based on his knowledge of the calculating machine which had been designed and used by Johannes Kepler to assist the latter's calculations.

42. It was Leibniz's discovery of this principle of universal physical least action, which drove the otherwise seemingly sober Leonhard Euler into the lunatic frenzy of his 1761 *Letters to a German Princess*, to which I made notable reference in my 1990 response to Laurence Hecht, *The Science of*

FIGURE 5

Properties of the Cycloid



A brachistochrone model built by Francesco Spighi in the 17th Century. A ball that rolls down the cycloidal track reaches the bottom faster than one rolling down the straight track.

Fermat's and Leibniz's method expresses the viewpoint of competent modern physical science still today. The specific talent of the human mind, which distinguishes us from the beasts, is the conceptual powers by means of which we are enabled to infer, and to validate discoveries of universal physical principles, *hypotheses*, that by what Riemann defines, still, for today, as a certain, unique quality of experimental test of principle.

Those hypotheses, when combined with the proofs corresponding to a unique experiment, define the existence of the performing, unseen object, whose shadowy presence is reflected in a cognitive view of the experience of our sense-perceptions. *What is defined, thus, is the existence of the object which is so pervasive, everywhere, that it is expressed even beyond the limits of the greatest conceivable smallness of calculations. It is not the mere mathematical infinitesimal in itself which is the power; it is the universality of the principle of our universe whose efficiency reaches, to express itself, into the tiniest nooks and crannies of that universe.* This is the method of Kepler and Leibniz in modern science.

The relevant common blunder in the teaching of mathematical science, such as that of D'Alembert, Euler, Lagrange, Cauchy, and their duped followers in secondary schools and universities, still today, is the teaching of the assumption that the existence of the mathematical infinitesimal is a simple extension, ontologically, of mechanical schemes, such as those of Euler's foolish attack on Leibniz, premised upon Cartesian (e.g., Euclidean, linear) notions of *empty space-time*.

Christian Economy. (See note 23.) It was obviously, for related reasons, that Euler seems not to have acknowledged the fact of Leibniz's original discovery of natural logarithms, which Leibniz had derived from the role of the catenary principle in defining the mathematical implications of physical least action in the infinitesimal calculus.

Hence, we must recognize the virtually criminal absurdity inhering in the plainly evil role of Augustin Cauchy, the "mortal" intellectual enemy of Monge, Lazare Carnot, Arago, Fresnel, Ampère, et al. I point to the evil in the famous "limit" doctrine inhering in calculus of the hoaxster (and the relevant plagiarist of a crucially important work of Niels Henrik Abel).⁴³ The examination of that issue, as posed by Cauchy's hoax in that form, leads to the following crucially relevant point of the discussion of Kant and neo-Kantianism.

The conception of the infinitesimal calculus was developed, chiefly, by Leibniz. This calculus was derived from the instructions of Johannes Kepler, as was the later, Nineteenth-Century work on elliptical functions, from Gauss through Riemann. Kepler had bequeathed two tasks to future mathematicians. The first of these had been the challenge of what became, through Leibniz, the infinitesimal calculus. The second, the challenge of elliptical, and also hypergeometric functions, was mastered through the accumulated work of many Nineteenth-Century contributors, including Gauss, Abel, Riemann, and their contemporaries.

To account for the essential features of both of these developments, take the example of Johannes Kepler's uniquely original discovery of the universal principle of gravitation, where the same principle of Fermat's discovery of quickest pathway, had, implicitly, already underlain Kepler's discovery. This distinction was also made clear in the way in which Fermat's characteristic way of thinking was expressed as explicit rejection of an arithmetic (e.g., reductionist, Euclidean) approach to the subject of Diophantine functions, in favor of the geometrical basis consistent with physical science. Fermat's method, like that of Kepler, and Riemann later, was also the earlier, *dynamic* method of the Pythagoreans and Plato.

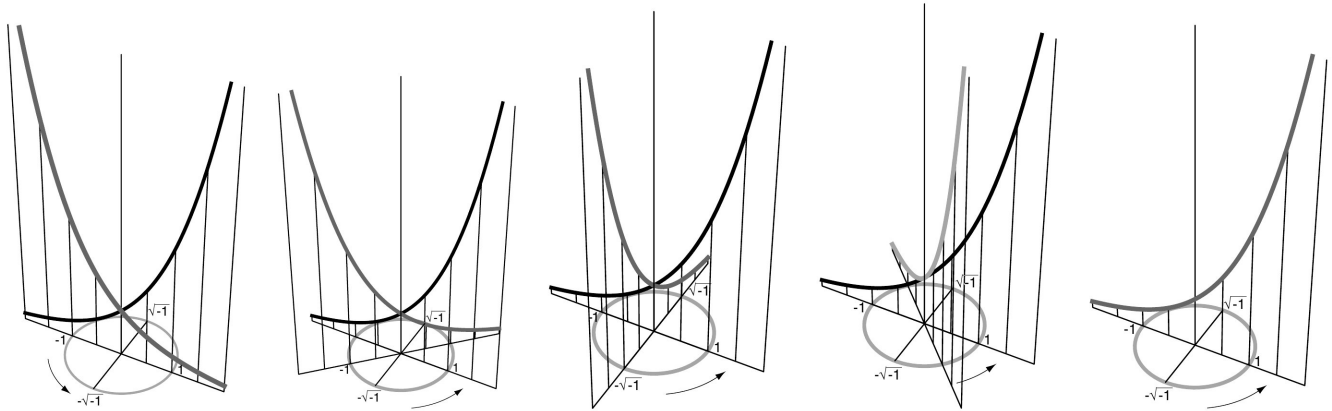
The principle of gravitation is a principle of change, which is always a "non-linear" *change*, even to the smallest conceivable instant of the orbital pathway. The related most valuable, if imperfect, work of the follower of Fermat and Pascal, Huyghens, in optics, follows that same route, an approach in which the future appears, anomalously, as a matter of principle, to act efficiently to shape the present. In other words, for all such cases, as for the ancient Heraclitus who haunts the premises of Plato's *Parmenides* dialogue: *nothing is permanent, nothing is a universal physical principle, but the intention expressed by an underlying principle of universal change.*

To illustrate this approach, visualize a sphere. Let this be initially, functionally, the sphere of reference from Plato's

43. The lack of personal character of Cauchy is implicit in the way in which he and his senior Laplace, were enabled to take over the ruin the foundations of the work of France's Ecole Polytechnique, through the way they secured their appointment, courtesy of the Duke of Wellington, to the position in which they wrecked the work of the Ecole Polytechnique, in favor of the ideology of the British victor. The case of Cauchy's plagiarism of the work of Abel came to light when Abel's missing document was found in the deceased Cauchy's personal effects.

FIGURE 6

The Complex Domain and the Catenary



The formation of the catenary as the arithmetic mean between two oppositely directed exponential curves, is situated implicitly within the complex domain. The action that generates these two oppositely directed exponentials, is a rotation perpendicular to the plane of the catenary. Gauss recognized this as the geometric mean between 1 and -1 ; or, the square root of -1 .

Timaeus dialogue. Let this sphere be the space of our physical universe as the observed universe surrounding our personal point of observation, as this is normalized to the effect of simulating a fixed position of the hypothetical observer within the Solar System, as might be imagined to correspond mathematically to a central point within the Sun. In the observer's imagination, this sphere represents a "finite but unbounded" universe of perceived, Riemannian physical space-time.⁴⁴ This presents an obvious, elementary step toward freeing the mind of the student from the cult of what is presented as a Euclidean manifold.

Now, plot actually observed motion within that ostensibly three-dimensional, spherical universe so constructed by the human mind from its sensory experience. Now, study two geometrical classes of motion marked out in this fashion.

The first choice from among these two classes of motion, is that they are "regular" in some meaningful, and defensible sense of simply recurring. The instant we consider elliptical orbital pathways of actually physical action, such as Solar orbits—as absolutely distinct from the mere ellipse as such—we are confronted by the conceptual problem of seemingly regular motion which is not simply recurring. *The infinitesimal enters whenever we depart the illusory belief in simple, Euclidean or kindred notions of space-time, for the experimental realities of physical space-time!*

This latter, paradoxical fact, led Kepler to discover the universal principle of gravitation as a universal, regular principle of constant change; this echo of Heraclitus and Plato, was in direct contrast to, and opposition to the simplistic,

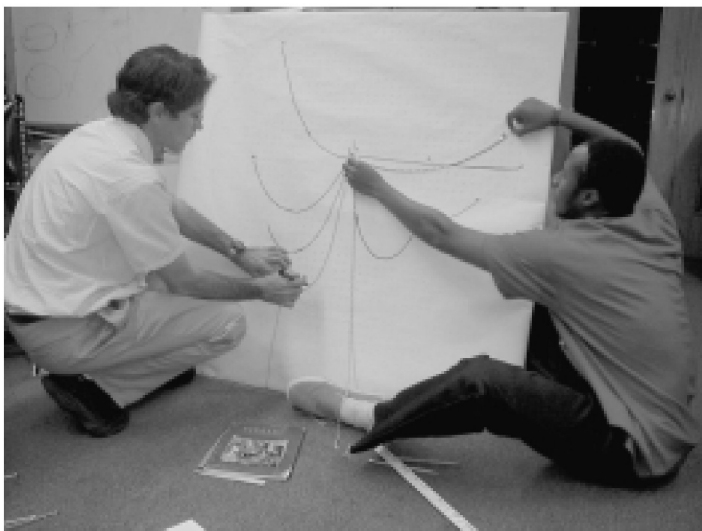
erroneous schemes of Claudius Ptolemy, Copernicus, and Tycho Brahe. Although the ellipse is a regular figure, at first impression, *the orbit is not determined by the mathematical ellipse, but the elliptical trajectory is determined by the orbit, by an efficiently physical principle of what is mathematically a constantly infinitesimal change, known as gravitation.* Hence, Kepler's foresight into the need for a calculus of the type actually launched, uniquely, by Leibniz.

With that, the fun only begins. Try defining spherical functions, not only on the surface of a sphere, but within spherical physical space-time. For example: locate the actual, constantly changing vector of motion of the planet Mars along its orbital pathway, relative to Earth. Then, try the asteroids, whose orbital characteristics were identified by Kepler as the product of an exploded former planet lying in an orbit between those of Mars and Jupiter, *before* the first asteroid was discovered, by Gauss, as being such an object.

The fact that the motion along its orbital pathway, is constantly changing in an interval always smaller than the smallest one chosen, defines gravitation as a universal principle, as expressed in the small as an infinitesimal. All functions subsuming such valid infinitesimals express a universal principle, implicitly one as large as the finite universe. The smallness of an infinitesimal, when so expressed, is a reflection of a universal. To chop off the infinitesimal of that sort, as Cauchy's conception demands, at any arbitrary point (except for legitimate cases of rough approximations which involve no test of principle), is to perpetrate a scientific hoax in any instance in which the matter of a test of a physical principle is in question. The existence of such infinitesimals tells us something of crucial significance about the calculations which generate, mathematically, a true infinitesimal of the number domain.

Unless this numerical phenomenon has been generated

44. The choice could be, instead, the estimated center of our galaxy, or some system of galaxies. As said by A. Einstein, "finite but unbounded" is the characteristic organization of a Riemannian universe defined in these terms by Riemann's conception of Dirichlet's Principle.



EIRNS/Sylvia Spaniolo

A pedagogical study of the catenary—the shape formed by a hanging chain—at the LaRouche movement’s Chicago office.

by a mistake in the relevant actual, or imagined physics, that fact should warn us that there is some universal, such as a universal principle, existing in our universe which we may have overlooked. The wrong assumption would be, that this principle exists only in the small; on the contrary, it exists pervasively in the universe at large. It may be, and often has been discovered through anomalies in the very small; but, like the discovery of universal gravitation by Kepler, it is a universal principle of the universe in the large. The failure to recognize the point which I am stressing here and now, is a typical consequence of the use of the fallacious, mechanistic, method of Descartes’s empty space-time, which excludes consideration of the reality that real processes of our universe (and there is no other) are dynamical, not mechanical in mode.⁴⁵

This is the same difference, in the very small, emphasized by Vernadsky, which underlies the universal difference between the chemistries of living and non-living processes.⁴⁶

That is what is practically at issue in the exposure of the fraud perpetrated by D’Alembert, Euler, Lagrange, et al., by Gauss’s referenced 1799 dissertation. When the issue is not “rough approximation,” but a matter of principle, what Gauss had shown D’Alembert, Euler, Lagrange, et al., to have perpetrated, was fraud in the fullest sense of a hoax willfully perpetrated by going backward against the stream of civilized progress, a backwardness which expresses the kind of pagan religious hostility against already established science, which

45. There is a populous class of elementary blunders in what is mistaken for physical science which follows the method of Descartes. By assuming, falsely, that the mechanistic methods of Descartes are scientific, a class of falsely assumed proofs of principle is generated.

46. LaRouche, “Vernadsky and Dirichlet’s Principle.” (See note 29.)

must be expected of the followers of such Venetian hoaxsters as Paolo Sarpi and the followers of the Paris-based Cartesian Antonio Conti.

Therefore, be forewarned, that the association of what is defined by modes of unique experimentation as a universal physical principle, is a *universal*, not what the mathematician, as Leonhard Euler did, mistakenly equates to the notion of an *ontologically* infinitesimal existence as such. *It is infinitesimal because you can not get rid of its reflection of the existence of a universal physical principle, no matter how small the realm of physical space-time explored; it is probably a universal principle which, nevertheless, is never ontologically infinitesimal in principle.*⁴⁷

Today’s commonplace ontological fallacies of the “infinitesimal domain” arise, in a logically “hereditary” mode, from interpreting even valid experimental evidence as demonstrations of a form of existence specific to a Cartesian-like, mechanistic ordering within an illusory, empty space-time manifold, such as a Kantian, or neo-Kantian manifold. The infinitesimal as seen with a microscope from the parapet of an ivory tower. Such matters belong, therefore, not to the department of experimental physical science, but the psychoanalyst’s couch.

There lies the root of the hysteria of Leonhard Euler and J.L. Lagrange against Leibniz, and Lagrange’s hysteria against the 1779, first form of presentation of Gauss’s 1799 version of his “Fundamental Theorem of Algebra.”⁴⁸ They were hysterical, because “they could not get rid of” the implication of the ancient Delian paradox which had been solved by Plato’s friend, the Pythagorean Archytas of Syracuse. The cubic roots which tormented Cardan et al.,⁴⁹ and continued to torment D’Alembert, Euler, and others, were recognized as symptomatic of a problem which pointed to the importance of Leibniz’s emphasis on the catenary-cued character of the principle of the infinitesimal calculus. In the hysterical efforts to deny such implications, D’Alembert, Euler, et al. sought to rid themselves of their embarrassing posture, by denounc-

47. Cf. Felix Klein in his 1895 *Famous Problems of Elementary Geometry*, as republished in English translation by W.W. Beman and D.E. Smith (New York: Chelsea Publishing Co., 1962). The extremely talented and influential Felix Klein was not always on the side of the angels, as that point is illustrated by his part in handling the history of transcendental functions from (actually) Archytas and Plato through the questionable claims of scientific originality of Hermite and Lindemann. The modern expression of this problem can be located from the starting-point of Fermat on the importance of geometric, rather than Euclidean method for treating Diophantine functions, through the actual discovery of natural logarithms by Leibniz. Klein’s account in this referenced location identifies the modern points of reference for this continuing controversy.

48. Gauss, whose higher education had been chiefly under Abraham Kästner and Eberhard v. Zimmermann, was prompted to publish a 1797 paper which was used by his sponsors as the 1799 publication as his doctoral dissertation.

49. Girolamo Cardano (1501-1576).

ing the offending footprints of actual existences as “imaginary numbers.”

The root of the issue brought into view by the referenced work of Cardan et al., is shown by Archytas’ construction of the doubling of the cube [see Figure 4 in accompanying article by Bruce Director]. Viewing Cardan’s problem from the standpoint of Archytas’ construction, the nature of the problem in hypergeometric functions, evaded by Euler et al., is immediately clear. What the empiricists fraudulently termed “imaginary” magnitudes, were an expression of the powers which Leibniz associated with modern echoes of the Classical Pythagorean-Plato concept of *dynamis*.

That concept of dynamics is what Gauss defended, in his 1799 dissertation, against D’Alembert et al. In fact, all of Gauss’s leading work points toward progress in that same direction implicit in that dissertation, as this is realized explicitly, more fully, in the work of Riemann.

Gravitation, so defined by Kepler, is of the quality which the Pythagoreans defined by the term *dynamis*, the term and concept which Leibniz adopted, as *dynamics*, in pointing out the absurdity of Descartes’s *mechanistic* conception of motion of physical objects in space and time. It is the same quality of conception expressed by Fermat’s concept of quickest time, the same concept refined as the catenary-cued concept of universal physical least action, as this is expressed by Leibniz’s anti-Cartesian (e.g., anti-Newtonian) method of infinitesimal calculus. It is also an expression of the same root-conception of *dynamis* which the Pythagoreans and Plato associated with the mode of geometric, non-algebraic action, as that by which the square and cube may be doubled by construction.

It is also the issue raised by Gauss in his 1799 doctoral dissertation, in which he exposed the frauds perpetrated in the name of geometry by D’Alembert, Euler, Lagrange, et al., and, implicitly, Cauchy, Clausius, Grassmann, et al. later. This returns our attention here, to the subject of the way in which the minds of Kant and Windelband were crippled by the influence of the dogma of reductionism. For this purpose, consider the physical implications of Gauss’s 1799 dissertation in light of today’s prevalent state of mental health in high places.

The ‘Complex Domain’ and the ‘BoBos’

As the development of the practical notion of hypergeometry, by, most emphatically, Gauss and Riemann attests,⁵⁰ what the fanatics, such as the empiricist Euler, defined as “imaginary numbers,” are actually a reflection of the fact that our sense-perceptions are not the objects of reality, but are the shadows which reality casts upon our biological organs and related mental processes of sense-perception.

The name of the conception which this fact poses, is “the complex domain.” *The issue is: not only how might we pierce*

the veil of shadows, to discover that real object which has cast the shadow of sense-perception, but, once we have identified such an object existing beyond the direct reach of our senses, how do we determine, with certainty, that that object has the efficient actual existence we might attribute to it? That is the meaning behind the issues with which Gauss’s 1799 doctoral dissertation confronted D’Alembert, Gauss, et al. In other words: What is actually in progress, “out there,” in real physical space-time, beyond the direct reach of mere sense-perception?

Here, we touch the core of the issue of reductionism which underlies the fallacies of both Kantian and neo-Kantian disorders.

Herr Kant: “Were you a monkey, rather than actually human, we would not blame you personally, if you were to describe these magnitudes, as Euler, de Moivre, et al. did,⁵¹ as merely ‘imaginary.’ Immediately, for a monkey, they are only imaginary; if you are not a monkey, then you should be able to recognize that human beings think differently than cases of the referenced behavior of Kant, Euler, and Lagrange imply. If you think like a monkey about such matters as these, you do as Euler et al. did; you would seek, as Thomas Huxley and the horny thumb of Frederick Engels’ mind would do, a century later, to attempt, in the name of socialism, communism, or whatever, to make a virtual monkey of mankind. You, Kant, did as Britain’s Huxley and Engels would do. You, like that Delphic Satan, the Olympian Zeus of Aeschylus’ *Prometheus Bound*, demanded that ‘fire’ be treated as only ‘imaginary,’ or, untouchable, by the mind of mortal man.”

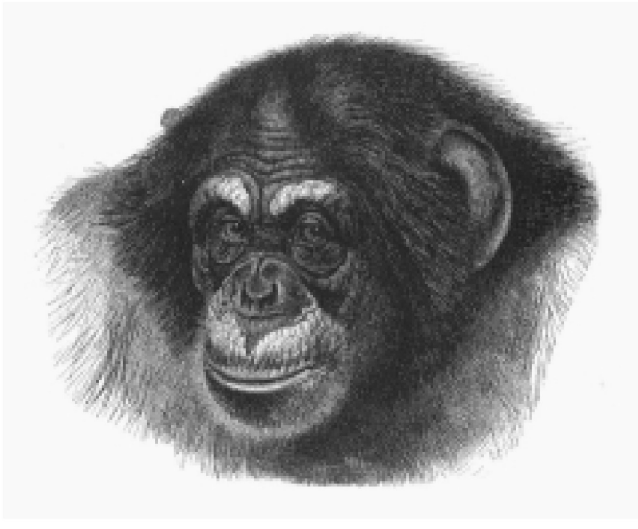
Foolish people, like Kant, defend the empiricists’ Delphic, Apollonian hysteria on this point; they defend their obsessive, and perhaps hopeful belief that they, like their neighbors, are only sex-crazed, or similar varieties of monkeys needing instruction in table manners. Often, they then enjoy the misfortune of getting the kind of neighbors, and mates, which they desire, and which they deserve.

The issue of the complex domain, is, thus, at least as much a clinical question of sociopathology as mathematical physics.

The issue, of course, is the question, whether or not discoverable universal physical principles actually exist. Look at the kind of contemporary mental pathologies which tend to lead their victims to the assumption, as that of Kant, and Leonhard Euler, that discoverable universal physical principles do not exist, are either “merely imaginary,” or are fruits of either deduction, or deduction turned inside-out, with the tripe hanging outside, so to speak, as entrails of the “inductive

50. Gauss (see note 11).

51. Abraham de Moivre was a crucial senior figure, associated with Paris-based Venetian Abbot Antonio Conti and René Descartes, who exported the neo-Cartesian cult to the London of Isaac Newton controller Dr. Samuel Clarke. Moivre’s featured role in the fraud against Leibniz was complemented by his supplementary role in Leonhard Euler’s adoption of the rejection of the complex domain as relating only to “imaginary” magnitudes arising as virtual accidents of mathematical calculations.



Herr Kant: "If you think like a monkey about such matters as these, you do as Euler et al. did; you would seek, as Thomas Huxley and the horny thumb of Frederick Engels' mind would do, a century later, to attempt, in the name of socialism, communism, or whatever, to make a virtual monkey of mankind."

sciences." Gauss's attack on the hoax of Euler et al., makes the issue of Kantianism formally simpler; Riemann's work, from his habilitation dissertation on, gets to the virtual essence of the hoaxes of Euler, Lagrange, and Kant.

However, we must not overlook the fact, that time has passed since the work of the Seventeenth, Eighteenth, and early Nineteenth centuries, when, despite the empiricists, most of the progressive development of the foundations of modern European civilization's popular life occurred. These are different times, especially the recent four decades. Different times; different customs in the official and general ways of thinking, alike.

People in the Americas and Europe today, do not think as they did as recently as forty years ago. With the rise of the so-called "Sixty-Eighters," the "Baby Boomers," the change in culture, in values, and in practical response to reality has turned, mostly, very much for the worse. Prevailing trends in opinion-shaping have moved away from physical reality, to seeking what today's worst fools have considered to be a more comfortable, imaginary world. As the contrast between zooming corporate financial gains and plunging physical conditions of life of nations shows, the prevalent trend of culture has been away from a functional connection of the "Boomer's" mind to physical reality, and, consequently, has plunged the customary thinking of an entire stratum of humanity into a radically different, worse way of reacting to topics of physical scientific progress and decay.⁵²

52. It is useful, in several ways, to compare this view of the distribution of potential within social processes, with Gauss's touching upon the subject of what Riemann defines as Dirichlet's Principle, in Gauss's 1840 "*Allgemeine Lehrsätze...*," as W.K. Bühler cross-references Riemann's notion to Gauss's, in his *Gauss: A Biographical Study* (Berlin: Springer Verlag, 1981).

Thus, today, like the virtual Yahoos of Jonathan Swift's *Gulliver's Travels*, our contemporary fugitives from the trends in the present real state of humanity insist, more or less implicitly, that there are no universal physical principles, but only popularized conventions, habitual ways of thinking, ways of thinking rooted ultimately in mere reductionists' brands of statistics. They mean approximately the kind of statistics typified by that Nobel Prize-winning mathematical formula which led the fattest cats of Wall Street and the Cayman Islands into the hedge-fund crisis of August-September 1998, and set the mathematical precedents for what has lured many of the leading banks of the world into the far greater, Germany 1923-like hedge-fund crisis of today.

Today, our sophists seek to change the subject, away from the clear evidence of a collapsing economy, as by jabbering, "But, how is the market doing today?" That credulous lunatic attempts, hysterically, to fool himself most of all. He seeks, thus, to escape from the real world, whenever the evidence of a physical collapse of the economy around him threatens the devoutly sought elation of his fantasy-life.

His reaction to developments which threaten his delusory elation is, perhaps, to change his mistress, his life-style, his employer, or, perhaps, his sex. "I need a new life," is what the typical, emotionally distressed, ideologically middle-class "Baby Boomer"⁵³ of today thinks, when the credibility of his or her fantasy-life is threatened by reality. Anything, but face the reality of the present human condition!

For him, or her—sophists that they are—principles do not exist, but only conventions, only what is called "spin." It is necessary to see the way that contemporary sophist's mind works, to understand how and why he behaves as he does.

This currently widespread psycho-social pathological pattern of crisis-cued behavior is, predominantly, a reflection of the mid-1960s shift of the "Baby Boomer" generation, from earlier, conventional acceptance of the reality of physical economy, into a fantasy-life existence in a "services economy." The hard realities of progress in producing physical wealth, which were the preceding generations' mooring in reality, have been replaced, among the relevant social brackets of Baby Boomers, by a Purgatory-like "end of history, post-industrial, Golden Generation's withdrawal from the real world, into fantasy life.

This change has brought to the surface, as present-day expressions of existentialism, a kind of modernist's parody of the long-standing, prevalent social psychopathology which

The characteristics of generations are not statistical averages of opinions expressed by individuals, but that characteristic distribution of tendencies which, as a *dynamic* expression of potential, defines a distinct functional "set" within the population. This is defined, primarily, not by expressed views, but by reaction of all parts of the population to the expressed tendencies of some core grouping within that population.

53. I have been informed by my Paris associates, that the French term, *Bourgeois Bohème*, or "Bo-Bos," is closer to the natural truth of the matter than the English "Baby Boomer."

was expressed by intellectuals such as the former circles of Locke, Conti, Hume, Euler, Kant, et al., of the Descartes-Newton cult of Eighteenth-Century empiricism and its late Nineteenth- and Twentieth-Century followers.

The typical dupe of the cultural downshift erupting in the “68ers,” and the resulting habitual hysteria of fleeing from physical reality into the fantasy-life of statistics, is a social-political phenomenon of an emergent quality of virtual mass-insanity, a quality specifically characteristic of a rather specific part of a certain generation, of which the hard core, “Beatle-brained ’68ers” were the relatively extreme case. It was, again, the result of the shift from a producer economy, to a “post-industrial,” “services” economy, which brought the long-standing psychopathological tendency of the preceding decades, into the nearly full bloom it has now achieved, during a period of approximately a decade and a half to date: during a time of middle-class life in which the prospects of advancement in social status and general well-being were perceived to be tapering away.

Now, if the stratum afflicted with that “service economy” mentality does not change, if it does not abandon that failed ideology, that generation would not survive, and it would, perhaps, take the world’s civilization down with it in sharing the prospect of doom which those folk have now wrought for themselves. All influential ideas have power, especially the destructive power of very bad ideas. Thus, finally, perhaps, the odd poor lunatic of the past will, perhaps, soon be joined by a growing ration of veteran ’68ers, now sullenly bearing the sandwich-signs, “The End is Nigh,” as they move along their dismal line of march through the ruins of today’s yesterdays. Hopefully, the shock of reality will change their minds before that state of dismay is achieved, at least in the minds of most of them.

Today’s world is dominated, especially from Europe, Japan, and North America, by a powerful financier oligarchy which is presently determined to uproot and eradicate forever the kind of society which the modern nation-state republic, such as that of President Franklin Roosevelt, represents. They are determined to establish now, more or less immediately, and with finality, a system in which governments, if they are permitted to exist, never rise above that state of relative powerlessness in which globs of financier-oligarchy cannibals eat governments and large portions of the population, too. They intend, in fact, to recreate a post-modernist caricature of the medieval system, the *ultramontane* system, when mankind was a victim of a concert of Venetian financier-oligarchy and brutish Norman chivalry.

Unfortunately, for both themselves and their intended victims, this financier-oligarchy class is worse than merely clinically insane. They are also consummately incompetent, as the recent forty years of physical decline of Europe and the Americas attest. A world under their reign would not long exist, as they, too, were eaten by the cannibals they have become. They are a form of power which has lost its former

relative potency of even mere fitness to survive.

Therefore, it is neither courtesy nor kindness, to refuse to tell the victim of the mental sickness which the all-too typical example of BoBo culture represents: his desires are the root of his discomforts, and those rising floods of discomforts are not the evidence of a curable disease.

Therefore, to the degree that the typical “BoBo” has entered into the fantasy-life which belief in “a services economy” represents, it were almost impossible for him, or her, until now, to recognize the practical significance of the technical term “complex domain.” One who attempts to raise such topics for discussion, often experiences the sensation of a metallurgist’s attempt to conduct a dialog with a typical representation of “an Old Stone Age” culture. Culturally, in economics, if we of the older generation attempt to discuss economics with a victim of the past four decades of cultural-evolutionary downshift which the “services economy” generation has adopted, we are reminded, quickly, of our sense that our society has fallen back culturally, in a mere four decades, perhaps hundreds of years, to the period of the 1492-1648 religious warfare in Europe, or even the Fourteenth Century. That is certainly not a prospect which the BoBos have given us, and themselves, for a bright future for the coming generations of mankind.

Therefore, the concept of the complex domain must be faced, not only mathematically, but clinically, as we do here, whether the discussion makes the BoBos comfortable, or not.

Archytas, Plato, and Vernadsky

Use the medium of water, together with relevant, three-dimensional objects as containers, to help to illustrate the conceptual implications of the Pythagorean Archytas’ construction of the doubling of the cube, and the correlated matter of the specifically principled nature of cube roots. Compare this with what Bruce Director writes, in a companion piece, on the significance of the all-too-brief life of Theaetetus, as that life and its work were viewed by Socrates, Archytas, and Plato. As he shows, from the mouths of those who are still today, among the greatest, most significant minds of known civilized mankind’s history so far: *there are two distinct, but inseparable issues exemplified in a crucial way by that insight into the purely geometric, non-arithmetic nature of the Delian paradox. One is the physical nature of the universe in, and on which man acts willfully; the second, is the nature of man.* His report shows the way in which some among the greatest minds from the known history of science have understood the distinction and connection of those two conceptions.

Since no later than those ancient times when Socrates, Archytas, and Plato left their record of the connection between the physical universe and the nature of mankind, that connection has been the central issue, of the entire history of European civilization and its culture to the present day. In that tradition, and in that sense, modern European art and science today, have been divided into two great warring camps, two

camps typified by the opposition between the methods of the respective followers of the real-life Gottfried Leibniz, the humanists, and the synthetic identity of the figure of real-life black-magic worshipper Isaac Newton, the reductionists. This division typifies the modern expression of a millennial conflict between the legacy of Plato and oligarchical legacy of the Delphi Apollo cult.

The Delian paradox is, for a certain reason, the pivot of that great division in European history to date. For just this same reason, there is no other principled division *in the history of European culture*, from its beginnings in the rise of what we know today as Classical Greece, to the present date. However, *the division between the two principled factions*, proceeds under the long waves of development which produced the increase, or decrease of the longevity, and per-capita power over nature of that essentially unified, great stream of a civilizational process. The resulting conception of man, as Bruce Director shows the connections implicit in the development of that person of Theaetetus, as Archytas, Socrates, and Plato understood him, is the essence of that long skein of history.

These characteristics of that stream have been made more clearly accessible to modern knowledge through those global implications of the work of V.I. Vernadsky which I have emphasized again here, as in earlier published locations. The concept of the Noösphere, as I have qualified the implications of Vernadsky's greatest discovery in this and those earlier locations, has shifted the center of the known conception of scientific knowledge and practice, away from a science descended from the astrophysics of the ancients, to the process of willful self-development of man as in the image of *Genesis* 1: 26-30. The shift from a concept of man as if our species had been merely deposited to exist within a self-developing universe, to man shaping the universe, more and more, can now be seen more clearly, in a retrospective view of these recent several thousand years: as man in the image defined by the principle of *agapē*, man in the process of developing the creation which we inhabit.

I now explain, summarily, as follows, why I solicited Bruce Director's written representation of his earlier, oral presentation, as a complement to this present report.

Since its beginnings, to the present time, that European history is a continuous process, an indivisible unity, such that any attempt to define any great part of it apart from the rest, during any part of these several thousands of years, would be a hoax, whether intentionally or not. That entire sweep of history is a veritable ocean, like the oceans from which this culture sprang. It is not a fixed ocean, despite the ebbs and flows within its development as a unified process. The unifying conception, which renders this historical sweep of ebbs and flows in development comprehensible as a whole, integral process, is the notion of *power* which we have inherited, by courtesy of Leibniz, as a crucial feature, *dynamis*—the modern, Leibnizian conception of a *dynamic*, rather than *mecha-*

nistic universality—of an Egyptian legacy which had been delivered to the ancient, seafaring Greeks, a legacy known as *Sphaerics*.

As I have shown here earlier, that specific, elementary exercise in anti-Euclidean geometry, known as the Delian paradox, has a crucial feature which has divided European culture into two great factions of scientific thinking, from that time to the present day. This fact erupted to the surface of modern European civilization as the characteristic issue dividing the ranks of professional mathematicians and physical scientists into the two great, warring camps, camps represented, respectively, by the contending figures of Leibniz and, in opposition to Leibniz, those followers of the Cartesian reductionism of Paolo Sarpi et al., the form of reductionism which was later named “Newtonian” by devotees of the cult of the synthetic, neo-Cartesian personality of real-life black magic specialist Sir Isaac Newton.⁵⁴

The work attributed to the youthful Theaetetus, by Socrates, Archytas, and Plato, on such crucial subjects as the duplication of the cube and the generation of the dodecahedron, typify those elementary topics in systemic mathematical-physics thinking which separate modern European culture into the two great warring camps of those associated, respectively, with the typical names of Leibniz (dynamics) and Descartes (mechanics).

So, my associates and I have used these elements of background discussion, with those implications which I have just now summarized, to clarify the far more general concept of power (Greek: *dynamis*; Leibniz, in English: *dynamics*, *power*; in German: *Kraft*).

After exploring those and related matters which we have addressed here, on that level, thus, prepare now to expand the exploration of ideas to the higher level represented by that work of Vernadsky, which has been often referenced by me in this location, in defining the three multiply-connected physical geometries of the abiotic, Biosphere, and Noösphere.

54. See Georg Cantor, *Contribution to the Founding of the Theory of Transfinite Numbers*, Philip E.G. Jourdain, trans. (New York: Dover Publications, 1953, 1955), p. 85, where the dedication, “Hypotheses non fingo,” headlines the body of Cantor's own text. The same appears in the original German edition *Werke*, p. 282. On this matter of a then already mentally disturbed Cantor's effort to induce Pope Leo XIII to adopt Newtonianism as the foundation of the church's doctrine, take note of the way in which Cardinal J. Baptiste Franzelin, S.J., ended his exchange of correspondence with Cantor. See *Georg Cantor Briefe*, Herbert Meschkowski, ed. (Berlin, New York: Springer, 1991), pp. 254-258. Notably Bertrand Russell network associate Jourdain reflects the links of the waning Cantor to the influence of sometime associate of the pro-Satanic Lucifer cult of Russell confederate and Lucifer cultist Aleister Crowley, and founder of the Anthroposoph spin-off from Theosophy, Rudolf Steiner. The onset of Cantor's mental illness is to be chiefly attributed to his brutish persecution earlier, by a pack of rats led by Leopold Kronecker, a persecution which led the despairing Cantor into the embrace of the network of the Bertrand Russell who hated the mid-1880s George Cantor of the *Grundlagen* with the same passion Russell later hated the devastating exposure of the hoax of Russell's *Principia Mathematica* by Kurt Gödel.

Treat this work of Vernadsky as defining a revolution in the branch of studies termed “economics,” or “political-economy.”

Recognize the silliness of most doctrines of political-economy until now, both the Anglo-Dutch Liberal variety, and that offshoot of Anglo-Dutch Liberalism popularly known as Marxist political-economy. With the adoption of the idea of an economy based on the notions of simple exchange, monetary or other, economics is not, and could never become a subject of scientific deliberation, except in the sense of the troubled, self-destructive patient complaining against that primeval synonym for money, the mother, on the psychoanalyst’s couch.

All leading features of global civilization today have now been absorbed into the emergence of a global culture which is implicitly, potentially, on the way to superseding the quasi-regional character of European civilization, by what should, if permitted, emerge as an ever-more clearly defined Eurasian global culture. The fate of today’s Russia within Eurasia is, already, about to become, and would become, as Mackinder, Haushofer, and Ludendorff and his Hitlerite followers, commonly feared, the potential expressed in the image of the pivotal geographic determinant of the coming long wave of development of this planet.

The fate of the Germany, Russia, China, India cooperation in long-wave, Eurasia-centered world development, and of the Americas, especially the U.S.A.’s cooperation with that global development of all parts of the planet, will now decide whether or not mankind emerges to prosper out of this global economic breakdown-crisis of the present, neo-Venetian form of world monetary-financial system. In other words, whether the republican, or oligarchical currents traced within continuing European culture since ancient Greece, shall prevail during the weeks and months now immediately ahead.

This deeper exploration of this history has been made possible by my grasp of certain of the deeper implications of Vernadsky’s recognition of the character of the Biosphere and Noösphere, as dynamic, rather than mechanistic systems. This advantage takes us out of, and up from what had been the best prevalent notion of science heretofore, into the higher realm of investigations, a realm which I have identified as a “Fourth Domain,” where the fulsome secrets of physical space-time are no longer lost in empty space.

3. Heraclitus, Vernadsky, and the Fourth Domain

In “Vernadsky and Dirichlet’s Principle,” I emphasized the implied existence of a “Fourth Domain,” above and beyond the Noösphere as such. I clarified the essential features of the argument in terms consistent with the development of the notions of Biosphere and Noösphere as represented by the

published work of Vernadsky on those subjects. Although I defined the existence of that “Fourth Domain” adequately, as the subject itself would define “adequately,” I was nonetheless wittingly, playfully teasing my audience, provoking them to formulate the questions for which they would demand my answers in times not far ahead. Some have already done so.

To a significant degree, that has worked out as I had expected. Now, the time has come to respond to the questions I knew must necessarily arise in the minds of seriously thinking readers of that piece. As the great Classical poets and playwrights would warn you, unless you are, perhaps, a devout disciple of Zen, do not attempt to answer a question which does not yet exist in the mind of one’s audience. First, you must, as in all serious science, provoke the question in a manner which invokes the hearer’s angered encounter with an accessible, valid, knowledgeable experience of the real universe, rather than some arbitrary recipe such as the arbitrary and fraudulent monetary-financial doctrines of political-economy which dominate the world today.

On the subject of this matter, most textbooks tell lies to their readers in the fashion of Laputan sages, about the subject-matter they claim to teach. They give putative answers to unasked questions, feeding such trash, like dry, defaced crackers, to their Laputan novices. They instruct, thus, in the spirit of the inanely babbling Pythia of the Delphic cult of Apollo. Whether wittingly or not, the intention expressed by such textbooks and kindred instruction, is like the mission assigned to Pythia by the priests of Apollo sitting on the other side of the pit. The purpose of those priests, or, their like today, is not to uplift the mind of the student, but to control it. So, Baby Boomers often seek to control the future minds of the younger generation, as the old men of the tribe shackling the minds of the young in the manner of a truly Delphic tradition: “Read my lips! Fire does not exist for you to know how to use it!”

For this reason, I must therefore dread the day, when my insistence that the daytime sky is not polka-dotted, would provoke a chorus of graduates to rise in frenzied protest from their chairs, standing, seized by a wild-eyed, chorus of protest, shouting wildly, again, and again, and again, “That is not what we learned in *our* school!” You think I am mistaken in expecting some, even of that sort; you must be unfamiliar with rather typical meetings of scientific bodies!

The duty of education is not to fetter minds, but to free them of the doctrinal shackles of the mind which have recently ruined the society of today. To free them, as Frederick Douglass understood, means to imbue the habits by means of which they acquire the power to free themselves. Such is the necessary intent of my introduction of the subject of what I have designated as “The Fourth Domain.”

We might begin with the subjects of the fermenting of wine and beer, as Louis Pasteur did so famously.

Living processes produced an effect, distinguishing right- and left-handedness, which was, broadly, unknown except as

a phenomenon associated with the active presence of living processes. This line of investigation was continued by Pasteur and his follower Pierre Curie in ways which came to the surface as the concept of the Biosphere in the work of Vernadsky. For example, Vernadsky's conclusions are notably in irreconcilably systemic opposition to the blundering approach of Professor Erwin Schrödinger's "What Is Life?" essay: an essentially ideological and mechanistic treatise, whose clear intent is essentially the same defense of the Machian reductionism of Ludwig Boltzmann made by the fraudulent concoctions of the radically mechanistic, cultish follies of Bertrand Russell devotees John von Neumann on "artificial intelligence" and Norbert Wiener on "information theory."

To understand all of the kinds of matters which are principal topics of this present writing, it should be emphasized, once again, that the fundamental division within what is classified as physical science today, is between the standpoint in physical geometry typified, on the one side, by Thales, Heraclitus, the Pythagoreans, and Plato, and, on the categorically opposing side, that reductionist standpoint which pivots, throughout the history of ancient through modern European culture, around the Gods of Olympus, around Apollo's Delphi cult. The essential issue in all of this, is that the Delphic method, in all its varieties, excludes, systemically, the acknowledgment of the existence of human knowledge of the positive principles which drive the universe, just as the Satan-Zeus of Aeschylus' *Prometheus Bound* prohibited man from acquiring the use of fire.

The standard best, brief illustration of this general fact, is the outrageously scandalous case of the fraudulent astronomy crafted by the Roman Empire's neo-Aristotelean Claudius Ptolemy, for which plagiarist and hoaxster Ptolemy, among other offenses, gave a fraudulent representation of what has been lately exposed as the fraudulent character of his unacknowledged debt to that original work of Aristarchus of Samos, whose work Ptolemy desperately attempted to pervert and discredit.⁵⁵ The tyrannical condemnation, imprisonment, and torture of the Prometheus of Aeschylus' *Prometheus Bound*, is a typical model of the commonly used precedent for Claudius Ptolemy's hoax. Suppress knowledge of provable universal principles, against honest and capable discoverers no longer living, or, perhaps imprisoned like the Prometheus of Aeschylus' drama, for the purpose of shackling the mind of mankind, as the Aristotelean doctrine adopted by Ptolemy merely illustrates such widespread, Delphic models of tyrannical practices in the known portions

55. In a truly proven case of scientific plagiaristic fraud, such as the work of Claudius Ptolemy, the conclusive proof lies in the comparison of the methods employed by the respective parties. How was the relevant conclusion of each side of the dispute reached, and on the basis of which assumptions made, and provable principles excluded? Ptolemy commits two relevant, cardinal errors of method. Taking Aristotle's theological dogma as a premise for suppressing evidence contrary to that dogma, and suppressing the clearly reproducible evidence underlying Aristarchus' original work.

of the history of mankind.

So, what can be fairly described as the passionately honest Pasteur, posed the question with which he challenged science in general. He understood clearly that he was defending a distinct universal principle of life; but, he was also forcing himself, his collaborators, and their followers to address the relevant questions by the relevant standards of those experimental methods introduced to modern European civilization's thinking about science, by Nicholas of Cusa's *De Docta Ignorantia*. His work echoes the methods expressed by Leibniz and the Leibnizians of the Monge-Carnot Ecole Polytechnique, among others.

For clarification of this fact, look, once more, at the nature of cubic roots from the vantage-point of Archytas' doubling of the cube. Ask: What are the roots of the doubled cube which generate what are defined as "imaginary" magnitudes in the work of de Moivre, as also in the earlier efforts of Cardano et al.? When we consider this and related, relatively modern questions from the ancient standpoint of the Archytas' treatment of the Delian paradox, how do we explain the physical meaning of the modern notion of mathematical complex domain from the standpoint of the constructive geometric methods of Archytas and Plato? What does the obvious solution for this paradox tell us about the nature of the human mind—and of the universe in which, and upon which it acts?

He is a leading example of the point, that, the fact that we have in hand the evidence pointing to the existence of a previously unknown principle, is not in itself proof of that principle; rather, the question so posed, should drive us into seeking the evidence needed to test and explore the suspected principle. We can not deny the principle because it is not yet proven conclusively; but, neither can we assert that it has been proven, if merely on the premise of apparently strong evidence in support of that line of inquiry.

In my relatively long life of such explorations, I have often waited long, like a lurking hunter by the trail, for the unexpected evidence's expected eventual arrival. I have often done this, sometimes with the expected arrival of success; nearly always with some degree of a valuable lesson learned from the experience. For me personally, an understanding of

this need for energized, goal-oriented patience, began with the first day of a secondary school class in plane geometry, when I rejected, then, once and for all, to the present day, any set of definitions, axioms, and postulates which presumed the existence of any principles of geometry which were not coherent with *an elementarily physical geometry*.

This was a conclusion I had reached simply by observing the manner in which structural beams at a nearby Charlestown, Massachusetts U.S. naval yard were crafted for their mission, and studying, with fascination, those concoctions of seemingly fabric and wooden sticks known as typical aircraft in use in my neighborhood, during the 1920s and somewhat later. I observed, more importantly, that among those who did not reject the prescribed arbitrary notions of geometry, something in them seemed to go dead as a consequence of their induced intellectual habits on that account: there was a certain discontinuity introduced, thus, between the practical real world and the different vision of a largely illusory world of their educated habits of forming opinions.

Such is the matter I now lay before you, here.

Four Domains of Human Experience

Start the following discussion at the beginning. Some of the important, much-debated facts to be considered, are elementary in principle. Therefore, we must lay corresponding emphasis on elementary considerations.

The work of V.I. Vernadsky known to me thus far, apportioned the known totality of physical space-time among three distinct, but multiply-connected domains, which are each and all organized, internally, and as a whole, as *dynamic* (Leibnizian), rather than *mechanical* (e.g., Cartesian, Newtonian) processes: the *abiotic*, the *Biosphere*, and the *Noösphere*. On this subject, Vernadsky's known treatment of the distinctions among these three domains, is sufficiently clear respecting the first two; and his definition of the third, *the Noösphere*, is conclusive, when his definitions of relevant evidence are read in light of the method by which he clearly distinguished living from non-living processes in defining the Biosphere.

As I have stated earlier in this present location, the most notable shortfall, as expressed in the work of those sources, lies within the bounds of his correct, but inadequate definition of the universe as characteristically Riemannian. *This indicated shortfall in his known work as a whole, would implicitly prevent him from recognizing that his declared evidence requires the subsuming, determining existence of a yet higher, fourth domain.* The solution for that shortcoming in his known work becomes obvious when the dynamic organization of the Noösphere itself is viewed with the advantage of my own work in the field of a science of physical economy.

Formally, the remedy for that indicated shortfall, can be described fairly as the relevant application of what Riemann defined as his adoption of Dirichlet's Principle. This use of Dirichlet's Principle takes our attention back to Riemann's posthumously published draft "*I. Zur Psychologie und Meta-*

physik" and a crucial passage from his companion draft, "*II. Erkenntnistheoretisches.*"⁵⁶ These posthumously published notes reflect young Riemann's attendance at Göttingen University lectures by Johann F. Herbart, the latter a long-standing, highly distinguished protégé of Alexander von Humboldt, during his adult lifetime a leading adversary of the doctrines of Immanuel Kant and G.W.F. Hegel, and the most important of the influential philosophers of the practice of education in Germany and also the U.S.A. during virtually the entirety of the Nineteenth Century.

Herbart is particularly notable for his use of a concept which he termed *Geistesmasse*, which is implicitly a precursor of Riemann's later adoption of Dirichlet's Principle of physical science. The set of three posthumously published notebook writings from that period of his life, of which I have referenced two here, are significant, still today, for reasons with which Herbart would have heartily agreed. They are important still today, for the insight they contribute into the internal characteristics of the subsequent flourishing of Riemann's potential for genius under the later influence of the work of, most notably, Gauss, Wilhelm Weber, and under Dirichlet at Berlin and at Göttingen.

Herbart would have consented to my argument on this point respecting these historical, conceptual implications of the term *Geistesmasse*, notably as they bear on the related topics of Riemann's use of the related terms *Geistesmasse* and *Dirichlet's Principle*, and also on the subject of the Riemannian implications of Vernadsky's work on the subjects of Biosphere and Noösphere.

The common implication of Herbart's notion of *Geistesmasse* and Riemann's notion of Dirichlet's Principle, is that, in any well-defined domain, there is a functional distinction between an aggregate of components specific to that domain and the indivisible unity of that which unites the domain itself. This involves no essential deviation from the principle which underlies Carl F. Gauss's 1799 exposure of the hoax intrinsic to the common, reductionist arguments of the empiricists D'Alembert, Euler, Lagrange, et al.

In Vernadsky's configuration of the respective abiotic, Biosphere, and Noösphere domains, there is an essential discontinuity which separates the abiotic from the superior domain of the Biosphere, and, similarly, the Biosphere from the relatively superior domain of the Noösphere. Relative to the inferior, the action which distinguishes that inferior domain from the superior, is viewed ontologically from the standpoint of the inferior as simply a discontinuity of the type of an infinitesimal, but also as a functionally significant discontinuity when effects are taken adequately into account. From the physical standpoint of the higher domain, that relevant discontinuity is manifest as a universal physical principle: e.g., a principle of life, or, in the instance of the

56. *Werke*, pp. 509-525. N.B. his notes on Isaac Newton, p. 525.

Noösphere, of cognition.

Hence, if we could assume that Euler would cling to his argument against Leibniz, when he might have turned to the domain of biology, he would have insisted that a principle of life does not exist to distinguish the state of death, or, like Frederick Engels, would deny the existence of a discontinuity separating man from the ape.

Thus, in Vernadsky's account of the organization of the Biosphere,⁵⁷ the materials of which the parts encountered in the Biosphere are composed, differ essentially only in their mutual organization as compound processes within the domain of living action, and so forth, from the elements on which the organization of the abiotic domain is ostensibly premised. To restate that point: It is the dynamic organization of the process of the Biosphere which differs from the organization of the process of the abiotic domain into which, and from which the components of the Biosphere-process flow.

This is the issue on which the speculations on the subject of life by Schrödinger, depart the domain of reality presented by Vernadsky.

The difference between the Biosphere and Noösphere, as viewed from the vantage-point of the Biosphere as such, is of the same principled character, except that the principle itself is different.

Vernadsky adds to that the crucial additional matter of physical evidence, that there is a characteristic increase of the accumulated product of the Biosphere relative to the total abiotic domain of the planet, and that, similarly, there is an increase of the accumulated product of the Noösphere relative to both the Biosphere and, hence, of course, the mass of the planet Earth as a whole. Hence, the qualitative specifics not only exist; each has a characteristic specific outcome, as expressed in the form of changes in the composition of processes in the relative universe as a whole.

In face of this and kindred general evidence, it has never been possible to define the universal physical principle of life in terms of the abiotic domain, and never possible to define, in terms of biology as such, the source of the increase of the potential relative population-density of the human species relative to the aggregate historical accumulation of other living processes. Yet, the same evidence shows that the principles of life and of cognition are, nonetheless, efficient universal physical principles in our universe, that in spite of the obvious requirement of appropriate preconditions for their localized expression.

On the latter account, the same principle of cognition whose existence is systemically denied by reductionists, as typified by the empiricists, is not a principle confined within the processes of the Noösphere; it is the principle which subsumes the Noösphere, as the principle of life subsumes the discontinuity distinguishing the Biosphere from the bare

abiotic domain. This distinguishing superior principle of the Noösphere's processes, is of a character belonging to the same general form of universal principle as what Riemann defines as Dirichlet's Principle.

In certain relevant circles, this superior principle, which distinguishes the Fourth Domain, is known as an expression of the personality of the Creator, or the principle which defines the ontological quality of the Creator as a self-subsisting positive principle, *a principle of creation which underlies the universe as a whole*. Apart from the significance of this point within the province of theology as such, this defines that sovereign nature of the human individual which sets the human individual above the beasts. In other words, the individual person made in the essential ontological image of the efficiently willful Creator.

As the expression of life occurs in its organization of the subsumed processes which the living organism shares with, exchanges with, the abiotic domain, so the expressed existence of the human mind is met in the integral organization of the subsumed living and abiotic processes. However, as the living organism is distinct from the processes which its existence as an identity subsumes, so the presence of the human mind is expressed as the organizing principle corresponding to the implications of Riemann's identification of Dirichlet's Principle.

The subject does not end within those bounds. *This nature of the individual person can not be set apart from the role of that individual as an integral part of an historical-social process of cognitive interaction within society.*

The Power of the Higher Complex Domain

The discontinuity which separates each of those domains from one another, the Biosphere from the abiotic, and the Noösphere from the Biosphere, and the Fourth Domain from the Noösphere which it subsumes, is of a quality which parallels the ontological implications of the *complex domain* of standard mathematical-physics in a certain distinct, but meaningful sense.

For clarification of this fact, look, once more, at the nature of cubic roots from the vantage-point of Archytas' doubling of the cube. Ask: What are the roots of the doubled cube which generate what are defined as "imaginary" magnitudes in the work of de Moivre, as also in the earlier efforts of Cardan et al.? When we consider this and related, relatively modern questions from the ancient standpoint of the Archytas' treatment of the Delian paradox, how do we explain the physical meaning of the modern notion of mathematical complex domain from the standpoint of the constructive geometric methods of Archytas and Plato? What does the obvious solution for this paradox tell us about the nature of the human mind—*and of the universe in which, and upon which it acts?*

Now, from that standpoint, what does all this have to do with that famous aphorism of Heraclitus to which we have been making repeated reference in this presentation thus far?

57. LaRouche (see note 36).

To those ends, proceed as follows.

Physical functions whose mathematical-physical representation deserves expressions in the form of the complex domain, as Gauss clarified this in 1799 and later, tell us something essential about the relationship between that which sense-perception reports concerning the experienced universe “outside our skins,” as compared with what our mental-perceptual apparatus tells us about that experience. *In short, that which followers of Paolo Sarpi such as Sarpi’s house-lackey Galileo Galilei, Sir Francis Bacon, Descartes, John Locke, the Physiocrats, Euler, Kant, the positivists, the neo-Kantians, and the existentialists, et al., would wish to defame as “imaginary,” is the most real aspect of that experience, the only part of the experience which is qualitatively human!*

The duplication of the cube by Archytas’ construction, is a *physical action* of the quality which the Classical Greek Sphaerics of Thales, Heraclitus, Pythagoras, Archytas, Socrates, and Plato recognize as the principle of *dynamis*, the ancient expression of what Leibniz defines as dynamics, in opposition to that mechanistic method of Descartes, on which the Eighteenth Century’s professed empiricists premised their attempted defense against Leibniz’s exposure of their sundry blunders and frauds. The answer lies in closer scrutiny of a quality of *action*, which Leibniz and his followers identified as that quality of *power* which is to be associated with the performed action which expresses a universal physical principle.

Human sense-perception does not “see” the principle as a sensory object of the ordinary types. Human sense-perception sees an *apparent ontological discontinuity*. This type of discontinuity has the apparent form of a true infinitesimal, as Georg Cantor, in his better moments, such as in his production of his *Grundlagen*, understood the ontological form and formal implications of such discontinuities.

There is an “object” there; but we do not see it. We see a place, a place where the object’s existence is expressed. We “see” an object which corresponds to Heraclitus’ notion of change as an object. Mere sense-perception does not recognize any universal physical principle; only the higher cognitive powers of the human mind could do so. Thus, wherever such a true discontinuity might be expressed by such a true infinitesimal, there is a function to be represented, a process to be represented. The students’ experience in replicating Archytas’ doubling of the cube. is an outstanding experimental demonstration of the existence of the relevant connections.

To restate that pivotal point of the presentation at this point: *That pedagogical experience, the replication of Archytas’ solution for the Delian paradox, is an example of a direct experience of the conception to be associated with the famous formulation by Heraclitus.*

As I have emphasized repeatedly in the course of this report until now, the real universe is a universe composed of

forms of action corresponding to *powers*, powers which are not expressed as fixed objects of naive sense-perception, but as a process of change. By “change,” we should recognize a process of transformation according to a principle which has the quality of being a power. It is a power of ontological change, such as, for example, the constructed doubling of the cube.

That is what the universe does. That is what human beings do willfully, as other living species can not. The science of physical economy, my specialty, affords us the best, most general, and also most relevant demonstration of that principle.

The Science of Physical Economy

In physical economy, we experience two contrasted classes of productive change in the environment.

In the one case, we have changes which are of the form of actions which apply an already established principle of human practice. In the other, contrasted case, we introduce a new universal principle to practice. In that latter case, we are experiencing the quality of effect which is typified by the role of scientific and technological progress.

Both qualities of changes are characteristic of the Noösphere; the second represents qualitative, or *anti-entropic* changes in the rate of self-development of the Noösphere. The science of physical economy, which is the science underlying any competent analysis or practice of political economy, is based on consideration of the effect of the occurrence either of these actions, or of the lack of such actions.

In physical reality, there is no inherent physical-economic profitability in a society which practices “zero technological growth”; any such society, any such economy is inherently entropic, and ultimately doomed by its policy of practice. *Any method of accounting which professes to perceive actual, or potential profitability in a zero-technological-growth economy is either ignorant, or fraudulent. Any society which adheres to the intention of zero technological growth, is dying and rotting, as we have seen in the North America and the United Kingdom during the recent thirty-five years, and in continental Western Europe for more than a quarter-century.*

On this account. Albert Einstein’s remark, that the universe is “finite, but unbounded,” should be corrected to read, “finite, and self-bounded.” My proposed correction is, most probably, completely in accord with his own intention; however, we must consider the way in which his statement would probably be read by others.

There are four gross strata of a national (or, world) economy which are of indispensable, if relatively superficial, crucial importance for understanding even the bare rudiments of a national economy. The first is the Biosphere, including its fossil elements, in respect to its relative state of depletion and development, relative to a prior condition. The second is the fossil elements of the Noösphere, including their relative state of depletion and development. The third is the development

of the state of the non-fossil elements of the Noösphere, including the development of the human mind. The fourth is the rate of progress of those combined phases, as chiefly determined by the practiced state of cognitive development of the human mind of all strata of society. *The combined progress in discovery of principles and the realization of improvements based on continued discovery of such principles, are fairly described as a statement, of first approximation, of the self-bounding state of an economy.*

The relations among those typical categories of components are never mechanistic, but are *dynamic* in Leibniz's sense of that term.

The underlying, functional characteristic of the indicated set of relations defining a self-bounded and anti-entropic economic process is expressed as the combined rate of accumulated progress of society in discovery, and realized application of accumulated knowledge of fundamental physical and related principles. That essential quality of effect is defined essentially by the cumulative discovery and realization of universal physical principles affecting all of the general categories indicated immediately above.

In broad terms, that means that the health of the economy is a function of its rate of upshift in directions determined by fundamental progress in discovered and applied knowledge of universal physical principles. This can be restated as the relative anti-entropy of the process as a dynamic whole.

As the examination of the history of progress and decline of the recent, approximately three thousand years of the evolution of European culture, illustrates the crucial point to be emphasized here, it is those ideas which are congruent with that notion of powers associated with Pythagorean and Platonic Sphaerics, which is the essential accumulation of human capital, as measured in replicatable re-enactment and additions to the discovery of principled ideas (powers), which is the driving force of human progress. It is the process of transmission and addition of the stock of such ideas which is the determining feature of the history of culture, and of what may be termed descriptively as economy. Here lies the tangible demonstration of the specific quality of immortality which is embodied in the mortal human individual.

It is the discovery, transmission, and application of ideas of the quality of powers, which are the essence of the continuing history of the human species and its cultures.

Existence and Ideas

The characteristic of the Fourth Domain, as a domain, is limited essentially to the function of those powers which we associate with the principle of dynamics as associated with Sphaerics. In other words, actions are essentially subsumed expressions of efficient universal physical and congruent principles, principles of the ontological quality of *powers*. In other words, the Fourth Domain is essentially a domain of ideas, as the notion of powers typifies efficient ideas.

These ideas occur as objects of perception only in their

guise as discontinuities within the sense-perceptual domain. They are the discontinuity corresponding to the action associated with universal principles, which bridges the gap—the apparently infinitesimal space—between the two points of before and after the relevant apparent discontinuity.

On this account, the human individual has two forms of existence: On the one hand, as the mortal, animal-like living form. On the other hand, the efficient role of that individuality as a permanent (e.g., immortal) *link of action* within the process of unfolding ideas on which the progress of humanity depends.

This connection is expressed in its poignant form by such mortal cases as that of Jeanne d'Arc, whose action, for which she was burned alive, defined a crucial consequence in the European existence. The connection is made to kindred effect, on account of principle, by the generation and transmission of discoveries of universal physical principles. Such actions define the individual, who were otherwise seen as like a mortal animal, as immortal, by virtue of a personal identity which was expressed by the mortal human individual's relevant action, but an identity not limited by the mortal biological existence.

Morally matured individual persons recognize that distinction in practice, and acquire thus a sense of personal immortality which inhabits the mortal individual as both a motive and a sense of personal interest in immortality.

However, this sense of immortality is not only social, but depends upon a sense of participation in the principle of action which governs the universe, and a corresponding loyalty to the Creator, which governs the universe through the expressions of the Fourth Domain.

The sense of personal accountability which such a notion of immortality demands, is inseparable from the notion of truth, as scientific truth illustrates the point. This means truth as defined by loyalty to the principles of Life and Cognition. Life and Cognition, truthfully sought out and served, are the hallmarks of the social individual's immortality. These are notions of an individual's sense of a participation in the Creator which is uniquely human, and inevitably social. It is that which underlies, and which is expressed by the principle of *agapē*.

Without such devotion, the human individual approximates, more or less, the Yahoo of Jonathan Swift's Parable, or, the same thing, a creature in the mold of the Sophists of self-doomed ancient Athens, and the financially predatory strata of our society today. Without such devotion, there is no true morality, and, indeed, no truth at all.

The Fourth Domain is no fantasy; it is the only real place in our universe which is a fit place in which a morally and intellectually matured human individual would wish to live. It is the place in time, where, as if in Raphael Sanzio's famous *The School of Athens*, immortal human beings, such as Raphael himself, would choose to conduct the struggle in whose history he actually lives.