

## The issue of mind-set

by Lyndon H. LaRouche, Jr.

*This article was written in commemoration of the 80th birthday of Prof. Grigori L. Bondarevsky, member of the Russian Academy of Social Sciences.*

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Those among us still active, after fighting in political wars for the past half-century or longer, have access to a relatively unique and invaluable store of personal experience. To us, it is all too obvious, that ours is an experience commanded by virtually none among those, mostly a generation or two younger than ourselves, who occupy most of the leading public and private positions today. Today's still-active elder statesmen, born during or shortly after the great war of 1914-1917, have lived through such times as: the onset of the Great Depression and the ensuing wars; the needless dropping of two nuclear bombs on the helpless civilian population of Japan; the prolonged threat of global nuclear conflict; the collapse of the Soviet Union; and, now, an Anglo-American-dominated world, which is toppling, like some self-doomed Ozymandias, at the brink of the worst, most awful financial collapse in more than a hundred years. With that present financial crisis, has come the recent and presently escalating eruption of forms of warfare and related conflict which now threaten to escalate world-wide. We veterans, especially those among us still on duty, often wonder if those younger folk in charge of most posts today, will learn, in time, the urgently needed lessons from the results of the tragic blunders committed during today's preceding century.

From the vantage-point of that past century's experience, the most dangerous fools in positions of great influence today, are those in power who are acting chiefly out of blind faith in the presently prevailing delusions of what the late Walter

Lippmann sought to redefine as public opinion.<sup>1</sup> In the U.S.A., for example, these are the induced delusions expressed not only by such obviously defective personalities as Presidential pre-candidates George Bush and Al Gore, but, so far, by the current government as a whole, by most among the major electronic and print media, and most among today's upper twenty percent of family-income brackets. Today, theirs is the delusion, that perceived recent trends in general policy and practice are now the inevitable trajectory into the future, a fantasy which they defend as appearing to correspond to their view of a recent quarter-century of experience.

Theirs is an elementary fallacy of composition: those encumbered by that latter delusion, ignore the leading facts of the entirety of the just-concluded century.

They ignore that fact, that the march into the great war of 1914-1918, was a trend established with that successful 1901 assassination of U.S. President McKinley which brought Theodore Roosevelt into power in the U.S.A. They overlook the lessons of the decade-long triumph of the predators' ball called the Treaty of Versailles, which led the victors to bring Adolf Hitler into power in 1933, and made the war of 1938-

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1. Lippmann's definition was one of many proposed revivals of the pagan Roman definition, of what is known in modern European tradition as Romanticism, as opposed to the Classical Greek heritage. Notable precedents for Lippmann's doctrine include: the irrationalist doctrine of public opinion promulgated by Immanuel Kant, and the neo-Kantian doctrine of law of G.W.F. Hegel's Conservative Revolution ally, Professor Karl Savigny. Lippmann's role in this, was to redefine the manner in which such public opinion was to be created, as a method of mass mind-control, under the special circumstances of Anglo-American-dominated, post-Versailles-Treaty Europe and the U.S.A. The use of a mass media itself controlled by the Anglo-American financier oligarchy, e.g., Project Democracy today, is a specific characteristic of Lippmann's scheme.



*The late Dr. Robert Moon, a physicist, working with children to construct apparatus to carry out the experiments of A.-M. Ampère. "The cognitive relationship among different generations of the living," writes LaRouche, "is the bridge to a kindred, living relationship to all humanity, past and future."*

1945 inevitable, once the deaths of Kurt von Schleicher and Hindenburg made Hitler's dictatorship an absolute one for the decade which followed. Similarly, the combined impact of the 1962 nuclear-missile crisis, the war in Indo-China, and the assassinations of President Kennedy, Martin Luther King, and Robert Kennedy, combined with the delusions of "détente," led the world into a new trend of the 1970s, 1980s, and 1990s, in which the Soviet Union was shattered. Wishful dreamers of today overlook the fact, that the Anglo-Americans gathered around a foolishly triumphant Thatcher and Bush, unleashed, full force, those follies of economic policy which have now brought not only Russia, but also NATO's triumphalists of 1989-1992, to today's brink of financial, and also economic self-destruction.

The primary lesson of modern history, is that the greatest follies of nations unfold over periods of one or two generations. There was no great folly in history which was not the ruling opinion of a decade or longer; the greatest follies are the generally accepted delusions which wreak havoc on their believers a generation or so after they have become ruling policy-shaping trends. Thus, often, there is no greater fool today, than the man of fifty to sixty years of age, or younger, who bases his or her opinion on the taking of his perceived experience of his adolescent and adult lifetime as proof, that a currently prevailing trend in opinion-shaping is axiomatically a correct choice.

The greatest follies of all known human history, even before modern times, have been the fruit dropped from a

generation or more of stubbornly prevailing trends in official public opinion. There is no greater fool, than is usually to be found among those leaders of today's nations, who imagine that the utopian delusions of "globalism," the induced prejudices peculiar to their generation, are axiomatically the work of a triumphant empyreal wisdom. So, the generational and related cycles of true-life tragedy of nations unfold.

Now, once again, the currently prevailing trends in global economic policy, are pushing the world as a whole into not only spreading warfare, but the threat of a collapse of the

## Contents

1. The global financial crisis	14
2. "Anti-Euclidean political geometry"	16
3. The idea of cognition	19
How cognition is suppressed	21
4. Knowing distinct cognitive ideas	23
How time discredited Euclid	28
5. Man and nature: physical economy	32
The modern nation-state	33
The Renaissance as a revolution	36
Physical economy as such	40
Science, economy, and education	42
6. Personal identity and culture	44

planet into a prolonged new dark age.<sup>2</sup> In this situation, the deluded, triumphalist breed lately come to power, is disposed to negotiate almost any conditions, but that foolish economic policy, such as their own policy of “free trade” and “globalization,” which is the driving force behind the cascade of war and related conflict today. Like that self-doomed Democratic Party of Athens, which perpetrated the judicial murder of Socrates also in the name of “democracy,” today’s self-styled “democratic” and other predators are as much, or perhaps more than their intended prey, in the grip of the doom to be brought about by their own foolish arrogance. So, as Percy Shelley warned in his *Ozymandias*, does tragedy purge history of its current crop of reigning fools.

What I have just described is not a novel view of the principles of prudent statecraft. All of the greatest compositions of Classical tragedy, as in the tradition of Aeschylus, Sophocles, Shakespeare, Schiller, and Pushkin, together with the commedia of Dante Alighieri, Boccaccio, Chaucer, Rabelais, and Cervantes, have served the most intelligent actors and audiences as lessons in those same true principles of history to which I have referred by recent examples, here. The principles of composition underlying the greatest Classical poetry, have also been, in similar ways, conveyers of wisdom of this same kind to the cultivated minds among both the greatest statesmen and the more intelligent and moral among the broader layers of the population.

The study of Classical tragedy guides the prospective qualified statesman to avoid the kinds of folly perpetrated by the triumphalist arrogance of Aeschylus’ Zeus, or of a Hamlet who refuses to accept the evidence, that his own survival, and that of his kingdom, too, would be doomed if that Hamlet refused to abandon his customary ways. This point is recognized among all cultivated minds. Once that type of problem is recognized, the remaining question becomes: Is there some general principle, akin to a universal physical principle of science, which should guide us in avoiding new tragic errors of the same type to which I have referred as examples from the pages of Twentieth-Century history?

To answer that latter question, let us look first at the strategic situation of Russia today from that vantage-point.

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## 1. The global financial crisis

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Thus, Russia today lives in a world which, in its entirety, hangs over the edge of a precipice. It is a world whose reigning powers, and also many others, are clinging to their follies,

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2. This notion of a *dark age* references the collapse of the Roman Empire in the west, the mid-Fourteenth-Century collapse of European civilization resulting from the Fourth Crusade, the Mongol invasion, and the subsequent triumph of the Guelph League, and the approximately century and a half of religious wars, from approximately A.D. 1517 until the 1648 Treaty of Westphalia.

hanging so at the brink of a self-doomed global financial and monetary system. Exactly when that financial system will disintegrate, is uncertain; all that is certain, is that that disintegration will strike the entirety of this planet soon. The collapse could occur in one or a combination of several possible ways: an hyperbolic deflationary chain-reaction collapse; a hyper-inflationary, chain-reaction blow-out, with some of the characteristics of the disintegration of Weimar Germany’s experience of Spring through Autumn of 1923; or, the effects of sundry wars and kindred sorts of social conflicts; or, some combination of such developments. Exactly which of those options is the most probable outcome, or exactly when that outcome will erupt, is still somewhat uncertain. Nonetheless, what is already clear, is the increasingly turbulent ricocheting among those choices; that increasing turbulence is itself the clearest sign that the present world financial and monetary system has already entered the critical phase-shift, the terminal phase of a global systemic, not cyclical crisis.

In fact, a growing number, if still a minority, among senior observers, have lately pointed to the fact, that belief in the continuing nominal expansion of the U.S. economy, is a deadly self-delusion. Such is the delusion of a maniacal collection of fools who are behaving today as did their pathetic predecessors of the Seventeenth and Eighteenth Centuries, who plunged to their personal economic ruin in the Netherlands’ tulip bubble, and the John Law-style bubbles of Britain and France. In terms of relative and absolute numbers, the present bubbles are worse than at any known earlier point in modern history, and the credulous dupes more foolish, more fanatically self-deluded than in any comparable earlier case from modern history.

At this moment, fools, including most among the leading spokesmen for the G-7 group of governments, and most U.S. Presidential pre-candidates, too, are still gripped by the potentially fatal delusion, that the U.S. economy is enjoying boisterous, even virtually unstoppable growth of a form inhering in a post-industrial, post-nation-state utopia.

Globally, from the current press reports, one reads and hears the infantile litany, that the hope for the future of Russia, as of other already looted nations, lies in securing a stateroom in that sinking ship known as today’s International Monetary Fund (IMF) system. Yet, if one were the rarer, sane observer of these developments, the raw physical-economic data on so-called Gross Domestic Product, when that physical data is priced against current monetary and financial categories, shows a world economy which is already hopelessly bankrupt, a bankrupt kept from immediate foreclosure solely by his repeated acceleration of his taking of unpayable, imminently hyper-inflationary masses of new indebtedness.

Thus, the financial, monetary, economic crisis gripping the world as a whole today, is not a so-called cyclical crisis, but, rather, a systemic crisis, a trajectory leading toward an inevitable general disintegration of the existing world system. This disintegration will soon occur, unless the system itself

is dissolved and replaced, before the presently ongoing, terminal phase is completed. There is no possibility that the present world system could outlive this presently accelerating crisis. There is no reform, within the bounds of the axiomatic features of the post-1971 "floating exchange-rate" monetary system, which could enable that system to outlive the presently accelerating increase of the rate of turbulence in that world system as a whole. The only available choices are either a radical reform, adopting a new world system, or a descent of the entire planet into a prolonged, global "new dark age." Either some nations band together, to declare the present system in bankruptcy reorganization, and establish a new system of proper characteristics, or a descent into a new dark age, globally, is now inevitable.

That new system must be one which incorporates a repudiation of all post-1971 changes in global financial, monetary, and trade policies, and the sudden adoption of a new monetary order, based on the principle of sovereignty of nation-states, with the fixed rates and the principled other economic-protectionist features of the pre-1959 system. The principal difference between the characteristics of that former system, and what must be adopted by emergency action now, is the inclusion of Russia, China, and India as among the keystone powers ensuring general representation of the so-called developing nations generally. Otherwise, unless such sudden, emergency changes are made, the civilization which had barely survived the follies of the Twentieth Century, is presently doomed to a plunge, soon, into a global new dark age.

Think of the dominant political powers of today's world as echoing the tragedy of Shakespeare's Hamlet. As Hamlet's celebrated Third Act soliloquy typifies the principle of tragedy involved, it is the leading powers' stubbornly foolish refusal to change their own axiomatic assumptions of policy-shaping practice, which threatens to see them carried, as political corpses, off stage, in the closing scene of the coming final act.

So, on Shakespeare's stage, situate the recent years of the history of the former Soviet Union and Russia today.

It was, principally, foreseen economic processes which engendered the social and political forces behind the successive, internal breakdowns of the Warsaw Pact and Soviet Union over the 1989-1991 interval. The principal G-7 powers rejoiced at the Soviet system's calamity, but showed no comprehension of how and why that had really occurred. Like true, manically demented sports fans, like foolish Roman officials leading the cheering for the temporarily surviving gladiators of that day's arena games, the predators reacted as triumphantly as self-doomed vultures, as they swooped down into the historical trap presently awaiting them.

So, led by the predatory Prime Minister Margaret Thatcher: Britain, President George Bush's U.S.A., and President François Mitterrand's France, acted with the intent either to prevent the reunification of Germany, or to impose measures, such as the Maastricht agreements, which would ensure

the destruction of Germany's prospective role as a successful leading participant in the economic development of the states of eastern Europe. This action was complemented by related measures, including the accelerated looting of the former member-nations of the Warsaw Pact, and a general practice of imposing "free trade" upon Russia for the purpose of looting that nation, and its primary natural resources, into a state of economic ruin, and ultimate disintegration. Prime Minister Thatcher's orchestration of what became known as "Desert Storm," was an integral part of the same strategic operation. Following "Desert Storm," a series of Balkan wars, orchestrated chiefly from Britain and France, continued the same strategic effort.

The inevitable result of such a NATO- and G-7-directed orgy of "free trade" and "democracy," was the accumulation of an increasingly explosive potential inside Russia, a potential which showed itself in the successive developments of the 1999 NATO war against Yugoslavia, and the subsequent unleashing of London-sponsored mercenary forces into Dagestan and Chechnya. The reaction to this was an impulse, a nationalist reflex-action, to unify Russia around the idea of "drawing a red line in the sand" in Chechnya. The issue was not Chechnya; the issue behind the spectrum of Russia's reactions, has been the continuing, post-1989 pattern of NATO and IMF actions, a revival of the Nineteenth-Century British imperial "great game," pushing a Russia threatened with extinction, harder and harder, against the wall.

On the public record, this is a situation which I foresaw as a likely and dangerous alternative, even much earlier than a relevant Washington, D.C. meeting of February 1982. It

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Prof. Grigori L. Bondarevsky of the Russian Academy of Sciences' Institute of Social-Political Studies, celebrated his 80th birthday on Jan. 25. He has advised Soviet and Russian governments for many years on oriental affairs. He is the author of 27 books and pamphlets, and many articles, on subjects ranging from Central and South Asia to the Caucasus and the Persian Gulf, on British imperial policy in the Near and Middle East, and a seminal work on the Baghdad-to-Berlin Railway. He is a recipient of the International Nehru Award, and other highest honors from the government of India. He was elected to the Russian Academy of Social Sciences in 1995.

*EIR* published an interview with Professor Bondarevsky, on the Eurasian Land-Bridge, on April 7, 1995.

was a danger against which I warned in a televised Berlin press conference of October 12, 1988. It is a result which I have constantly worked in the effort to forestall, inside and outside Moscow, since November and December 1989. Any discussion of the present situation which does not define all features of the situation in terms of not less than an approximately ten-year process, a process situated in the developments of the entirety of the preceding century, is worse than silly babbling.

In Classical compositions of tragedy and commedia, the doom of a nation, or of a leading figure, or current of that nation, is presented to the audience, as catastrophe which might have been averted by an appropriate act of will. The tragedian demonstrates to the audience, that not only was the doom foreseeable, but also that that doom might have been averted by means of knowledge within the reach of the self-condemned victim on stage. Only such cases, on stage, or in real life, are subjects of Classical tragedy. In the case at hand, the case of the threatened plunge of current civilization into a looming new dark age, we have what Classical tradition truly defines as a tragedy of this type.

If I, for example, consider the cases of Russia or the U.S.A. today, I have in hand sufficient knowledge of the circumstances of both, to outline, for each case, how a tragedy should be composed for the stage, in the tradition of Aeschylus, Sophocles, Shakespeare, and Schiller, on either or both of those subjects for the stage. In each case, or the two combined as one, the doom is not inevitable, but is nonetheless almost certain, if the prevailing mind-sets of recent years, especially the recent three to four years, were to persist. I could thus compose the tragedy of President William Clinton, or of the U.S.A. as a whole. Despite all that I do not know of Russia, I know enough of Russia and its situation, to reach accurate judgment as to how today's potential tragedy of Russia might be composed for the stage. Obviously, as Aeschylus, Sophocles, Shakespeare, and Schiller understood, the function of composing Classical tragedy, is not to gloat over the prospective doom of the principal subjects, but to show how such impending doom might still be averted. Such lessons, delivered to the Classical stage, present doomed subjects of the past as lessons for the making of a happier future. The real subject of Classical tragedy is to use the lessons of principle adduced from previously established cases, as counsel to the present and future.

In all cases, on the Classical stage, or in present-day life, the subject of tragedy is the fact, that the doom which a nation may impose upon itself, is always a product of some defect in what is termed the *mind-set* of either the principal character, faction, or population in general, sometimes all at once. It is from this same Classical standpoint, that the more mature statesmen of today must warn their foolishly self-intoxicated juniors, against the doom inhering in the presently typical, persistent follies of the presently ruling strata in power. This is not merely a matter of art, as art is customarily defined in

academic studies. It is also a matter of scientific method.

Let us examine this connection from the standpoint of the current, and accelerating strategic conflict between Russia and the U.S.A. I compose this report's proposal from my present status, as a U.S. Presidential pre-candidate of the anti-racist faction of my republic's Democratic Party. Let us array the evidence as might be needed to assess the potential tragedy lurking in the recent decade's trend of relations between the U.S.A. and Russia, especially the worsening of that trend during the recent two years.

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## 2. 'Anti-Euclidean political geometry'

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This view of Russia's situation relies upon topics of scientific method which are specific to my specialty, physical economy, on which I have reported in various locations over past time. However, since my subject here is of leading interest to many who may not be familiar with relevant features of my work on the subject of that method, I must include the relevant clarification as an integral part of this report. I summarize the method first, and then its application to today's topic. The issue of method is elementary, but not simple. Therefore, we proceed as follows.

As Plato's Socratic dialogues demonstrate the principle, man is set apart, empirically, from and above all other species, by a faculty most usefully termed *cognition*. The relatively simplest examples of what the term cognition should signify, are found in the way in which the greatest masters of modern physical science have repeatedly exposed and overturned fruits of the habitual follies of formalist mathematicians and logicians. The most celebrated illustration of the point, is the case of the internal history of the development of modern anti-Euclidean geometry.<sup>3</sup> The most celebrated such instances include the Kepler-Gauss refutation of the axiomatic features of the linearized physical doctrines of Galileo, Newton, Euler, Cauchy, et al., and the related, contrary history of the replacement of naive belief in an allegedly self-evident principle of shortest distance, by both the Fermat-Huyghens-Leibniz physical-experimental principle of shortest time, and Leibniz's extension of this to his experimental principle of universal least action.

The formalist assumes that, if not all discoveries of mathematical physics were actually, originally discovered at the mathematics blackboard, they could and should have been

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3. That usage of the term *anti-Euclidean*, follows the argument of Göttingen University's Abraham Kaestner, the teacher of Carl Gauss. From Bernhard Riemann's 1854 habilitation dissertation (see note, below), the usage *anti-Euclidean*, rather than the more ambiguous *non-Euclidean*, becomes mandatory. Rather than adding some innovation to the set of *a priori* definitions, axioms, and postulates of Euclidean teaching, all such aprioristic elements are eliminated.

derived by the latter means.<sup>4</sup> In modern times, the absurdity of that formalist, or so-called “ivory tower” mathematics, was pointed out by Nicholas of Cusa’s founding of the modern experimental physics of Pacioli, Leonardo, Kepler, et al.,<sup>5</sup> and by Kepler’s unique empirical proof, in his *New Astronomy*, of the elementary fallacy of the same fatal error of mathematical assumption commonly included in the work of Ptolemy, Copernicus, and Tycho Brahe.<sup>6</sup> The outcome of the physics-oriented current, from Cusa’s *De docta ignorantia*, through Kepler, Leibniz, et al., is centered in the anti-Euclidean geometry of Carl Gauss and his follower Bernhard Riemann. Consider the relevance of Riemann’s revolutionary 1854 habilitation dissertation, not only for a relativistic physics, but to the underlying assumptions governing social relations.<sup>7</sup>

As Riemann sets this forth in the opening three paragraphs of his habilitation dissertation, the crippling fallacy of the teaching of geometry up to 1854, lay in the stubbornness of blind faith in the presumed, *a priori* existence of certain so-called self-evident axioms respecting space, time, and matter. Beginning with Nicholas of Cusa’s introduction of the concept of the mathematically transcendental, in his criticisms of the error in Archimedes’ theorems on the squaring of the circle,<sup>8</sup> continued through the discoveries of Leonardo da Vinci and Kepler, and the discovery of the principle of least time and least action by Fermat, Huyghens, Leibniz et al., conclusive physical proofs showed that the attempt to derive the theorems of physics from aprioristic Euclidean or kindred axioms, was in plain error. Typical was the error of assuming Galileo’s linear scheme of “action at a distance.” The Seventeenth-Century refutation of empiricists such as Galileo, by the proof of the principle of least time, for refraction of light, pointed the way toward a relativistic physics free of so-called self-evident, “ivory tower” axioms.

The development of the universal principled notion of least time, and then of least action, for physics, reminded modern science, that all of those experimental principles which we are justified in regarding as universal physical principles, have their origin in precisely the place Plato had shown, in the Socratic method of cognition as such. All valid-

atable universal physical principles, have been generated as non-deductive solutions to those paradoxes whose source of error was the application of previously established belief to physical processes. In the case, that no deductive solution to that paradox were feasible, only the generation of the notion of a new principle, such as universal least time for refraction of light, enables us to correct the relevant erroneous doctrines of physical science. If that discovery of a new principle is validated by means of what Riemann’s method distinguishes as a *unique* experiment, the proposed universal physical principle is to be accepted as validated.<sup>9</sup>

Commonly, the argument which the empiricists and other formalist opinion pit against the view I have just expressed, is the assertion, that the act of individual cognition, so defined for the case of discovery of universal physical principles, occurs beyond the scope of sense-perception, within those bounds of the sovereign individual intellect which are opaque to the sensorium. Hence, the empiricist’s and existentialist’s customary denial of the knowable existence of cognition as such, and Kant’s specific argument, against the existence of knowable truth.<sup>10</sup> The formalist’s objection falls, thus, immediately into the category of sophistry. The proof that that objection of the empiricists, followers of Kant, et al., is a mere sophistry, can be summarized as follows.

If our senses, admittedly, do not permit us to look directly into the cognitive processes of another individual mind, we are nonetheless able to know exactly the nature of that act of discovery which has occurred in another individual mind, by re-enacting that discovery within our own mind, and by our sharing of the experimental proof of that principle so discovered. All competent scientific and related education is based entirely on that method of practice. This is the proper clinical significance and usage of the term *insight*.

Good teaching, for example, provokes the pupil into replicating the original act of discovery, as this act occurred within the sovereign cognitive powers of an individual original discoverer, from generations, even centuries earlier. Once pupils have shared that induced experience of a re-enacted discovery of universal physical principle, and also share knowledge of the experimental validation of that discovery, the state of mind which each sharer has experienced in those instances, becomes a willfully replicable, and therefore mutually knowable object of thought, even though no sense-perceptual image of that thought itself were possible.

9. Contrary to the folly of today’s so-called mathematical modellers: It is not sufficient that the discovered hypothetical principle be demonstrated experimentally. The principle must be experimentally valid in its own terms, of course; but, it must also be experimentally reconciled with all other known principles which might have relevant bearing on the same phase-space in which the proposed new principle is hypothetically situated. Hence, the distinction of so-called unique experiment.

10. The same denial of the existence of cognition underlies the work of Bertrand Russell devotees such as Professor Norbert Wiener and John von Neumann on economics and so-called artificial intelligence.

4. e.g., Bertrand Russell and such among his followers as Norbert Wiener of *Cybernetics* fame and John v. Neumann.

5. Nicholas of Cusa, *De docta ignorantia*.

6. Carl Gauss supplied the most devastating proof of Kepler’s method, versus that of Ptolemy, Copernicus, Tycho Brahe, Galileo, Newton, Euler, et al., in adducing the Keplerian orbits of the principal asteroids, as corresponding to Kepler’s prescription for the missing (destroyed) solar planet.

7. Bernhard Riemann, *Über die Hypothesen, welche der Geometrie zu Grunde liegen*, *Bernhard Riemanns Gesammelte Mathematische Werke*, H. Weber, ed. (New York: Dover Publications reprint, 1953), pp. 272-287. On the subject of the relativistic geometry, so to speak, of cognition, my adoption of Riemann’s habilitation dissertation in support of my own discoveries has pointed to the evidence contained within what Riemann’s editor identifies as philosophical fragments, pp. 509-538.

8. Op cit.



*"Cognition, as I have identified it summarily above, is, empirically, the characteristic difference between the human and all other known species." Here, Russian children study the principles of rocketry.*

It is solely through the technologies derived from such cognitive discoveries of experimentally validatable universal physical principle, that mankind's power in and over the universe has been increased to the effect of making possible improvements in the demographic characteristics of populations, as these improvements may be measured *demographically* per capita and per square kilometer of inhabited land-area.

For our purposes here, there are two relevant leading considerations respecting physical science to be considered. First, the validated knowledge of universal physical principles, and of the technologies derived from those principles, is the relationship of the individual person to nature. We depend absolutely upon these means, and no different means, to increase man's power in and over the universe, per capita and per square kilometer. Second, we must take into account the means by which the individual mind's power of effecting valid new discoveries, is cultivated within the individual members of successive generations. The function of Classical methods of education, as contrasted with classroom or related learning of mere "information," typifies the means by which the increase of the cognitive powers of the individual is cultivated.

Riemann's notion of a well-ordered, multiply-connected manifold, as introduced in his habilitation dissertation, suffices to bring the first of those two considerations into focus. The second consideration is a more challenging matter. Compare those two considerations accordingly.

The implicitly crucial argument of Riemann's habilitation

dissertation is, that all validated universal physical principles have come into existence as human knowledge for practice, as such cognitive discoveries of universal physical principles. By the nature of the experimental proofs of such principles, their accumulation is of the form of a universally interconnected set of such principles.<sup>11</sup> Furthermore, the efficient connection among them is determined solely by experimental methods, not aprioristic mathematical assumptions.<sup>12</sup> Typical is the interconnected work of Fresnel, Ampère, Wilhelm Weber, Gauss, and Riemann, leading to both the foundation of electromagnetism and Weber's experimental proof of the Ampère angular-force principle.

At the same time, the development of modern physical science, by demonstrating the principle of least time, in opposition to the formalist's naïve faith in aprioristic notions of shortest linear distance, discredited absolutely those notions of space, time, and matter associated with the work of empiricists such as Galileo, Newton, Euler, et al. The way in which the relativistic notion of Leibnizian least action superseded the simpler notion of least time as such, left no room for the continued toleration of the aprioristic Euclidean

11. In this, Riemann recognized that he was carrying out the intention of his teacher, Carl Gauss. The notion of an anti-Euclidean geometry, of a physically multiply-connected manifold, and that the physically-experimentally determined characteristic curvature of a phase-space is situated in such a multiply-connected manifold, were the foundations upon which Riemann premised his own additional discoveries.

12. Cf. Riemann, *op cit.*, pp. 283-286.



*Aspiring young cosmonauts during the Soviet period. A science-driver policy, of which the space program is a prime example, is the most successful approach to fostering an increase in physical-economic productivity.*

and quasi-Euclidean mind-sets of the empiricists, Kant, et al.

The result of such considerations is, that we must eliminate all aprioristic and kindred formalist notions of a fixed set of definitions, axioms, and postulates from all mathematical physics. In place of such formalist sets, we have an open-ended aggregation of multiply-connected, validated, universal physical principles. Such a fresh conception of a mathematical physics, has the principal significance of enabling us to focus upon the existence of other experimental paradoxes which are most likely to lead us to discover still newer, universal such principles.

That more realistic concept of mathematical physics also serves, for similar reasons, to keep us alerted to the fact that presently adopted mathematical physics leaves out something very important, new principles, which exist in the universe, but which we have either yet to discover, or which, although known, may interact with other known principles in ways we have yet to discover. Such a physics provides us a discipline which tends to alert us to the significance of measurable effects, such as the experimentally demonstrated functions of so-called biophotons, which occur contrary to our presently popular mathematical presumptions.

Once we have taken those considerations into account, we should turn our attention back to the matter of cognition as such. Here, we meet the cross-over point between a relativ-

istic physics as such, and the larger domain of the human mind in general. It is in that latter, larger domain, that we meet the principles underlying the regular phenomena of Classical forms of tragedy.

### 3. The idea of cognition

Cognition, as I have identified it summarily above, is, empirically, the characteristic difference between the human and all other known species. That difference is, in turn, characterized by cognition's role as the source of all those increases in power of our species, in and over the universe, by means of which we are enabled to increase our species' potential relative population-density, as no other species can. Thus, we set cognition apart from, and above the mere learning found among lower forms of life. Animals can learn techniques, but can not discover, and share knowledge of a universal physical principle.

Although the lower forms of *human* intellectual life, such as the mere act of learning, and the related practice of mere deductive logic, do play an inferior, auxiliary, contributing role in a society's increase of its effective potential relative population-density, neither mere learning nor deduction generates those universal principles of practice upon which the qualitative improvement of society's demographic characteristics depends categorically.

It is the changes corresponding, empirically, to the open-ended development of what I shall describe, here below, as a *Riemannian mind-set*, which correlate with the characteristic form of human increases in mankind's power to exist within the universe. It is those changes, in the sense that the notion of *change* is employed in a special way, as by Heracleitus and Plato, which are the characteristic action<sup>13</sup> of the cognitive powers of the individual human mind, the characteristic action expressing the existence of the human species considered as a whole.<sup>14</sup>

The effect is, that when mankind masters a newly discovered, valid universal physical principle, that change in the

13. In Riemann's sense of characteristic of the phase-space of a multiply-connected manifold.

14. Thus, it is not the skeletal remains which distinguish the relics of man from those of higher ape, but rather the artefacts which associate such relics with the characteristics of human cognitive behavior.



underlying mind-set of human knowledge, has the effect of generating willful, human commands imposed upon the universe, which that universe, by its implied design, is obliged to obey.<sup>15</sup> Thus, as Plato's arguments imply, cognition, as I have identified it here above, is synonymous with the strictest use of the term "reason."

However, that notion of reason must not be limited to the subjects of physical science as such. Contrary to Kant, and contrary to the Faustian irrationalism of Romantic Savigny's restatement of Kant's thesis, the assertion of a categorical separation of the cognitive practice of physical science (*Naturwissenschaft*) from art and moral law (*Geisteswissenschaft*), is a hoax against reason itself.

Two broader, phase-spatial implications must be taken into account. First, there is the matter of the individual human mind's cultivation of its innate ability to recognize the act of cognition as a domain of distinct ideas, rather than merely a general type of state of mind, rather than merely a general form of more or less excited creative mood. Second, the possibility of ensuring the progressive, willful development of the human condition in a general way, depends upon recognizing the manner in which the cultivation of the powers of individual cognition, of *reason*, determines both the ability, and the predisposition of society to cooperate in ways which foster both the practice of scientific progress and its application. Hence, *Socratic natural law* is a fruit of *reason*. It is in the latter area of investigations, that we uncover the deeper implications of the Classical art-forms, notably including the composition of great Classical tragedy for the stage.

In the following sections of this report, I shall develop that argument in four successive steps:

First, we shall consider there the difficulties which usually impede the recognition of distinct ideas, among even scientific workers holding terminal degrees today. After that, we shall consider, second, the category of the quality of ideas specific to the leading composers of Classical art-forms, those working in the Classical Greek, as opposed to the Babylonian and pagan Roman (i.e., Romantic) traditions.<sup>16</sup> Then, thirdly,

we shall compare the specific congruences between the admissible principles of composition of Classical art-forms, and the practice of statecraft. Finally, fourthly, I shall situate the social identity of the mortal individual, in the functionally defined expanse of eternity. Take that latter standpoint as the premise for a notion of the mortal individual as an historical existence within a simultaneity of eternity, and then define the study of history, and of competent statecraft accordingly.

However, before turning to those four steps, we prepare the ground for those matters, with the following general observations on the general nature of the problem of ideas being addressed.

We use the term *idea* here, in the only known rational way the term has acquired distinct, scientifically provable meaning: as Plato defined his use of the notion of *ideas* from the standpoint of his Socratic method of dialogue. All such ideas come into human knowledge, as products of demonstrating solutions to certain types of real-life paradoxes, types which can not be solved merely by methods of deduction, which are solved by no other means than what I define as *cognition*. The most important classes of ideas so generated, are those associated with the *successive overturnings* of entire mind-sets, as mind-sets are typified by the classroom set of definitions, axioms, and postulates associated with a secondary course in Euclidean geometry.

For our purposes here, a Euclidean set of definitions, axioms, and postulates, serves us only as our initial working-definition of a mind-set. This is to emphasize, that in such a so-called Euclidean geometry, all statements deemed truthful by such logicians, are derived, as theorems, from the authority attributed to that Euclidean mind-set of definitions, axioms, and postulates. At this point in this report, the simplest, most convenient example of an *idea*, is what is known as a Platonic hypothesis, a physically provable notion which overturns and replaces, or adds to, one or more of the definitions, axioms, and postulates of a widely accepted, pre-existing mind-set.

The most typical such *ideas* are in the same form as the discovery that neither points nor straight lines, neither in space, nor time, nor matter, have any self-evident existence within the physical universe as we experience it. The general form of such ideas of physical science as such, is the ejection of blind faith in the notion of "action at a distance," ejecting such popular, childish notions of matter, as points existing within aprioristic space and time; those errors of blind faith are to be replaced by the experimentally based notion of a non-Euclidean (or, anti-Euclidean) *physical space-time*.<sup>17</sup>

This latter notion is met in Plato's dialogues, and other, pre-Roman, Classical Greek science and art; however, for

15. Such is the empirical evidence in support of *Genesis* 1:26-30.

16. The term Romantic (so capitalized), as counterposed to the use of Classical (so capitalized), is the correlative of the principal conflict within modern and earlier European civilization as a whole. In German, for example, this is the conflict between that Classical tradition of Leibniz and J.S. Bach, around which the collaborators Abraham Kaestner, Gotthold Lessing, and Moses Mendelssohn defined the German Classic, for Eighteenth- and Nineteenth-Century German education, science, and artistic composition. The Nineteenth-Century conflict of Schiller and Heinrich Heine against the Romantics, and of Beethoven, Schubert, Mendelssohn, Schumann, and Brahms against Liszt, Berlioz, Wagner, et al., expresses the meaning of this difference precisely, just as Kant, the Code Napoleon, Hegel, Savigny, et al. express the Romantic, anti-Classical-Greek legacy of pagan Roman law. In politics, the conflict between Classical Greek and Romantic legacies, is an expression of the war between Classical, humanist republicanism (e.g., forms of society premised upon the authority of the general welfare) and the financier- and landed-oligarchical models. A nation ruled in the interest of a permanent

state bureaucracy, is the most common modern expression of the millennial tradition of the Babylonian-Roman oligarchical model. The Code of Diocletian typifies the general characteristics of the oligarchical model to the present day.

17. See the discussion of intervals of action, below.

convenience, we focus, at this moment, upon the emergence of anti-Euclidean physical-space-time geometry, as the latter emerged from the work of those Renaissance figures, such as Cusa, Pacioli, Leonardo, Kepler, and Gilbert, who led in launching modern, experimentally based physical science. The example of the discovery of a universal physical principle of shortest time, to which I have already referred above, is used as the relevant illustration of the point to be made. Using that example, I shall specify, and illustrate, if only in first approximation, the significance of my use of the term *Riemannian mind-set*.

In the case that the indicated method of the Socratic dialectic is used successfully, to supersede a previously adopted mind-set, by a new mind-set more consistent with the principles of experiment, *that transition* from lower to higher order of mind-set, is characteristic of what I define as a first approximation of a *Riemannian mind-set*. In the more general case, that each such change in mind-set is uniquely experimentally valid, relative to each and all of its predecessors, we have a true Riemannian mind-set. This definition applies, in the first instance, to the domain of validatable universal physical principles. However, it also includes a larger domain, the domain of those Classical-artistic and related principles of social behavior, upon which the effective fostering and application of scientific progress depend.

Thus, the more general notion of a Riemannian mind-set corresponds to *the principle of universal change*, as that principle was successively defined by Heracleitus and Plato. Plato's attack upon the sophists and other reductionists, as in his *Parmenides* dialogue, typifies the issue of method pitting Plato's method against that of both his ancient and modern opponents, including the reductionists, as those are typified by the modern empiricists, Kantians, and existentialists generally. The action of universal change associated with the generalized case of the Riemannian mind-set, is otherwise describable as well-ordered individual cognition.

At the beginning, the cognitive powers of the newborn child are as purblind as the infant's visual powers. It is through the use and development of these powers, through the new individual's relations with the world of things and social relations, that the newborn individual improves his or her relevant capacity to make relevant distinctions within the domain of experience.

## How cognition is suppressed

Lest we doubt that just stated judgment of the matter, we might consider the case of ostensibly learned but cognitively "purblind" adolescents and adults, who have yet to develop their innate cognitive potentials in a conscious way. They may experience cognitive moments, but they are not able to develop rationally distinct ideas of those experiences.<sup>18</sup>

18. Cf. Lawrence S. Kubie, *Neurotic Distortion of the Creative Process* (University of Kansas: Lawrence, 1958), and *The Fostering of Creative Sci-*

This rather commonplace failing among even today's putatively educated adult populations, even a growing ration of university graduates with terminal degrees, is not accidental. Consider the case of the economic and social doctrines which the Code of Diocletian decreed for the plebeians and slaves of both Roman imperial and later European feudal forms of oligarchical society.

From the earliest evidence of its debts to the Dravidian-language-group culture of Sumer, the Semitic culture of Mesopotamia, like the pagan Roman Empire derived from it, always typified what the ancient Greeks of Plato's time knew as the oligarchical model.<sup>19</sup> In this model, the subjugated ethnic groups and classes were treated, actually or approximately, as human forms of cattle, with the power to rule over them limited to the oligarchy and its lackeys, and the power to define law as law limited to either an imperial figure or a quasi-theocratic governing bureaucracy, such as the western Roman and Byzantine empires under the rule of a Pontifex Maximus and the bureaucracy associated with imperial rule.

Even today, as in the case of the educational policies proposed by the brutish U.S. Texas Governor George W. Bush, the policy is that the subjects of that tyrant shall be drilled in passing those examinations which will qualify the victims of such education for nothing but the behavior which the oligarchical ruler pre-assigns to the victims of such combined education and employment policies.

It has been only since the modern form of sovereign nation-state republic has subjected the right of government to rule, to evidence of government's adopted mission and efficient performance in promoting the general welfare of present and future generations, that the tendency has developed, toward educating all young future citizens as members of the republic's ruling political body. There is nothing more deadly to the institutions of oligarchical rule, than that the slaves and serfs be freed to acquire the quality of knowledge suited to prospective rulers of the state.

Since cognitive knowledge, such as scientific progress, is a method for revolutionizing the mind-set and related practices of society as a whole, the oligarchical systems have always tended, as if by class instinct, to suppress cognitive fertility in the education and general artistic culture adopted for the use of the subjected strata of the population.<sup>20</sup> Ever

*entific Productivity*, *Daedalus* (Spring 1962). The present author conducted studies of the same problem, respecting the lack of creative insight among some management consultants, during 1956.

19. Cf. Aristotle's trainer, Isocrates of the Athens School of Rhetoric. Compare the policies of the Alexander the Great advised by the Platonic Academy for the destruction of the oligarchical model represented by the Achaemenid (Persian) Empire.

20. The first step toward such an effect may be to reduce the relationship of audiences to exhibitions of Classical culture to the role of spectators, rather than participants in the cognitive process of generating Classical art, e.g., thus reducing the relationship between the general audience and art, to something akin to the role of the Roman proletarians as spectators in the Coliseum.

since the archetypal oligarchical tyrant, which Aeschylus depicted as the Zeus of *Prometheus Bound*, the Prometheans who bring cognitive discovery of knowledge to the generality of humanity, have been the most hated targets of all oligarchical forms of tyranny.

So, the modern Romantics, such as the empiricists, Kant, and the existentialists, have focussed their hatred against Plato and the Classical Greek idea of cognition generally. So, self-styled oligarchical lackey Walter Lippmann conceived the purpose of orchestrating a dictatorship of public opinion, e.g., Roman-style *vox populi* by a financier-oligarchy-controlled mass media, as a weapon against the tendency for reason within the population in general. So, the empiricists, the modern pragmatists, the existentialists, and the Freudians, have exerted their corrupting influences upon primary, secondary, and higher education, and also social policy generally, to the effect of numbing, if not virtually uprooting the cognitive potentials of the citizenry of the U.S.A. in particular.

Typical of such intentionally evil corruption of modern education and related social policy, is the case of the close relationship of existentialist Hannah Arendt to the Nazi philosopher and fellow-existentialist Martin Heidegger. Both, like Karl Jaspers, Jean-Paul Sartre, and Frantz Fanon, were effluent of modern existentialism in general, a movement rooted in the lackey class left in the wake of the decline of the power of the feudal princes of the feudal landed-aristocratic system. Such afterbirth of the 1819 Carlsbad decrees of the Holy Alliance's Clement Prince Metternich, this form of moral degeneracy is known, generically, in Europe, as "the Conservative Revolution."

Zbigniew Brzezinski, like his confederates Josef Korbel and Madeleine Albright, are, like their conservative rivals, such as Adolf Hitler's Nazis, Conservative Revolution scions of the same hate-brimming lackeydom left over from the titled bureaucracy of fallen Central European realms. They were, like Schopenhauer, Burckhardt, and Nietzsche, representatives of a lackey-class moaning over the collapse of the old feudal order of Chancellors von Kaunitz and Metternich. They are in the same genre as such relics of the feudal order known as the Confederacy's "peculiar institution," as the Nashville Agrarians and Confederate flag-wavers of today's U.S.A., with readily recognized affinities toward the later expression of the same Conservative Revolution among the gutter-style, "new conservative" factions within the U.S. Republican and Democratic parties of today.<sup>21</sup>

By instinct, such were followers of the movement of

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Thus, that art is degraded from a cognitive, to a sensory experience, as the degradation of Beethoven's Classical method of composition and performance, by the Romantics Liszt, Berlioz, Wagner, et al., to a Coliseum-like spectator's event of sense-perception. E.g., degrading elements of a Classical musical composition to performance as so-called passage-work.

21. Notably, the Confederacy was the product of the planting of Palmerston's Mazzini organization, under the rubric of Young America, in both Transcendentalist Concord, Massachusetts and Charleston, South Carolina.

"sawdust Caesar" Benito Mussolini. Such were phenomena which the head of the British Foreign Office, Jeremy Bentham, and Bentham's protégé Lord Palmerston, had unleashed upon continental Europe in the form of the Mazzinian insurgencies of Young Europe and Young America. Adolf Hitler, like the self-professed Caesar Napoleon Bonaparte, whom Hitler instinctively admired, was but one variant of this, as were such philosophical cousins of the Nazis as Heidegger crony Arendt, and her other crony Theodor Adorno. Nietzsche's hatred of reason and of the masses of humanity, is mirrored in her avowedly neo-Kantian hatred of reason in particular, and of truthfulness in general, a brimming, foul hatred upon which she based her formal claims to be a philosopher.

The great curse of modern society, is that despite the genuine achievements of European civilization, the intentional and accelerating dumbing-down of the cognitive potentials of the populations of Europe and the Americas, especially during the recent three decades, has created the situation in which those organic intellectual leaders of today's cultures who are morally and intellectually qualified to lead in the republican interest of nations, are relatively isolated by the sea of corruption which social policy, such as policies of manipulated public opinion and education, have accomplished in variously corrupting, or simply numbing the moral and intellectual faculties of the citizenry generally. The fostering of so-called popular, egoistically sensual, e.g., existentialist forms of entertainments, such as the currently popular pornography of both sex and bloody exhibitions of violence, is an integral, functional part of that dumbing-down process, a process of transforming human beings into what Jonathan Swift portrayed as the popular masses of early Eighteenth-Century England, rutting, pleasure-crazed, violence-prone Yahoos.

As a consequence of such dumbed-down states of the general population and leading institutions, the general tendency of current policy, is to lure the dumbed-down popular opinion of nations, and civilization generally, into pathways of self-induced doom. It has been the case, that society has been rescued from such trends only at points of severe crisis, such as the 1929-1931 eruption of the Great Depression of the 1930s, when the trend had become a hopeless one for that society. If suitable leaders had been available, and survived the hatred they draw from the oligarchical factions, as in the memorable case of President Franklin D. Roosevelt, the society was rescued from the doom it had brought upon itself.

However, if those exceptional individuals were eliminated from leadership, as Germany's Kurt von Schleicher was eliminated, through aid of the Anglo-American faction of Montagu Norman and President George Bush's father Prescott Bush, then the doom prevailed, as the elimination of von Schleicher assured Hitler's rise to leadership of Germany, and consolidation of his irrational power ensuring, thus, the great war of 1939-1945. Thus, Germany, during 1933-1934, lost the moral fitness to survive for a decade to come.



*J.S. Bach (left) and Wolfgang Amadeus Mozart. Mozart's intensive study of Bach led to his initial development of a new method of composition, known as motivic thorough-composition. This case shows how the Riemannian mind-set functions within the domain of Classical artistic composition.*

Thus, the most immediate objective of all great statesmen and other suitable leaders of nations, has been to intervene in emerging crises, to lead nations out of the catastrophes which previously prevailing habits of opinion-making have produced. However, the problem would be, at best, only postponed, not cured, until the necessary improvement in the quality of general education and related cultural development of the population as a whole were also accomplished. Shall we allow the recurring decadence, inhering in dumbed-down large sections of populations, to condemn humanity to ever-recurring cycles of doom and resurrection? Can we not rid humanity of such pestilences of hedonism-ridden dumbness? Herein lies the importance of the subject of the Riemannian mind-set. Here, in the cultivation of the cognitive potentials of the individual human mind, lies the only durable future of civilized mankind.

#### **4. Knowing distinct cognitive ideas**

The adult's recognition of a distinctly cognitive play by children comes early, as in the healthy mind of the child in happy constructive, solitary play with blocks. This grows into a later phase, in which the healthy mind of the child expresses itself with the persisting question, "Why?" The cognitive mood is expressed by the child in two realms: why does the universe work as it seems to do; why do people behave they way they do? The significant moment, empirically, is that in which the individual child manifests a visibly elated moment of cognitive insight.

One of the most useful illustrations of the point is the case of the composer Wolfgang Amadeus Mozart, whose earliest written compositions date from the age in which the mentally healthy child is pestering the adults available with what amounts to the question, "Why?" This record makes it possible to trace a process of development in relatively fine clinical detail, through the proliferation of his compositions, up to the time of his death, that, relevantly, during the reign of his mortal enemy, the Chancellor Wenzel von Kaunitz, the controller of the dreaded Austro-Hungarian secret police, the *Geheimpolizei*, of that time.<sup>22</sup>

22. The Austro-Hungarian secret police of that time, was the political-enforcement arm of the princely council, not the Emperor himself. The case of Mozart's patron, the Emperor Joseph II, and, as the case of Schindler underscores this, of *Geheimpolizei* target Ludwig van Beethoven, illustrate the point. The Chancellors von Kaunitz and his successor Metternich, were the agents of that princely council. Contrary to the rumor spread widely against Antonio Salieri, the circumstances of the death of Mozart were purely political, not personal rivalries among composers. Mozart, as well as Beethoven and Schubert, were political allies, and personal friends and collaborators of the extended family of Moses Mendelssohn, and of the circles of that Emperor Joseph II who first instituted Mendelssohn's design for the political liberation of the Jews. The closely associated circles of Kaestner, Gotthold Lessing, and Moses Mendelssohn, were the defenders of the legacy of Leibniz and J.S. Bach against the Romantic Enlightenment of the Eighteenth Century, and the founders of the German Classic of such figures as Friedrich Schiller and his collaborators and followers. The political liberation of the Jews of Austro-Hungary and Germany was an integral, and key feature of the German Classic as a whole. Inevitably, German-speaking anti-Semitism of the Nineteenth and early Twentieth Century, was a project unleashed by that Conservative Revolution which represented the legacy of princes associated with figures such as von Kaunitz and Clement Prince Metternich.

The case of Mozart as child and youth is better understood by comparing Mozart's compositions of the middle to late 1770s with those from about 1782 on. The lessons to be adduced from that array of the evidence, are a relatively most efficient way of presenting a general notion of the method by which cognition generates distinct ideas, as distinct ideas are to be distinguished from a naively excited mood of creative cognitive ferment.

Already, like Joseph Haydn, Mozart's early education in methods of Classical composition was strongly influenced by the work and celebrity of J.S. Bach's most influential son, C.P.E. Bach. This set both Haydn and Mozart apart from the cognitively sterile popularized influences of that time, such as Rameau and Fuchs.<sup>23</sup> It was Mozart's intensive study of the work of J.S. Bach, at the residence of Gottfried van Swieten, which led to Mozart's initial development of a new method of composition, known as *motivic thorough-composition*.<sup>24</sup> Throughout the history of Classical composition, through the final work of Johannes Brahms, the specific discovery represented in Mozart's 1785 piano Fantasy, has been, among leading composers, the most quoted marker of that method of motivic thorough-composition, which original discoverer Mozart derived from his studies of the work of J.S. Bach. That case opens a very special door among those openings to empirical demonstrations of the way in which the Riemannian mind-set functions within the domain of both plastic and non-plastic forms of Classical artistic composition.

The specific Bach work which was pivotal for Mozart's discovery, was Bach's *A Musical Offering*, a work nominally dedicated to the Prussian military genius and flautist Frederick the Great. The central feature of that set of Bach compositions, is the solution for a most stubborn ontological paradox of polyphonic composition. Bach's solution, upon which the entire *Musical Offering* is premised, is his implicit use of an ancient mode, the so-called "Lydian interval."

This work by Bach contains all of the inherent features of an original, validated discovery of a universal principle, comparable to the validated discovery of a universal physical principle. Mozart recognized the implications of Bach's discovery, a recognition which permeates Mozart's six "Haydn" quartets; but, also in his celebrated Köchel 475 Fantasy, Mozart makes the role of the Lydian interval explicit in the most compact and efficient way; the result of that seemingly simple action was a revolution in composition of music, including a revolutionary new way, beginning with Mozart's *Das Veil-*

*chen*, of setting poetry to music. Explicit and other echoes of Mozart's explicit use of the Lydian interval of polyphonic development, as expressed in the K. 475 Fantasy, are a marker which permeates much of the composition of Beethoven, Schubert, Brahms, et al. thereafter. That marker, and the inability of the Romantic composer Franz Liszt to handle that musical subject, as contrasted with Bach-Beethoven-rooted Classicist Frederic Chopin, typifies the role of the model from K. 475 as the keystone of the conception of Classical motivic thorough-composition to the present day.

The importance of the Lydian interval for music was clearly recognized by the enemies of reason, who banned its employment for centuries, libelling it as "the Devil's interval." During Europe's Sixteenth and Seventeenth Centuries, the awful rampage of religious warfare prevented anyone, including, usually, Bach himself, from explicitly stating what he otherwise often employed as the general principle of composition focussed upon the Lydian interval. The Conservative faction of landed aristocracy enforced that ban on the Lydian interval with the same oligarchical zeal applied more broadly to the same purpose, that of enforcing the policy of the Roman Emperor Diocletian's Code, the policy of dumbing-down the human cattle.

To situate the point to be made here, the following summary elements of background must be supplied.

This development, first within the work of J.S. Bach, and then Mozart's reading of certain crucial discoveries by Bach, rested upon preceding developments, especially those changes in music which had been set into motion by the Fifteenth-Century, Italy-centered Renaissance. The leading keys were, first, the development of what became known as *Florentine bel canto* methods of training and use of the singing voice, and second, Leonardo's work on music, which studied the characteristics of the singing voice properly developed, as in the Florentine *bel canto* mode. These contributions led to the rigorous definition of six types of natural human speaking-singing voices, each specifically associated with well-defined registral and related characteristics.<sup>25</sup>

This work of the Fifteenth and early Sixteenth Centuries became entangled with a war among the mutually contending Renaissance, Conservative, and neo-Ockhamite<sup>26</sup> factions of the Sixteenth and early Seventeenth Centuries' period of reli-

23. Jean Philippe Rameau, who composed music as modern Hamburg produces segments of curry sausage, and Johann J. Fuchs, *Gradus ad Parnasum* (1725).

24. Bernhard Paumgartner, in his *Mozart: Leben und Werk* (Munich: Piper, 1969), and Norbert Brainin, who identifies Haydn's notion as *Motivführung*, have traced the origin of motivic thorough-composition to Haydn's *Russian Quartets* of 1781. However, the use of motivic thorough-composition for complete works originates with such Mozart works as his six Haydn Quartets of 1783-1785 and his 1785 Fantasy for piano.

25. *A Manual on the Rudiments of Tuning and Registration, Book I*, John Sigerson and Kathy Wolfe, eds. (Washington, D.C.: Schiller Institute, 1992).

26. The Sixteenth and Seventeenth Centuries' revival of the radically irrationalist school of William of Ockham, was led by the Paolo Sarpi, who was the most powerful figure of Venice from his factional triumph of 1582, until his death in 1623. Sarpi, in addition to being the controlling force behind the rise of power of Francis Bacon in England, was the founder of the neo-Ockhamite doctrine known today as empiricism. Galileo Galilei, a hoaxster who was the personal household lackey of Sarpi, and directed by Sarpi in setting forth the dogma of action at a distance, was also the mathematics teacher of Francis Bacon's intimate Thomas Hobbes, and thus the founder of all varieties of empiricism and its positivist and behaviorist outgrowths today.

gious warfare. The two leading geniuses who emerged, as outstanding in the reawakening of the Renaissance tradition after the 1648 Treaty of Westphalia, were Gottfried Leibniz and Johann Sebastian Bach. These latter two figures, situated historically as their followers Kaestner, Lessing, and Mendelssohn situated them, supplied the keystones for the mid-to late-Eighteenth-Century emergence of the German Classic and of modern Classical poetry and music, and also for the further development of Leibnizian science, by Carl Gauss, Bernhard Riemann, et al.

To appreciate the significance of J.S. Bach's discoveries, and the impact these discoveries had on Mozart et al., Bach must be situated as I have just done here. The significance of the Lydian interval becomes apparent in that historical context.

There is nothing devilish, or otherwise magical in the Lydian interval as such. Empirically, it arises most commonly, in its primitive form, as a natural registral shift, as, for example, the passing on F# by tenors and sopranos in the passage from the first to second register in the soprano voice, or, from the second to third register in the tenor voice. Thus, in a well-tempered tuning, the interval defines a dissonance of special, but natural significance for the singing of the scale and also for the speaking voice, as in Classical

poetry.<sup>27</sup> Other polyphonic forms of the Lydian interval have the same significance.<sup>28</sup>

In Bach's Well-Tempered System of polyphony, that and other occurrences of the same interval appear as musical paradoxes. In Well-Tempered composition, such dissonances appear naturally from the polyphony itself.<sup>29</sup> The task of the composer is to eliminate the *discordant implications of the dissonance* as such, by resolving it through the only means possible, the *polyphonic* development of the composition as a whole, that according to Florentine *bel canto* voice-training and singing principles. A dissonance is no longer a disso-

27. The most obvious root of the usual inability of university-educated modern speakers, including most among today's young professional actors, to deliver Classical European poetry, is the musical illiteracy of their habits of speaking, habits which have been aggravated in the extreme by modern university classrooms, as by the influence of mass-media examples. The lack of discipline in registration and other Classical forms of musical coloration, results in recitations of texts according to some eccentric style, with little or no comprehension of the content of the composition being mauled in that sort of delivery.

28. Beethoven's Op. 132 string quartet demonstrates the general principle.

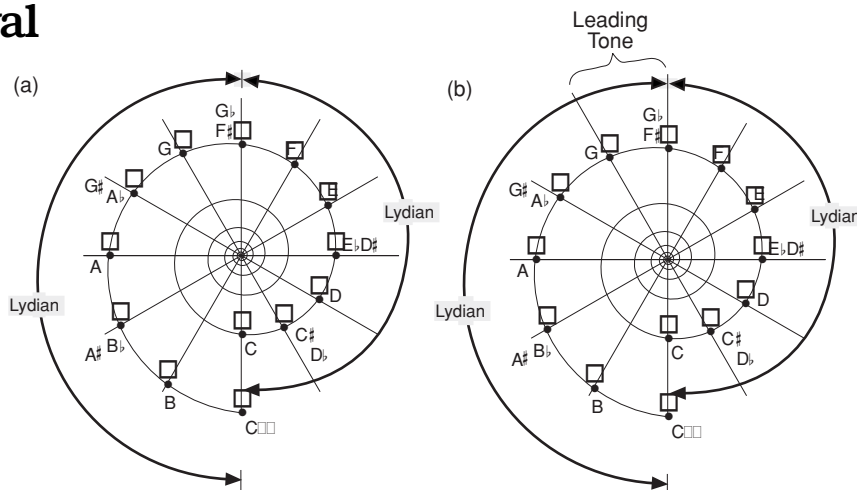
29. As best demonstrated by the exercises in the role of inversions in J.S. Bach's *The Art of The Fugue*. See the result in the so-called late quartets of Beethoven.

## The Lydian interval

From Bruce Director, "What Mathematics Can Learn from Classical Music," *Fidelio*, Winter 1994.

A singularity of great importance, the "Lydian" interval is the interval which divides the octave exactly in half. It is often misnamed the "devil's" interval, or tritone. From the standpoint of the diatonic scale in itself, it is also popularly described as an augmented fourth or diminished fifth.

The Lydian is the only interval which cannot be generated by the principle of inversion or complementary intervals within any given mode. This interval uniquely divides the octave exactly in half: that is, the interval from the tonic to the Lydian tone is the same amount of change as the interval from the Lydian tone to the octave. In the mode of C major/minor, for example, this corresponds to the interval between C and F#, which also corresponds to the



physical singularity of the register breaks in the soprano and tenor singing voice [figure (a)].

In the major/minor mode, the Lydian interval is a dissonance with respect with any given mode. For example, in the mode of C major/minor, the interval C-F# is such a dissonance. Yet, this Lydian interval has the unique property of being a pathway from one mode to the next, by way of the leading tone of that next mode (F#-G in the mode of G major/G minor) [figure(b)].

nance, if it is efficiently situated as a change which brings the music from a relatively more primitive state of fixed tonalities, to a higher, Riemannian-like form of development. This is key to Furtwängler's "performing between the notes." This is, of course, in direct opposition to Romantics and modernists, who substitute arbitrary sensual and other effects, for a principle of lawful, implicitly Riemannian development of the composition as a manifold. What is necessary to bring into being a higher purpose, in the service of reason, is never dissonant.<sup>30</sup>

Such is the nature of metaphor in Classical poetic composition. *Metaphor* signifies those ironies which serve as paradoxes beyond the tolerable reach of either deduction, or of that familiar prostitute known as symbolism. If the metaphor deployed by the poet corresponds to a real condition in nature or social relations, or in cognition as such, it is, therefore, a true ontological paradox, comparable thus to those paradoxes which prompt the discovery of validatable universal physical principles. There is a moral principle which regulates all honorable use of metaphor. The principle of Classical metaphor, is, that, like an ontological paradox in science, the paradox portrayed must correspond to a condition in the real world, a contradiction in belief which the previously conventional use of words by the hearer had not yet learned to grasp in a consistent way.

The result of letting such paradoxes develop naturally, and resolving them, defines the process of musical composition as a developmental process in the same sense implied by a Riemannian mind-set. The resolution of such a paradox, or series of paradoxes in that way, transforms a mere dissonance into a pivotal feature of a true Classical metaphor. Thus, the resolved metaphor becomes the subject, the unifying identity of the poem as a whole, just as the corresponding, central developmental feature of a piece of Classical motivic thorough-composition, is the subject: the idea of that composition

as an indivisibly coherent whole.<sup>31</sup>

Such paradoxes are but one among the types of ironies by means of which metaphors are generated, and resolved, in Classical motivic thorough-composition. This principle of making development itself the subject of the entire composition,<sup>32</sup> is what defines Classical composition of the Bach family, Haydn, and Mozart, as actual art, in contrast to the monotonous silliness of Rameau and shallow pedantry of Fuchs. On this account, there is a germ of power in the work of Bach like no other, and, thus, the development of Classical motivic thorough-composition, by Mozart et al., on the basis provided by Bach, is the most powerful form of musical composition known. Hence, Gotthold Lessing and Moses Mendelssohn avowed their common purpose to be to defend the legacy of Leibniz and Bach against the "Enlightenment" salons deployed throughout Europe on the initiative of Abbot Antonio Conti.

Once again, the musical issue is the same frequently addressed by the conductor Wilhelm Furtwängler, the issue sometimes referred to by him as "performing between the notes." I have often restated the same point by emphasizing that the performer must sing the music, not the mere notes as such. The notes chosen and assigned by the composer have authority, but the essence of their authority lies, like the natural occurrence of a Lydian interval, in the transitions which the notes, taken as a polyphonic entirety, demand, rather than in some superimposed, stylized interpretation of the mere notes, or local interval as such. Above all, one must play the paradoxical polyphonic transitions, the changes, using "change" with the same connotations supplied to the term, successively, by Heracleitus and Plato. This is true not only for Classical poetry and music; it is true for physical science.

Music, by its nature, is the immediate expression of passion. It is that passion which drives the ordering of tones, and the tempo, too, both from one tone to the next, and in determined relationship to the unfolding of the other polyphonic voices.

Two choices of passion are available: sensual (e.g., erotic, profane) or cognitive (e.g., agapic, therefore sacred).<sup>33</sup> Romantic music is predominantly erotic, best suited to the salons of sundry varieties of plain and fancy houses of prostitution. All accomplished expression of Classical musical composition, like all Classical art, is predominantly agapic. The emotion associated with the discovery of a validatable universal principle, for example, is typical of the agapic passion, the passion of "tears of joy." The function of all Classical art is to create thought-objects whose developmental features not merely evoke the quality of passion associated with cognitive,

30. In Classical composition, and in its performance, there is no dissonance as such. Rather, there are transitions integral to a process of ongoing development. For such purposes, the formal dissonance must be performed as precisely such a transition, by emphasizing both the harmonic and metrical transitions themselves as the defining, developmental actions within the composition as an integral entirety. This is the action which lies "between the notes," which must never be used as arbitrary dissonance, as in Romantic chromaticism, as in so-called "passage work." Thus, in Classical performance, the way in which the conductor or performing artist attacks the composition, as from a moment before the start, is decisive in putting across the composer's intent. I, for one, first recognized this as a distinct and lawful principle, during early 1946, in a U.S. Army replacement depot outside Calcutta, India, at first hearing of Furtwängler's conducting of a Tchaikovsky symphony, in an HMV recording. The same principle is characteristic of the required performance of all works in a strophic form, in Classical poetry or music: there must be a progressive variation in enunciation among the strophes, a variation which, taken over the breath of the composition, from beginning to close, is metaphorical in character, which prompts the performance to move the audience's mind in the way corresponding to the intended metaphor which the composer has defined by the closing of the composition as an integrated whole.

31. This is key to understanding the musical-revolutionary character of Mozart's *Das Veilchen*, for example.

32. Rather than some silly symbolism.

33. I.e., *agapē*, as used by Plato, and as defined by the Apostle Paul's *I Corinthians* 13.

i.e., agapic, activity, but to provide an object, art, which enables the artist and audience to share the cognitive experience associated with Classical forms of composition.<sup>34</sup> That sharing of such experiences typifies what is rightly praised as *beauty of ideas*. These objects, so shared, provide a means not only for sharing such an agapic experience; they are part of rendering the cognitive experience as a domain of shared experience, and thus a domain of increasingly clearly distinct ideas.

The persistence of Mozart's K. 475 Fantasy, and of inversions derived from it, throughout the sweep of the Classical repertoire, from Mozart through Brahms, provides illustration of the meaning of the term "distinct cognitive ideas." [Figure 1]

The K. 475 defines a specific sort of cognitive paradox, adduced from Bach, and also its immediate resolution. This has a root and significance for musical composition and performance as a whole: i.e., the kind of universality associated with the notion of universal principle. The enunciation of the F# in the opening statement of that composition, becomes, thus, a pivot on which the possibility of success by the performer exists, or not. This feature of the K. 475 already has, thus, the quality of a distinct and universal compositional idea. Mozart's own *Ave Verum Corpus*, one of his several last compositions, is a powerful and compact expression of that. When any other composer, as Beethoven repeatedly developed this germ-idea in ever richer ways, revives this Mozart discovery, that too becomes a distinct cognitive idea in its own right, distinct from the original Bach and Mozart, but, with other related compositions multiply connected with it, on principle. The nature of this generality is itself made a clear and distinct cognitive idea, if one looks at the relevant aspects

FIGURE 1

## Opening of Mozart Fantasy for Piano, K. 475

Adagio

The musical score for the opening of Mozart's Fantasy for Piano, K. 475, is presented in a piano arrangement. The tempo is marked 'Adagio'. The key signature is one sharp (F#), and the time signature is 3/4. The score consists of 17 measures. The dynamics are marked as follows: measures 1-4 are marked *f* and *p*; measures 5-8 are marked *f* and *p*; measures 9-12 are marked *f* and *p*; measures 13-16 are marked *f* and *p*; and measure 17 is marked *f*. The score is written for piano and includes measure numbers 5, 8, 11, 13, 15, and 17.

34. *Thought-object* signifies a cognitive conception, as distinct from a mere sense-experience as such, as the object of thought. All true ideas, especially universal physical and Classical-artistic principles, are such thought-objects.



of Bach's development of his own compositional methods, including his *Musical Offering*, from the retrospective standpoint provided by Bach's treatment of the subject of inversions in his *The Art of the Fugue*.

The broader relevance of this aspect of Classical composition is to be seen, when one recognizes that the qualities of distinct ideas found in the experiencing of Bach and his successors in motivic thorough-composition, are also the qualities of passions associated with original and replicated original discoveries of universal physical principles.

This brings us back to the lesson to be extracted here from the matter of an experimentally demonstrated principle of least time.

## How time discredited Euclid

To summarize the background for the next point I have to make at this phase:

In contrast to what often passes for textbook knowledge in many relevant locations, still today, consider the fact, that empirical evidence shows, that the concept of the shortest time, rather than shortest linear distance between two points, governs the pathway of refraction of light. This is only one of those most critical physical discoveries which destroy the authority of the reductionist and other ivory-tower varieties of mathematical dogma; but, it is among the most useful in the classroom, like certain discoveries in number-theory, as by Pierre de Fermat, Carl Gauss, Lejeune Dirichlet, and Riemann, for example, also the most deceptively elementary (but, not simple) one.

In standard sources, this discovery of a universal physical principle of least time is justly attributed to Fermat.<sup>35</sup> After Fermat's contribution, the next decisive step toward understanding a principle of universal shortest-time, instead of shortest-distance, for light, was taken by Christiaan Huyghens' implicit defense of Kepler, in opposition to Galileo Galilei's doctrine of "action at a distance" for gravity. That defense was first demonstrated in the most dramatic way, in

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35. However, we should also note, that there is the earlier germ of this same discovery in Leonardo da Vinci's work on light, vision, and retarded propagation of both sound and light in transverse-wave modes. Leonardo's experimental demonstration of the functional relation of catenary and caustic, implicitly anticipates the later principles of regular non-constant curvature as developed by Kepler, Fermat, Huyghens, Leibniz, et al. Admittedly, it is the conventional view, that sound waves are not propagated as transverse waves; however, that view, according to Riemann's famous work defining the existence of transsonic shock-fronts (*Über die Fortpflanzung ebener Luftwellen von endlicher Schwingungsweite*, *Werke*, pp.157-175), mistakes an effect produced by sound propagation, for the process which generates that effect. Notably, Riemann's paper is key to many specific topics in physics, including isentropic compression in thermonuclear fusion. Note an interesting series of studies by the Polish physicist S. Kaliski, published in English: *Rendering Explosion Compression Isentropic by Means of an Outer Layer of Comparable Susceptibility*, in *Journal of Technical Physics*, 17, 4, 349-358, 1976.

Huyghens' *The Pendulum Clock* (1673),<sup>36</sup> and, later, also for light, in Jean Bernoulli's celebrated 1697 demonstration of certain implications of Huyghen's *Treatise on Light* (1678).

At this point, the reader should be cautioned, that the subject of this report is the relevance of the notion of a Riemannian mind-set for statecraft in general. We are illustrating the point that the principles of a science of statecraft, are rooted in the same cognitive processes and principles which underlie the progress of physical science. Thus, in this location, our argument respecting matters of physical science, is limited to meeting certain pedagogical requirements relevant to showing that specific connection. That cautionary observation made, we resume the account on the matter of least time.

In Leibniz's *Acta Eruditorum* of 1697, Jean Bernoulli, following the work of Fermat, Huyghens, O. Roemer, and Leibniz, constructed the famous demonstration of a cycloid pathway of changes in rate of refraction of light. While sophists sometimes present this as a matter of formal mathematics, the fact is that the crucial premise of the mathematical part of Bernoulli's presentation, is his experimental demonstration of a *physical* principle, a demonstration then supplied a mathematical description.<sup>37</sup> During the early Nineteenth Century, A.-J. Fresnel's and François Arago's obliteration of Isaac Newton's, C. Coulomb's, and S. Poisson's views on action propagated along a linear distance, respecting light, was complemented by the related work of Fresnel's collaborator A.-M. Ampère, in founding the principles of electromagnetism. In the case of Fresnel, it was the physical demonstration of Fresnel's experimental proof of a universal physical principle, as demonstrated by Arago, which is crucial.<sup>38</sup>

Similarly, the principle of the Ampère angular force was proven experimentally, in joint work by Gauss, Riemann, and Wilhelm Weber, with the concluding physical-experimental measurements supplied by Weber.<sup>39</sup> During the middle decades of the same century, the work of Wilhelm Weber and Carl Gauss, on electromagnetism, proving and measuring the characteristic of the angular force of Ampère, provided sufficient proof to settle the key issues for science as such. The result of these lines of physical experiment, as I have stated here earlier, was the Gauss-Riemann notion of so-called multiply-connected manifolds.

Despite the physical evidence, the experimentally discredited, empiricist standpoint of Sarpi, Galileo, Hobbes,

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36. Richard J. Blackwell, trans. (Ames: Iowa State University Press, 1986).

37. Cf. Riemann, op. cit., pp. 283-286.

38. See proceedings of 1999 Schiller Institute Summer School, on this topic, at Oberwesel, Germany.

39. This specific connection was first brought to the attention of the present writer by Chicago University physical chemist Professor Robert Moon, at a meeting with the present writer and others, at the writer's residence, in 1974. Professor Moon presented the work of Ampère and Weber, in support of the writer's argument against the absurdity of blindly applying the so-called law of Coulomb to the microphysical domain.

Locke, and Newton, has persisted as orthodox classroom dogma in most of the world's classrooms, to the present day. In the guise of the anti-Leibniz, anti-Bach Eighteenth-Century "Enlightenment," the empiricist's efforts to impose the ivory-tower standpoint of the formalist's Euclidean mindset, was continued by not only such obvious scoundrels as Voltaire and Maupertuis, but also the entirety of the pro-Newton, formalist school of such followers of that Paris-based Venetian Mephistopheles, Abbot Antonio Conti, as Leonhard Euler, J. Lambert, J.-L. Lagrange, Immanuel Kant, Augustin Cauchy, et al.<sup>40</sup> In the extreme cases, this formalist tradition includes such Twentieth-Century notables as the hateful Bertrand Russell and his acolytes, the Göttingen expellees Norbert Wiener and John von Neumann.<sup>41</sup> The logical-positivist hoaxes known as "information theory," "systems analysis," and "artificial intelligence," express the extremes to which Russell and his followers have carried the empiricist version of the ivory-tower tradition.<sup>42</sup>

In furtherance of the facet of the argument to be supplied at this point, it is sufficient to concentrate attention on the implications of Huyghens' work on the subject of the Pendulum Clock. [Figure 2] Focus on the celebrated experimental demonstration, that a ball descending along the pathway of a cycloid, reaches a point quicker along that pathway, than a virtually identical ball rolling to the same point along a shorter, straight-line pathway.<sup>43</sup> Compare this with Fermat's view of refracted light travelling at a net distance determined by the shortest time, rather than the shortest distance. Compare that with the related empirical considerations which Leibniz and Bernouilli adduced from the point of reference supplied by Huyghens' *Treatise on Light*.

Already, Fermat's observation had done much more than

40. Conti, who died in 1749, was the most notable successor of empiricist Paolo Sarpi, in spreading the neo-Ockhamite, empiricist and related dogmas throughout early Eighteenth-Century Europe. Conti was, in fact, the father of what is known as the Eighteenth-Century Enlightenment, and also the principal creator of the mythos of Isaac Newton. He organized a Europe-wide network of salons, which included the figure Voltaire, with Newton's controller, Dr. Samuel Clarke, and such enemies of Leibniz, Bach, Lessing, and Moses Mendelssohn, as the Berlin circles of Maupertuis, Francesco Algarotti (*Newton for Ladies*, 1837), Euler, Lambert, and Lagrange.

41. Wiener for incompetence in scientific work, by David Hilbert himself, and von Neumann under darker charges by Richard Courant. It is typical of Russell, that he was in fact, the father of the militarily unnecessary nuclear bombing of helpless Japan civilians at Hiroshima and Nagasaki, and the author of the doctrine of preventive nuclear warfare.

42. As noted here earlier, the mathematical form in which the ivory-tower view is expressed, is the assumption asserted by Euler's childish attack on Leibniz (*Letters to a German Princess*: 1761), that connections in the universe are axiomatically linear in the infinitesimally small. That is the elementary absurdity of pure formalism, upon which the dogmas of "information theory," "systems analysis," and "artificial intelligence" are premised, axiomatically.

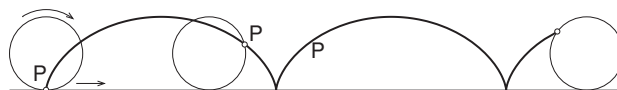
43. This is, admittedly, only the relatively simplest implication of the experimental demonstration, but it suffices for our immediate purposes here.

FIGURE 2

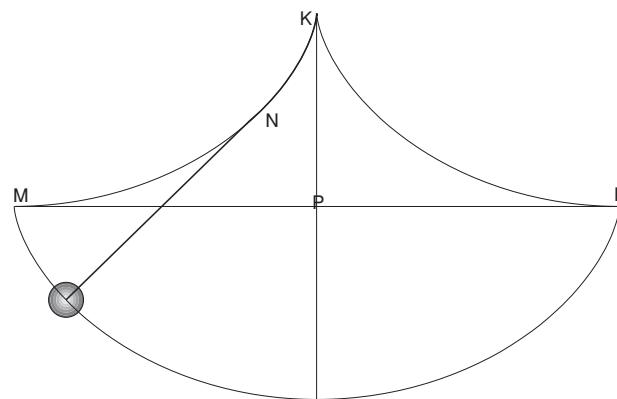
## The cycloid and the pendulum clock



(a) 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.



(b) The cycloid is the curve traced out by a point on a circle, as the circle rolls along a line.



(c) Huyghens used the cycloid to make a pendulum clock, because no matter how wide the swing, the time of the swing remains constant.

to challenge the assumption that the physical universe was organized as Euclidean geometry implied. The issue was not that of modifying, or not modifying one or more of the postulates of Euclidean geometry. As posed implicitly or explicitly by Leibniz, Kaestner, Monge, Gauss, and others, the issue was, whether or not to scrap the Euclidean axiomatic mindset in its entirety. Hence, the significance of distinguishing anti-Euclidean geometries from the sundry so-called, merely non-Euclidean ones.

Taking the whole sweep of related discoveries, over the period from Nicholas of Cusa's *De docta ignorantia*, through the work on principles of physical science of Leonardo da Vinci, through Kepler and Gilbert, and through the work of the circles of Lazare Carnot and Gauss, Fermat's observation must be read as, implicitly, a subsequently validated disproof of the most fundamental, axiomatic assumptions underlying all of that modern reductionist mind-set, the which is still popular in most of the science and mathematics classrooms of secondary schools and universities, even today.

Although the referenced work of Fermat, Huyghens, Leibniz, Bernouilli, Fresnel, et al., are matters addressed in standard instruction today, it must be emphasized that the usual practice is to emphasize the mathematical plausibility of the constructions, while ignoring the fact that in these so-called crucial cases, good mathematics was always, chiefly, the child of experimental physics.<sup>44</sup> Thus, it is by the ivory-tower sophist's stubborn fallacy of composition, in ignoring the higher scientific authority of physics, that these formalist, otherwise described as so-called ivory-tower cliques, defend the honor of their *Laputa*-like, floating islands of reflection, still today.<sup>45</sup>

Looking at the most elementary features of the modern history of that latter, reductionist mind-set, provides us an insight into the way in which such kinds of tenaciously held, fallible, even official beliefs induce entire nations and cultures either to destroy themselves, or to come close to doing so. This is not only the presently crucial problem of today's Russia, but also the immediate problem of many nations, including all of continental Europe and, especially at the present moment, the United States itself.

The crux of that present life-or-death issue of scientific method, so posed, recurs as an age-old problem. That problem is the popular, naive assumption, that sense-phenomena, as such, are in simple correspondence with what uncritical minds esteem as the self-evidently axiomatic principles deemed common to the phenomena of vision, hearing, touch and feeling, taste, and smell: as these senses are associated with the notions of pleasurable and painful forms of such sensations. The principal correlative of such popular delusions, is the notion, that the physical objects which are adduced as the subjects of sense-perception, are floating in an infinite mental soup, of three linear, aprioristic dimensions of space, plus one of time.

By limiting knowledge to a deductive interpretation of the evidence of sense-certainty, the modern reductionist and mystics alike, limit the investigation of the physical universe to the attributed primary authority of the senses as such, and thus, by means of that exaggeration, exclude conscious consideration of the only human faculty, cognition, by means of

which actual knowledge of the principles governing observed events, both physical events, and also social-political events, may be obtained. This is the only faculty by means of which the planet's human population has lifted itself above the conditions of life and relative population potential, of several millions, of higher apes. Anything which cannot be explained away within those terms, is popularly relegated by such self-designated Hobbesian monkeys to the domain of mystical speculations, speculations which might be as wild as one wished, and which often are just that.

Thus, by direction, or by default, sense-certainty is the mother of all foolish, even often fatal superstitions. To emphasize the corollary argument just referenced, above, blind faith in sense-certainty dehumanizes the believer, by denying and avoiding those functions of cognition which set the human individual apart from and above all the lower species. The corollary of such faith in sense-certainty, is the victim's susceptibility to the worst sorts of superstition, such as belief in witchcraft, addiction to gambling, religious adoration of the supposed miracles of "free trade," and so forth.

Hence the empiricist doctrine of nasty Paolo Sarpi's household lackey and "Boswell," Galileo. Hence, the celebrated concoctions of Isaac Newton, now largely discredited, long since, by the known physical evidence.

Thus, we have three, interdependent, leading fallacies common to the attempt to situate physical experience within the kind of mind-set associated with the reductionists. The first fallacy, is the false, but popular assumption, that sense-perception provides us a functionally truthful representation of the physical world in which we exist. The second, derived fallacy, is the notion of the existence of empty space, or, in the alternative, an imaginary substance sometimes referred to as an "ether," as filling up the perceived or imagined space, and also time, between the points which sense-perception locates as observed events. The third fallacy, is the assumption that motion in what is presumed to be either empty, or ether-filled space-time, that ordered according to fixed laws of action-at-a-distance, is the real form of elementary action in physical space-time.

Thus, the notion that action in physical space-time corresponds to a universal *physical* principle of least time, implicitly shatters the reductionist mind-set, and all of its principal component definitions and axiomatic presumptions. Confrontation with those paradoxical facts, will either torment the individual into blind, ranting rage, and even possibly madness, or the individual's healthy mental reaction will force the thinking person's attention back to the subject of cognition.

At first inspection, the fact that a *physical principle* of shortest time, rather than shortest distance, determines the natural pathway of action for light, forces us to abandon the notion, that time, and forward-backwards, up-down, and sideways extension in space, are self-evidently, infinitely, simply extensible dimensions of space and time. The initial effect of discovering a principle of least time, is akin to that of

44. Again, Riemann, op. cit., pp. 283-286.

45. Jonathan Swift, *Gulliver's Travels*, Part III: A Voyage to Laputa.

discovering the problem of projecting the approximately spherical surface of the planet onto a plane map: a paradox which most true believers in a flat Earth have found it difficult to accept. Otherwise, the implications of least time are more profound, and thorough-going than the problem of the Mercator projection.

The evidence of a least-time principle, is rooted securely within the bounds of the legitimate functions of sense-perception themselves, as is the case for the related evidence which prompted Kepler's similar definition of Solar orbits, and his related, original discovery, and proof, of a principle of universal gravitation.<sup>46</sup> To this we must add the evidence, especially from Kepler and his followers, that the functional connection among the dots of sense-perception is not only not linear, but involves regularity of non-constant physical-space-time curvatures. This problem, first defined for astrophysics by Kepler, became the central focus of Leibniz's discovery of the calculus, and the central feature of the development of the general notions of multiply-connected manifolds by, most notably, Gauss and Riemann. So, cognitive reflection upon the need to situate a least-time principle within physical space-time so defined, points toward the conclusion, that the natural pathways of physical action in space-time could not be those deduced from ivory-tower, linear assumptions.

Once this is taken into account, we must reject such childish presumptions as blind faith in the notion, that sense-perception as such is a simple mirror of the way in which action is generated in the physical world. Rather, it is the provable absurdities inhering in a naive view of the domain of sense-perception, which impel the mind of an honest person to focus more attention *Socratically* on the paradoxes inhering in sense-certainty, than upon the relatively coincidental, apparent consistencies.

The discovery of a principle of least time is typical of those paradoxical facts which free the clear thinker from blind faith in sense-certainty. With that discovery, the connections linking one perceptible event to a successor, are now located in knowledge of those validated, discovered, universal physical, cognitive principles which the paradoxes of experience have impelled us to generate within our sovereign cognitive processes. Thus, appreciating the fact that sense-certainty is intrinsically paradoxical, we seek certainty in the real world beyond sense-certainty, in the experimentally validatable universal principles generated by cognition, not deduction. These principles, discovered by cognition, rather than Augustin Cauchy's sophistical, linear "limit theorem" for the calculus, define the non-linear action which actually defines the way the *Riemannian physical-space-time curvatures* in which the "dots" of sense-perception are actually to be connected to one another.

We abandon childish faith in the objects of sense-cer-

tainty, and seek, instead, the provably knowable, efficient identity of the unseen, real universe which moves those objects. Cognition is the only human faculty by means of which the mind can see that reality, a reality expressed as experimentally validatable universal principles. Once that faculty is recognized, it, the faculty of cognition, now supersedes the superstitious man's blind faith in the mere senses. Truth is seen, with the inner eye, and heard with the inner ear, by the faculties of observation which lie within the domain of Platonic forms of cognition.<sup>47</sup>

It is from those paradoxes presented to us by sense-perception, such as the physical-experimental paradox of shortest time, or Leonardo's demonstration of the relationship, for light, of catenary and caustic, or Kepler's original discovery of universal gravitation,<sup>48</sup> that mind is impelled to discover, through cognition, those universal physical principles which disclose the actual modes and forms of physical action which connect the sense-perceptual dots of experience. Instead of attempting to adduce the laws of motion of perceived objects from the assumption that the space-time soup in which such perceptions swim, is self-evidently Euclidean, we must adduce the nature of the soup of physical space-time from those validatable experimental, universal principles which dissolve the paradoxes of pre-existing prejudices. We pass thus, from Euclidean geometry, to the anti-Euclidean geometry which Gauss and Riemann reference by the name of multiply-connected manifolds.

The case of shortest time serves, in the history of modern science, as a typification, a marker, and an included central feature of the passing-over of the mind-set of the scientist from those domains of superstition known as magic and reductionism, into true experimental science. Thus, we are led from the delusory domain of perception, into the world of reason, of cognition, of distinct cognitive ideas.

The faculty employed to this effect, is the same which conductor Wilhelm Furtwängler defined for music, as "performing between the notes." "Connecting the dots" in a linear way corresponding to Cauchy's calculus, whether in music or physical science, makes for dead music and sterile science. In the extreme, it produces those marketable dead souls of "free trade," which populate the ranks of the devotees of such charlatans as "information theory's" Norbert Wiener and "systems analysis's" John von Neumann. So, it is only among the living dead of the ranks of music critics, that the compositions of the Romantic Rameau are defended as "entertaining."

We are impelled, thus, to replace blind faith in sense-perception, by reliance upon experimentally demonstrable, discovered universal physical principles. By the very way in which we define those experimental paradoxes which prompt

47. I.e., the Socratic method characteristic of Plato's dialogues, as opposed to the deductive/reductionist methods of Aristotle.

48. Johannes Kepler, *The New Astronomy*, passim.

46. As proven conclusively by Gauss for the case of the asteroid orbits.

us to make further discoveries of universal physical principle, we are forced to situate validated, discovered such principles with respect to one another. We situate these, one with respect to the other, according to the way our minds replicate the generation of each discovery with respect to the experience of the generation of the same discovery (and its validation) by the others. So, instead of ideas of principle, each floating independently in free space, we know these principles in terms of their efficient multiply-connected relationship of interaction, one with the others. That interconnectedness becomes the idea of space-time as a Riemannian manifold defines physical space-time.

This view of a principle of physical space-time led Leibniz to recognize that such a notion of least time was but a reflection of a deeper, more general principle, a principle consistent with the notion of characteristic, regular, but non-constant physical-space-time curvatures, a principle consistent with departing the formalist's universe of space and time, and entering the real universe of physical space-time; the domain of *universal least action*. It was this, which implicitly destroyed the authority of all Kantian, and other popular notions of *a priori* space and time, which evoked the fiercest expressions of hatred from such disciples of Antonio Conti as the hoaxster Maupertuis, and also Euler and his immediate associates and followers.

This notion of relationship among physical principles, is not separable from the cognitive-emotional (i.e., agapic) experience of their generation, as original or replicated original discoveries, within our mind. This nature of the cognitive-passionate relationship among definite notions of universal principle, affords to each the quality of a distinct idea. It is the same for science as for Classical art.

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## 5. Man and nature: physical economy

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We are thus advised to ask ourselves: How shall we summarize this, in the form of a single conception, for today's political practice? To craft that conception, we must focus upon the relationship between the performance of economy as physical economy, and the political forms of organization of modern society.

This brings us to the matter of those self-styled "ecologists," and others, who classify the human species as merely another ape, and who thus avow, that they find nothing within themselves to distinguish them essentially from just another variety of monkey. Many employ precisely that contemptuous view of human beings, to propose measures which would, in fact, represent the application of Adolf Hitler's methods of selective population-control to present-day populations. The *de facto* genocide which externally demanded economic reforms have imposed upon Russia's population, is a consistent

outgrowth of precisely such oligarchical contempt for chosen classes of human victims.<sup>49</sup>

Should we permit persons who have nothing better to do than to make monkeys, even mass murderers of themselves, to occupy high-ranking political positions, or as teachers of young human beings in our schools, to make laws in our nations, or to impose world-government over the human species? The issue so defined, is the central political issue of all contemporary disputes respecting political systems, social relations otherwise, the nature of science, and even the great questions affecting the choices between escalation toward some form of world-wide warfare, or a turn to durable peace, instead.

The question, whether human cognition, as distinct from the learning activity of the apes, is as efficiently existent as I have argued it to be, is to be answered most simply in the following, summary way. I recapitulate my earlier argument here, this time in the language of physical economy.

First: do discoveries of universal principle unique to cognition, result in increase of the *measurable* power of the human species, within and over the universe? This means a power whose effects can be measured per capita and per square kilometer of the Earth's surface.<sup>50</sup> Hence, this becomes a question for a science of *physical economy*.

Second: if the demographic characteristics of societies have been improved to that effect, we must consider the two arguable types of causes for such benefits: increases attributable to the realization of universal physical principles; and, increases attributable to the benefits of those kinds of improvements in qualities of social cooperation, which are fruits of the realization of discovered Classical-artistic and related universal principles, such as those principles of statecraft which are properly derived from the combined wisdom of Classical science and Classical artistic composition.<sup>51</sup>

Those two sets of questions establish the branch of physical science known as *physical economy*. The measurements required by that branch of science, express a governing principle of *universal least action*, as Leibniz defined least action. The questions are: does the injection of the discovery of new universal principles, physical and Classical-artistic in type, into the practice of society, result in an increase of the rate of growth of man's power in and over nature, as measurable per capita and per square kilometer of surface-area? The roles of

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49. Cf. Sergei Glazyev, *Genocide: Russia and the New World Order*, R.B. Douglas, trans. (Washington, D.C.: Executive Intelligence Review, 1999).

50. Measuring these values in terms of surface-area of the planet Earth, is significant for measuring the impact of space-exploration, and even colonization outside the Earth. That is to emphasize, that it is from Earth that space-exploration is sustained, and to Earth that much of the benefit of that exploration and colonization returns, as, for example, in the impact of relevant scientific progress on the economy of Earth itself.

51. The positive results of phenomena associated with so-called Kondratiev Waves, should be attributed to side-effects of this principle of cognitive development.

universal physical and Classical-artistic types of principles, are to be considered in respect to both their respectively distinct, but also multiply-connected functions.

To repeat a crucial point. For the purpose of the science of physical economy, considered in the relatively narrower sense, the roles of the two kinds of universal principles are distinguished as follows.

First, the validation of discoveries of new universal physical principles, leads to the unique experiments needed to prove those discovered principles. By necessity, those experimental designs, if successful, include features which express the distinct principle of the inquiry. Thus, each such application of a new principle, as in different media, and in different combinations of principles, defines what are to be regarded as new *technologies*, technologies expressed in both the design of products, and of productive and related processes. It is by these and related means, that the measurable power of the individual over nature is increased.

Second, the discovery of such principles and of related technologies, is not sufficient. Although discovery of universal principles occurs, in each instance, within the sovereign powers of cognition of the individual discoverer, the process of transmission of such knowledge, and of its application, *expresses a social process*. Without cooperation among relevant members of society, the propagation and realization of these discoveries and technologies can not occur in such a manner and degree, as to have a notable sort of beneficial effect upon the demographic characteristics of society. Indeed, without such cooperation, such propagation might not occur at all, but remain merely buried clues, merely abandoned experimental apparatus and notes to be found, by future investigations, in what had usually become neglected places.<sup>52</sup>

The relatively extraordinary improvement of the human condition under the influence of modern European civilization, since the Fifteenth-Century Renaissance, illustrates this point most dramatically.

## The modern nation-state

Throughout the history of European civilization, that is to say, throughout the span of recorded and closely related history, the rate of improvement of the demographic characteristics of populations incorporated into modern European civilization, has vastly exceeded the indications supplied by all other evidence, throughout all parts of this planet, both historic and prehistoric. This remarkable advantage is due, almost entirely, to the emergence of the first modern nation-states. That is to emphasize, in particular, the France of Louis XI and the England of Henry VII, during the late Fifteenth

Century, and to emphasize the impact of the rediscovery of America by Christopher Columbus, the latter event the fruit of Columbus's securing a map of the world constructed by a collaborator of Nicholas of Cusa, Paolo dal Pozzo Toscanelli.<sup>53</sup>

Despite the religious wars launched during the Sixteenth and early Seventeenth Centuries, in the oligarchies' efforts to eradicate the idea of the nation-state, and despite the depredations of the modern financier oligarchy of Britain, and elsewhere, since, one net result stands out clearly.

In these days, when sundry Romantics' and lunatics' utopian revivals of feudalism—infantile fantasies about world government, under the rubrics of *free trade*, *rule of law*, and *globalization*, are all the rage, it is urgent to emphasize, that there is but a single factor which is responsible for all instances of that improvement which has occurred within, and under the radiated influence of modern European civilization. That factor has been the emergence of the modern form of sovereign nation-state republic, a republic which, for the first time since the rise of the Roman Empire, recognized the horrid consequences of all efforts to perpetuate world government, which recognized that the only just authority for law and government, lies in the responsibility of the state to promote the general welfare of the entire population, including its posterity.

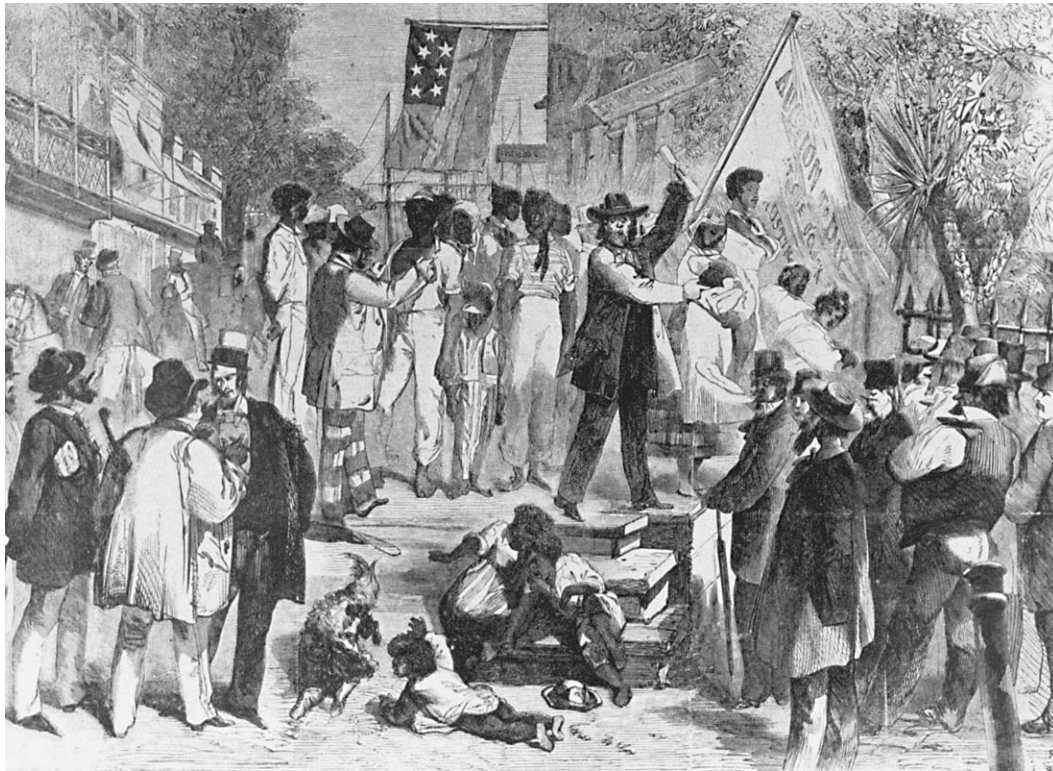
The principle of *Commonwealth* associated with Louis XI's reign in France, and also the following rise of the modern nation-state under Henry VII in England, typifies the long overdue, revolutionary overturn of the hitherto dominant notions of law and government.

Since the Dravidian maritime colony known as Sumer, followed by Babylon, the Achaemenid Empire, the Roman empires, and European feudalism, the power of government and lawmaking was the personal property of either an Emperor and his bureaucracy, or some kindred form of rule by an oligarchical class; under this arrangement, the subject populations were relegated in practice to the relative status of human cattle, more or less according to the same Lockean notion of both slaveholder and shareholder value presently still popular among the ruling financier oligarchies, and their lackeys, of the U.S.A. and British Commonwealth today.<sup>54</sup>

53. From the 1480 letter of Toscanelli to Columbus, as documented through Columbus' son Fernando: "... I send you another such map of sailing. ..." Toscanelli references another close former associate of Nicholas of Cusa, Fernão Martins, through whom Columbus has received a copy of the first version of the map to which Toscanelli refers in the letter. Cf. *The Discovery of the Americas: A Symposium*, *Fidelio*, Spring 1992.

54. Although the long reign of the Habsburgs/Hapsburgs, in the Holy Roman Empire and in Spain, was always under the sponsorship and control of Venice, the immediate base of the Habsburg political power was a princely landed aristocracy. Since Paolo Sarpi's rise to power within Europe generally, the oligarchical factor was divided between two types of feudal-aristocratic formations: the "Conservatives" representing the tradition of rule by princely landed aristocracy, and the radicals, the latter modern-style, Venice-modelled financier aristocracies, such as that which Sarpi developed in England

52. As Albert Einstein referred to the roots of modern physics in Kepler and Riemann: the suppression, and resulting ignorance of the massive work of Kepler, was a key factor in promoting toleration for the scientific incompetence of the empiricists and others over much of the recent four centuries.



*A slave auction in the antebellum South. The cult of “free trade” in the Confederate States of America, as in oligarchical circles of the U.S.A. and London today, is the expression of the moral and intellectual depravity of the oligarchical, anti-nation-state mind-set.*

Since Venice’s rise to imperial power through the Crusades, notably the Fourth Crusade and simultaneous Mongol depredations, and Venice’s launching of those wars by the Venice-controlled Guelph League, which plunged mid-Fourteenth-Century Europe into a New Dark Age, all of European civilization has been, without end, a battlefield, a war between the effort to establish what became the modern sovereign nation-state, and the opposing, reactionary, oligarchical tradition, a tradition led still by that Venetian model of modern financier oligarchy adopted in the Sixteenth-Century Netherlands and London.

Today, as Europe’s technological advantage made possible the present, post-1989 form of domination of the world by the presently decaying vestiges of Anglo-American financier-oligarchical power, all parts of the world are at the mercy of the outcome of the current, global political battle between the forces of the sovereign nation-state, on the one side, and, on the opposing side, that oligarchy which is behind the attempt to subject the planet as a whole to rule by an oligarchical form of new, London-centered Roman Empire, a utopian form of world government. The latter is intended to be ruled by a global, Venice-style financier oligarchy, London’s would-be

new Tower of Babel, as represented by so-called “globalization.”

Beginning with France’s Louis XI, once the modern nation-state, with its Commonwealth principle, had adopted the rule, that the general welfare of the people, and all of the land-area, is the sole legitimate reason for being of government and law itself, the commitment to these improvements unleashed potential rates of physical-economic improvements which had always been feasible, but could not be realized without the kind of social cooperation which only the sovereign form of modern nation-state republic could promote.<sup>55</sup>

The case of Lord Palmerston’s asset, the treasonous slaveholder faction which had created and launched the Confederate States of America, provides a most suitable illustration of the working point. The popularity of the cult of so-called “free trade” in the U.S.A. and London today, and the associated cult of “shareholder value,” are expressions of the characteristic moral and intellectual depravity of the oligarchical, anti-nation-state mind-set.

During the period during which the London-backed U.S. Democratic Party of London-controlled New York banker Martin van Buren and his successors, such as President Woodrow Wilson,<sup>56</sup> ruled that city’s roost of financier politi-

and the Netherlands. Lord Palmerston’s Mazzinian revolutions of 1848-1849, including the installation of Louis Napoleon in France, consolidated the power of financier oligarchy over the dwindling of the princely power which had been led by princely feudalists Chancellors von Kaunitz and Metternich.

55. See this as reflected, for example, in the first three paragraphs, most notably, of the 1776 U.S. Declaration of Independence.

56. Many who justly admire the memory of President Franklin D. Roosevelt, overlook what a moral catastrophe the Democratic Party had been, from its



cal power, the slaveholder's defense of the practice of chattel slavery against so-called African-Americans,<sup>57</sup> had been two-fold. They relied, in argument at law, from the standpoint of the English pro-slavery doctrinaire, John Locke, on the alleged right of liberty and life awarded to property-holders, such as slaveholders, and today's shareholders.<sup>58</sup> They insisted, that the virtual, or even actual enslavement of the black and white victims of that reign, as "Yahoos," was to be deemed necessary to foster the indolent advantage of an allegedly superior species of social parasites, a class of virtual "Houyhnhnms." These were, under the Confederacy, the ruling combination of both the slaveholders and also those who shared the spoils from such practices.

Even at the point the Confederacy had been defeated, the treasonous pack which had unleashed a war for perpetuation of slavery, referred to its preferred order of slave-society as the southern states' "peculiar institution." The so-called Nashville Agrarians, typified by Robert Penn Warren and Henry A. Kissinger's and Zbigniew Brzezinski's Harvard patron, Professor William Yandell Elliot, are prominent among the bearers of that variant of the Confederacy's rabidly Anglo-philic tradition.

The working point here, is that it is a myth, that the wealth of the U.S.A. was based significantly on the proceeds of U.S. chattel slavery. That that slavery in the U.S. enriched and strengthened Nineteenth-Century England: Yes. Of the U.S.A.: but for such degenerates as the southern slave-owning

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founding, through the Presidencies of Grover "Jim Crow" Cleveland and of Ku Klux Klan-booster Woodrow Wilson. The emergence of New York's Wall Street as a center of treason in the U.S.A., began, formally speaking, with the establishment of the Bank of Manhattan by Aaron Burr. Burr was the personal asset of the Jeremy Bentham who had been the head of the British Foreign Office since 1782, the same Bentham who groomed Lord Palmerston for the latter's role in British foreign affairs. Martin van Buren, the New York banker who organized the Democratic Party, and the disastrous Land Bank swindle of the 1830s, and put his protégé Andrew Jackson into the office of U.S. President, continues that tradition of treason traceable from Aaron Burr's Bank of Manhattan through August Belmont, the Cleveland Presidency, the circles of King Edward VII's personal asset, Federal Reserve founder Jacob Schiff, Andrew Mellon, and central bankers Paul "Trilateral" Volcker and Alan "Bubbles" Greenspan today.

57. As the celebrated Civil Rights leader Mrs. Amelia Boynton Robinson repeatedly insists, there is no "African-American" racial grouping. It is to be emphasized, that her argument on this matter coincides in practice with that of the Rev. Martin Luther King whom she led in bringing into Selma, Alabama, for the historic voting-rights battle conducted there. The category of "African-American" exists only in the eye of the beholder, a vision created by the legacy of racist Roman and Venice's Europe, and by Anglo-American slavery. All human beings are distinguished by that common quality, cognition, which sets all persons apart from and above all other species. I employ the term "African-American" only on those occasions when it is necessary to count heads in drawing together ranks of all decent persons into an alliance against the racists, as in mobilizing against the oligarchical faction which has usurped political power in the present-day U.S.A.

58. Who, in today's case, may be demanding a full amount of the expected demand from their investment, but a few seconds after that purchase had been made!

parasites and some U.S. cotton processors, *the U.S. suffered a great economic loss from the existence of the slave-system* and its Democratic Party, "free trading" accomplices.<sup>59</sup>

There is a famous historical parallel, in the degeneration of Mediterranean civilization, following Rome's subjugation of regions of Greek and Hellenistic culture, a cultural and moral decadence datable approximately to the time of the Roman murder of Archimedes. The growth of slavery under the Roman republic and empire, which doomed Rome to its ultimate ruin in a Dark Age, is to be read as a precedent for the role of the treasonous influence of the slaveholder faction and its Wall Street allies in the U.S.A.<sup>60</sup>

Similar appraisals could be made for the relative impact of serfdom upon European civilization; the doubling of the national income of France, during the approximately two decades of Louis XI's reign, is typical. Or, the improvements in Italy, under Hohenstaufen Emperor Frederick II, relative to the plight of Europe under the Guelph League's influence, or the accomplishments in Spain under Alfonso Sabio, are among the historical examples which typify the relationship between changes in political systems and variations in the net productive powers of labor per capita and per square kilometer.

It is the fostering of improvements in economically relevant basic economic infrastructure (e.g., public works), the fostering of improvements in the conditions of farms and farmers, the promotion of general education, sanitation, and health, and improvement in quality and scale of manufactures, which, combined with the fostering of useful inventions, have been typical of the economic benefits brought into being both by the rise of the modern sovereign form of nation-state republic, and also by efforts in that same direction from the lifetimes of Alcuin and Charlemagne. The doubling of the national income of France, under the reign of Louis XI, is typical of the way in which pre-existing forces for improvement in the conditions of life were unleashed, principally, even by as little as simply by curtailing the economically depressive hand of oligarchical tyranny. It was for both his virtues and his wisdom that the British oligarchy hates and vilifies the memory of Louis XI to the present day, almost as they presently vilify the present writer, world-wide.

Compare the relevant lessons from the history of England.

The Magna Carta, an evil, 1215 prank of the feudal Norman barons of England and France, was a reflection of a great turbulence in Europe's affairs which was unleashed in the

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59. Henry C. Carey, *The Slave Trade: Domestic and Foreign* (1853) (New York: Augustus M. Kelley reprint, 1967). Carey's analysis stands up to the present day.

60. The gist of the matter is, that it was the collapse of the Roman Empire as a whole, which caused the successors of the Emperor Diocletian to move the capital to Greece. The shift in capital reflected the superiority of the remains of Hellenistic culture, and population-levels, over the ruined and depopulated regions of the western, Latin-dominated portion of the Empire.



strategically convenient setting of the Mongol invasion, by the notorious Fourth Crusade.<sup>61</sup> Venice's 1204 victory, in conquering and looting the remains of the decaying Byzantine Empire, established its Norman-French-staffed puppet-state, the Latin Empire, and thus tilted the correlation of forces, a tilt which was reflected in the imposition of Norman barons' dictatorship, under the Magna Carta.

The awful effects of the Magna Carta were a part of an unfolding pattern of ruin, rampaging throughout Europe during a period of approximately two centuries. The worst period, beginning approximately 1239, was launched as the Guelph League's war against the efforts of the Staufer Holy Roman emperors, such as Frederick II, to establish reforms empowering the Empire's subject populations, and to build up institutional arrangements which would promote increasing self-rule and general welfare among the subject populations. The wars against Frederick and his followers, continued beyond his death, and that of Dante Alighieri, into the eruption of so-called New Dark Age of the mid-Fourteenth Century.<sup>62</sup>

The usual dating of the formal eruption of that New Dark Age, coincides with the eruption of the 1339-1453 so-called Hundred Years War. It was early in this process, in the preceding, long, 1204-1239 context, that the Norman barons, in 1215, first introduced their effort to prevent King John from building a nation-state. The 1339-1453 Hundred Years War, led to the inevitable ruin represented by the "genetically" ensuing 1455-1485 Wars of the Roses. Thus, at the same time that Fifteenth-Century Europe had begun to free itself from the after-effects of the Guelph League's Fourteenth-Century New Dark Age, the morally degenerate baronies of England, not only sought to ensure their continued looting-control over France, but those same, brutishly foolish baronies drove themselves almost to point of fratricidal extinction in the so-called Wars of the Roses.

The Wars of the Roses were ended only through the defeat and death of Richard III in 1485. This defeat, effected by aid of the forces of the recently deceased Louis XI of France, established Henry VII as the king of a new kind of English monarchy, a state with many features copied from the successes of Louis XI's France. Shakespeare's play *Richard III*, is based upon precise documentation of the circumstances in which Henry VII became king, notably a first-hand documentation supplied chiefly by an eyewitness, the father of a great collaborator of Erasmus of Rotterdam, Sir Thomas More.

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61. The destruction of Kiev Rus by Venice's familiars, the Mongols, compounded by the Mongol invasion of Central Europe, was a key to the weakening of the flanks of Byzantium which made feasible Venice's deployment of the Fourth Crusade for the conquest and looting of Byzantium.

62. Giuseppe Verdi's opera, *The Sicilian Vespers*, represents a page from history which typifies the literate Italian patriot's recollection of Frederick's legacy as the monarch of the Two Sicilies, correctly emphasizing Frederick's enterprise, like the work of Dante Alighieri, as among the great works of statecraft which built the foundations for the later, Fifteenth-Century emergence of the first modern nation-states.

Indeed, the Italian Renaissance-influenced mind of William Shakespeare, has documented, as drama, many of the most precious principles of statecraft to be learned from the history of European civilization up to that time.

## The Renaissance as a revolution

The Fifteenth-Century, or "Golden" Renaissance, was a revival, and partial victory of Classical Greek culture over the Roman imperial, or so-called Romantic culture, the latter which had dominated feudal Europe up to that time. That Renaissance was also a revolution, the type of revolution the world requires again, urgently, today.

Although that Classical efflorescence received a crushing, if not fatal defeat, during 1511-1513, with the triumph of Venice over the League of Cambrai, by aid of its Spanish-monarchy and other accomplices, the history of Europe since the Fifteenth Century, has been shaped by the ebb and flow of the battered but persistent, humanist Greek Classical tradition, in science, art, and statecraft. That essential form of the conflict has persisted, up to the present threat of another New Dark Age, at this present point of global existential crisis.

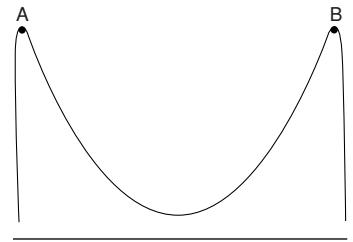
The crucially determining feature of that Renaissance, was the renewed emphasis upon that same Greek Classical notion of the idea which we have identified above, the same notion which distinguished emergent Greek, *Classical* art from its immediate predecessors, those of Greek and Egyptian *archaic* forms. Typified by that representation of *ideas*, which typifies the productions of the greatest among the Greek tragedians, poets, sculptors, by the circles of Plato, and by Plato's admirers among Christian apostles, the peculiar genius of the Renaissance was the kind of emphasis upon the principle of cognition to be found in the earlier combat against medieval irrationalism. That earlier combat against irrationalism, is typified by the courage and wisdom of Abelard of Paris and Dante Alighieri, and by the methods of popular education adopted by the Brothers of the Common Life, of Groote and Thomas à Kempis. In all of this, *the crucial distinction was that between merely learning and knowing*, the emphasis on the principle of knowing, that the student must relive the experience of discovery of original universal principles (e.g., *ideas*), rather than learning to follow, deductively, those mere opinions which are characteristic of taught and learned textbook and dictionary formulas, or of other similarly banal, mind-deadening precedents.

It is crucial for understanding any and all aspects of the emergence of modern European history and the modern nation-state, that the Renaissance was made possible by the terribly painful lessons suffered during and immediately following the preceding, Fourteenth-Century New Dark Age. The Renaissance came as a true revolution. Great revolutions of all kinds, for better or for worse, have usually appeared if and when they did appear as response to some catastrophic failure of a society's generations-long, established customs.



FIGURE 3

**A catenary is formed by suspending a chain between points A and B**



*“The case of Filippo Brunelleschi’s construction of the dome of the famous Cathedral of Florence, typifies the axiomatic sources of the achievements of the Renaissance as a whole.” The surfaces between the ribs of the dome are families of catenaries—a geometrical discovery whose importance has not been sufficiently investigated.*

As indicated above, the decline of European civilization under the successive impacts of Venice’s Fourth Crusade, the coincidence of the Fourth Crusade with the Mongol invasion and looting throughout much of Eurasia, the triumphs of Venice’s Guelph League puppets, and the depopulation of Europe by approximately one-half, during the period of the Guelph League’s wars and triumphs, shattered the authority, and much more, of the formerly triumphant pro-globalist, Conservative (i.e., Romantic) forces. It was the rebuilding of Europe out of the rubble of that New Dark Age created by the Venice-directed Guelph League, which created the opportunity for the great, Florence-centered cultural revolution of the Fifteenth Century.<sup>63</sup>

The case of Filippo Brunelleschi’s construction of the dome of the famous Cathedral of Florence, typifies the axiomatic sources of the achievements of the Renaissance as a whole. If one examines the nature of the problem which Brunelleschi solved, viewing this as would a physicist in the tradition of Leonardo, Kepler, Leibniz, Gauss, and Riemann, one is startled, at first, by the fact that, as early as the middle

decades of the Fifteenth Century, the catenary was used, not merely as a form, but as a physical principle of curvature, to solve the otherwise insoluble problem of construction posed. [Figure 3] Brunelleschi used a “hanging chain” form, to guide the workmen in the construction.<sup>64</sup> Other ruses of a principled nature, used by the same Brunelleschi, including *camera oscura* constructions, afford the modern investigator the means to peek inside the cognitive processes which the great architect mustered in the course of the most notable innovations used in his work.

Similarly, later, at the close of that century, Leonardo da Vinci’s *The Last Supper*, in Milan, demonstrated the scientific principle which enables painting on a flat surface to represent action in “three-dimensional” space-time, to an effect reflected into the mind of the viewer, a design crafted to produce an effect akin to, but of a higher order, than the way in which the greatest Classical Greek sculptors had freed sculpture from the archaic tradition, to be able to carve *ideas* in stone. The same revolutionary principle of painting was employed as a method of artistic composition in other works by Leonardo, by Raphael Sanzio, and in works such as Rem-

63. A demographic collapse caused by policy-changes axiomatically analogous to those introduced, world-wide, since the August 1971 destruction of the old Bretton Woods monetary system. The demographic effects seen globally, especially during the recent decade since 1989, typify the kinship of today’s IMF and related policies to Venetian imperial policies of the Thirteenth and Fourteenth Centuries. If present IMF and globalization policies are continued, today’s demographic results will be similar, but much worse, world-wide, than that New Dark Age which was experienced during the Fourteenth Century.

64. I stumbled into this fact during 1987-1988, when my reflections suggested that the use of the catenary as a method was the only possible explanation for certain crucial features of Brunelleschi’s success. A few months later, the leading engineering expert on the construction showed me the evidence which he had uncovered, which directly confirmed my suspicions. Unfortunately, the discovery of that pregnant historical-scientific fact has received little further attention since.



Rembrandt's "Aristotle Contemplating the Bust of Homer." The artist conveys a startling irony, an idea, on the flat surface of the canvas: It is actually the blind poet Homer who insightfully contemplates the unseeing Aristotle.

brandt's celebrated painting of what is in fact, blind Homer insightfully contemplating the unseeing Aristotle. To achieve this effect, Leonardo combined the development of the discovery of a new universal physical principle of vision with the objectives of Classical artistic composition.

During the same period Brunelleschi was directing the completion of his dome, Nicholas of Cusa published what the collaborators Luca Pacioli and Leonardo da Vinci recognized as the founding work of modern experimental physical science, his *De docta ignorantia*. All of the greatest productions in art and science from that century, until the 1511-1513 triumph of Venice's reaction, and Venice's subsequent orchestration of Europe-wide religious wars, were concentrated in the span of the adult lives of Brunelleschi, Cosimo de Medici, George Gemistos (Plethon), Cusa, Pacioli, Leonardo, and Raphael Sanzio. In that sense, the Fifteenth Century was the period of the virtual rebirth of the period spanning the great scientific and related work of Plato's and Eratosthenes' Academy. The greatest figures of science, art, statecraft, and religion, from the Renaissance period, saw their century in those terms. In other words, its characteristic feature is, that it was a period of a *great renaissance of cognition*, a true revolution, as the one we urgently require today.

From the outset, the opposition to this Renaissance came

from Venice. That opposition had a two-fold expression, philosophical as well as political-strategic. On the philosophical side, the exemplar of the Renaissance's adversaries has been Venice's typically gnostic Paduan, the professed neo-Aristotelean and mortalist Pietro Pomponazzi.<sup>65</sup> In the political-strategic realm, Venice's and Padua's weapons were chiefly its role in bringing about the A.D. 1453 Ottoman conquest of Constantinople, and also its related, central role in orchestrating approximately a century and a half of pre-1648 religious warfare throughout Europe.

In the course of the Sixteenth Century's Venice-directed, Conservative reaction against the Renaissance, most notably during the period following the Council of Trent, the oligarchical faction became divided between a quasi-traditional, pro-Romantic Conservative (e.g., pro-feudalist) faction, and the equally pro-Romantic, radical faction of neo-Ockhamites (the empiricists), led by Venice's Paolo Sarpi.<sup>66</sup> The latter, neo-Ockhamite current is expressed by the Hobbesian mind-set, that typified as the characteristic mind-set of Locke,

65. *Mortalism*, the pro-irrationalist, Aristotelean doctrine common to the Padua school, that the soul is a transitory epiphenomenon of the body, and therefore mortal. Pomponazzi's student and patron, Venice's Cardinal Gasparo Contarini, warned Pomponazzi against the mortal risk of continuing to advocate that doctrine publicly; but, there is no sign that Pomponazzi, even after his 1509 *Defensorium*, actually repudiated the reductionist *method* by which that mortalist view was generated axiomatically. This same pro-bestial doctrine, as argued by Pomponazzi and others, is sometimes an axiomatic correlative of apologies for not only Venice's, but also later Portuguese, Dutch, British, and French practice of African slavery; it always implies that human beings can be assigned to the social-political category of human cattle. As with the Guelph League earlier, the claim to special attributions of mystical moral authority by the oligarchical model of society such as The Divine Right of Kings and other oligarchical doctrines of government, was, like the analogous doctrine of "free trade," always based on the same sort of rationalization which was used by the most despicable apologists for the system of slavery under the Confederate States of America, and also by the U.S. advocacy of so-called "Jim Crow" by certain justices of the U.S. Supreme Court, in President Grover Cleveland's time, and again, as under the pretext of "share-holder value," today.

66. Sarpi, in 1582, at the age of thirty, won a factional battle which established his political leadership among Venice's ruling families. He was a key figure behind the accession of James I to the English throne, the master of household lackey Galileo Galilei, and the intellectual authority behind such adversaries of William Shakespeare's influence as Francis Bacon. Sarpi did more than any single other figure of modern history to establish Venice's intellectual control over London's emergence as the future world capital of a global financier-oligarchical empire.

Newton, Hume, Adam Smith, and British liberalism generally.

During a century and more following the 1648 Treaty of Westphalia, the Classical humanist legacy of the Renaissance came to be centered in the figures of Gottfried Leibniz and Johann Sebastian Bach, and, among religion's currents, both certain Catholic and Protestant currents, as also the reform Judaism of Moses Mendelssohn. The ecumenical political, social, and religious policies of those leading mid-Eighteenth-Century defenders of Leibniz and Bach, Gotthold Lessing and Moses Mendelssohn, typify the general foundations of the late-Eighteenth and Nineteenth Centuries' Greek Classic-rooted, anti-Romanticist renaissance, of which the 1776 U.S. Declaration of Independence and 1789 Federal Constitution were a direct outgrowth.

In most of the national cultures of modern European civilization, the Renaissance tradition has been most often a minority current, often a severely harassed one, both among nominal scientists, and in society more generally. It has nonetheless come to the fore as a crucial shaper of history for a time, as it did with the Winthrops and Mathers of the Massachusetts Bay Colony, and with the founding of the U.S. Federal republic. However, this resurgence of the Renaissance has occurred, only under exceptional circumstances, only during the openings for needed revolutionary change afforded to it by one of the inevitably recurring, systemic breakdowns of hegemonic, pro-Romantic and related pro-oligarchical political-philosophical influences, as the Renaissance itself exemplifies this pattern.

Something similar occurred in Russia under Czar Alexander II. The role of Dmitri Ivanovich Mendeleyev, following his visit to the 1876 U.S. Centennial Exposition in Philadelphia, in applying the List-Carey strategy of railway-centered development, to Russia, reflects the quasi-global spirit of Renaissance which re-erupted in the Americas, Germany, Italy, Russia, Meiji Restoration Japan, the international movement for China by Dr. Sun Yat-sen, and other parts of Eurasia, following the defeat of the British puppet, the Confederacy, under the leadership of President Abraham Lincoln, and the spectacular rise of the U.S. economy to world leadership in rate and level of agro-industrial development, which had occurred during the 1861-1876 period under direction of the influence of leading international economist Henry C. Carey.

Thus, the characteristic feature of European civilization, taken as a whole, has been the following.

To summarize the point we have been developing here, *there are but two leading, opposing currents underlying the entire sweep of that civilization. One is the oligarchical model, as the ancient Greeks recognized this as such, which is typified by the ancient Mesopotamian and Roman-imperial legacy. The opposite is that sometimes termed the Classical humanist model; the latter is properly defined by the development of the conception of the Platonic idea as the characteristic feature of all Classical Greek art, science, and legal philos-*

ophy. Christianity's culture, as expressed by the Gospel of John and the Epistles of Paul, reflects the Platonic tradition adopted by the Christians, which was also typical within literate Jewish and other Greek-speaking Hellenistic culture, as the Christian-humanist correlative of Classical Greek culture of the time of Philo of Alexandria. These respective, Romantic versus Classical humanist currents, are distinguished essentially from one another, by the opposing, axiomatically mutually exclusive *types* of mind-sets which they express.

The common feature, which distinguishes all mind-sets representative of one of these types from its opposite, is an essential difference respecting the functional definition of the nature of man. The first, the Classical humanist type, locates the species-identity of the human individual in the power of cognition, as a principle inhering in, and universal to persons, as distinct from mere learning, and from deductive method generally; the human species is distinguished from all others accordingly. The opposing *oligarchical model*, expresses a directly opposing conception of the human individual, that of the tradition of imperial law, that of either sterile, deductive formalism, or existentialist irrationalism, under each of which latter the majority of humanity is regarded and treated as essentially of the legal form of human cattle, as mere objects of the imperial form of law. Hobbes, Locke, Adam Smith, and Jeremy Bentham, for example, like Kant, Hegel, and Savigny, are examples of the mind-set of what is variously termed Romantic, imperial, or oligarchical law.

The difference between a President Abraham Lincoln and his opponents of both the Confederacy and the Wall Street-controlled U.S. Democratic Party at that time, is an example of this age-old conflict between the Classical humanist and oligarchical mind-set. The conflict between this writer's pro-Franklin Roosevelt faction of the U.S. Democratic Party and the opposing, Wall Street-centered faction, that of such as Vice-President Al Gore, of the same party today,<sup>67</sup> illustrates the differences between the Classical humanist standpoint and the oligarchical standpoint represented by today's echoes of the Nineteenth-Century traditions of Wall Street's Aaron Burr and the southern pro-slaveholder class. In modern European civilization, the mind-set of the Classical humanist type is represented, most commonly, by the view of the principle of what the Preamble of the U.S. Constitution identifies as the general welfare, as the only premise for legitimate forms and practices of government. In modern European civilization, that view of the general welfare is recognized as the modern expression of the Classical Greek notion of the *republican* mind-set, as the founders of the U.S.A. emphasized this connection.

Since approximately the time of the death of Archimedes,

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67. And, also the leadership of today's U.S. Republican Party. Notably both of these pro-oligarchical currents within those two parties' bureaucracies share a common master in the bi-partisan, so-called Project Democracy project, also recognized as the National Endowment for Democracy.

the prevailing conflict between these two general types of mind-sets, has been that which we have identified above, as the opposition of the Classical-Greek legacy to Romanticism. Since the Conservative cultural-political legacy of feudalism was subordinated to the empiricist and related offshoots of the reductionist doctrines of Paolo Sarpi's financier-oligarchical faction, it is the type of Romanticism now typified by Abbot Antonio Conti's Eighteenth-Century Enlightenment salons, the anti-Leibniz, anti-Bach currents of Romanticism, which have emerged as the hegemonic root-type expression of modern Romanticism in both science and art, and in law and politics otherwise.

The liberalism of the Netherlands' William of Orange, as made memorable in bloodied Ireland, and the post-1714 British Eighteenth-Century Liberalism, that depicted by Jonathan Swift's satires and Hogarth's portrait of *The Rake's Progress*, have become both the ideology (mind-set) of British imperialism and, since the 1901 assassination of U.S. President McKinley, the Anglo-American financier oligarchy's now customary hegemony in world affairs. Indeed, if one follows the influence of Britain's notorious Lord Shelburne in defining his proposed Roman model for British imperialism, and examines this in light of Shelburne's protégé and long-term head of the British Foreign Office, Jeremy Bentham,<sup>68</sup> the appropriateness of U.S. President Franklin Roosevelt's war-time characterization of the modern imperialism of Winston Churchill's Britain, as an expression of typically British Eighteenth-Century Liberalism and methods,<sup>69</sup> is not to be considered an exaggeration in the slightest degree.

After President Lincoln's defeat of the British monarchy's puppet, the Confederacy, the strategy of that monarchy for dealing with the U.S.A. was adjusted, with great resentment and reluctance, to the fact of the superiority of the U.S. American System economic model of Franklin, Hamilton, the Careys, List, and Lincoln, but adapt it did: relying more on typically Venetian and British methods for corruption of the institutions and general population of the U.S., than the earlier efforts to crush that republic by force.

A mind-set which demands the supremacy of mere learning, as opposed to cognition, reflects the same oligarchical type (mind-set matrix) as modern Romanticism in general. Here, in that conflict between cognition and mere learning, lies the essence of the essential conflict of mankind as a whole today. Herein lies the principle of Reason expressed in the

form of the modern form of perfectly sovereign nation-state republic, as the U.S. Declaration of Independence and Preamble of the U.S. Federal Constitution typify this.

The conflict between these two types of mind-sets, is most efficiently assessed from the vantage-point of Plato's dialogues. The dialogue among Plato's figures Socrates, Thrasymachus, and Glaucon, in the book best known in English as *The Republic*, is a most convenient reference for this purpose. When that dialogue focusses upon the matter of defining *truth* and *justice*, as through the mouth of Plato's Socrates, it goes to the heart of not only the fundamental issues of law, but also general social policy and science as well. Apply that lesson to the problem before us.

The issue before an imperilled planet today, is the urgency of a new renaissance, to free the nations from the grip of an ongoing plunge into a prospective, planet-wide, New Dark Age. Proceed then as follows, to define the characteristics of such a renaissance.

### Physical economy as such

*All truthful knowledge is revolutionary on principle.* At any moment between successive qualitative phases of its development, the individual human mind can be described, if only in first approximation, as what I have identified, above, as a fixed mind-set: as a manifold composed of what that mind reacts to as presumed true, universal principles, such as definitions, axioms, and postulates. However, in reality, all available, truthful knowledge came into existence, and continues to exist as *knowledge*, rather than as merely learning, only through the kinds of cognitive revolutions which led to the validated discovery of new universal principles. Thus, every mental act which enables the mind to discover a valid new universal principle, causes a literally revolutionary, and inherently impassioned transformation of that person's mind-set.

So, the healthy mind of the child and adolescent, as distinguished from the dullard whose mind-set is deadened by custom, is an ongoing process of successive, developmental revolutions, repeatedly superseding an old mind-set by a new one. That is the essence of all true revolutions. The child and adolescent whose mind is developed into a cultivated one, through a continuing succession of such revolutionary discoveries, is the cultivated mind of an individual qualified to be the citizen of a true and durable republic.

The essence of the human mind is not the fixed mind-set, but, rather, the typical way in which that selected case of a mind-set, as a subject of investigation, is either changed, or resists change.

*Thus, with the mind, as for the universe, nothing is constant except change.* The purpose of studying fixed types of mind-sets, is, like the study of Euclidean geometry, to arrange such assumptions in that orderly way needed, in preparation for discovering what is provably false in such axiomatic assumptions. It is the process by which such successful correc-

68. This is typified by the case of Edward Gibbon, author of the celebrated account of the decline and fall of the Roman Empire. Gibbon, and his book were, like Adam Smith, and Jeremy Bentham, a property of the circles of Lord Shelburne. The point of all Shelburne's extended circle, was the establishment of London as capital of a world financier-oligarchical empire, modelled upon both Venice and the lessons to be learned in following in the footsteps of ancient Rome.

69. Including the British (Anglo-American: Montagu Norman's and Harri-man executive Prescott Bush's) sponsorship of Adolf Hitler's rise to power in Germany



*"The difference between a President Abraham Lincoln and his opponents of both the Confederacy and the Wall Street-controlled U.S. Democratic Party at that time, is an example of this age-old conflict between the Classical humanist and oligarchical mind-set." Here, Confederate Gen. Robert E. Lee surrenders to Lt. Gen. U.S. Grant at Appomattox, 1865. Inset: President Lincoln.*

tions are effected, as typified by an anti-Euclidean physical-space-time geometry, which enables us to free our minds from the deadening grip of childishness and other defective customs, the process which displays the true nature of the real powers of mind to us, that in a provable fashion.

To the extent that the mind-set in question contains no beliefs in falsified such principles, the most immediate, most crippling fault of the mind-set itself is limited to those errors which belong to the category of *fallacy of composition by omission*. Otherwise, the faults of mind-sets include the either implicit adoption of definitions which are false, or false qualities of axiomatic assumptions concerning the way in which the individual principles of the total mind-set are related to one another in practice. Consider the simpler of the two kinds of error first: errors of fallacy of composition among the elements of an aggregation of principles which are, taken one at a time, at least relatively truthful: *fallacy of composition*, so defined solely by *omissions*.<sup>70</sup>

For this specified condition, even if we eliminated the false assumption that space and time are linearly extended, *the essential fallacy of composition of Euclidean and other reductionist thought* would continue to be, that it would represent the attempt to define the mind in terms of a fixed set of axiomatic assumptions, as the Euclidean geometry's classroom does. The essence of the individual human mind, lies, on the contrary, in the principle which generates each and all valid notions of universal principle, the principles which must stand in place of deductive forms of definitions, axioms, and postulates. It is the sovereign cognitive processes of each

individual human mind, the processes by means of which valid discoveries of universal principle are generated, by means of which all valid axiomatic assumptions are generated, which is the essential quality of the human mind, and of truthful human knowledge.

In other words, that essential fallacy of composition, is the pure sophistry, like stoicism, which limits the notion of *fact* to a reductionist's notion of sense-perception, and which locates the events of sense-perception within a fixed, deductive mind-set, as a Euclidean classroom textbook geometry does. It is not our senses which supply us truthful knowledge of the way in which physical space-time is organized. It is our discovery of those validatable universal principles which, like axioms, underlie and control the way clusters of perceptible events could, and can be willfully organized *by us*. These are principles which we prove in the only truthful way possible: if we can show that each such a discovered universal principle enables us to control willfully such patterns of perceptible events, we have gained possession, thus, successively, of efficient, knowable principles which lie, as principles, outside the domain of sense-perceptible objects as such.

The truth of the matter lies not in any one such discovery, but in the continuing process which underlies and orders such a succession of validatable discoveries of universal principle. Those persons whose minds have been accustomed to re-experiencing the acts of valid original discoveries of many before them, and who have acquired the habit of effecting their own original solutions in the same way, are the truly cultivated minds of the type we associate with the greatest scientific and Classical-artistic composers. They compose, not because someone beats them into solving problems, or bribes them with promise of rewards, but only because it is in their cultivated nature, their sense of personal identity, their

70. In other words, for the cases in which the argument omits a principle relevant to the matter being considered, but in which none of the principles taken into account are false in and of themselves.



personal sense of happiness, to be creative. It is those kinds of *ideas*, beyond sense-perception, which define the only truthful meaning of the term *science*.

For example: viewing the verses of *Genesis* 1:26-31 from the vantage-point of science, that is the only method of inquiry by which we might *actually know*, rather than blindly believe, that the import of those several verses is truthful. If man's power of individual cognition enables our species to utter commands, in the form of statements of universal principle, which the universe is always manifestly obliged to obey, then we must acknowledge that each individual member of the human species, acting as an individual for that species, possesses a unique kind of power to exert dominion within and over the universe, and, that, in that light, each man and woman is made equally in the image of the Creator of the universe.

Scientific discovery is the most obvious expression of that power of "dominion." Thus, study of the phenomena cohering with the act of individual cognition, rather than so-called statistical and related deductive techniques, or, even, merely experimental methods as such, is the proper foundation for all study of physical science. The essence of science, otherwise more efficiently termed *epistemology*, is the study of the *process of generation* of those *ideas* which qualify as validated universal physical principles. *It is the study of that entire, ongoing process, as an idea in its own right, which is the essence of the subject-matter. It is that process of generation, which is the proper primary subject of science, a science freed from the shackles of a mind-deadening fallacy of composition, the mind-deadening fallacy known as sense-certainty.*

The applied form of that science of epistemology, is the science of physical economy. That latter science must be defined for practice in the terms appropriate to that connection. In measuring the human species' power in, and over the universe per capita, we must measure the function of the human individual as we have defined the human individual here, that is to say, epistemologically. We are not counting individuals as mere biological objects. We are measuring *the rate of increase of the power* of the typical such, individually sovereign person, in and over the universe. *We are measuring the increase in quality of power represented by the average person, as this is expressed as the increase of the average power of the human species as a whole, in and over the universe.* We are correlating the increase in the expressible cognitive power of each individual, in terms of the demonstrably implied potential improvement in demographic characteristics of life of all persons. We are defining the existence of such individuals as Heracleitus and Plato located existence, within the ontological bounds of a universal principle of change, as the primary form of real existence, as Gottfried Leibniz defined the notion of *monads*.<sup>71</sup> That principle of universal change, located as an

idea *within the simultaneity of physical-space-time eternity*, is the nature of the individual member of our species.

Think of the necessary consumption of an individual of a certain such productivity, in terms of the basic economic infrastructure, conditions of personal life and work-place to maintain a certain rate of increase of that productivity. The result is a decrease in the average surface-area of the planet required to sustain each such individual in an enhanced state of personal existence and power in the universe.

However, there is a complication. Although, measuring things in terms of the previous standard of consumption and supporting investment, old needs are now satisfied more cheaply than before, new needs have been generated, that in order to support the average individual's increased productivity, and also support the new needs associated with continuing to reach still higher levels of productivity.

This and cohering sets of functional relations, define a Riemannian sort of generalized form of characteristic curvature. The relevant question should be obvious: With what does such a notion of ordered, characteristic changes in physical-space-time curvature cohere? Given, what we have already considered, respecting the relationship between validation of universal physical principles and technology, the functional correlative is, the expanding, Riemannian multiply-connected manifold of the principles defined by the realization of such an ongoing process of discoveries.

This set of functional relationships defines, that in the most concentrated way, mankind's relationship to the universe. It is those ideas which meet the requirements of that functional conception of practice, which are the basis for a science of applied epistemology, otherwise identified as a science of physical economy.

## Science, economy, and education

If as indicated, the realization of advances in science and technology is the only ultimate source of net growth in the per-capita standard of living, then a cognitive mode of universal education is the premise of all competent economic policies. The contrast between the cruel Code of the Emperor Diocletian and the educational policies associated with the emergence of the Golden Renaissance, illustrates crucial aspects of this argument.

Under Diocletian's Code, each child considered an object of the general rule was doomed to live in the customary mode assigned to its parents. This brutish law was the curse of mankind under feudal serfdom: men and women were bred and culled as deemed suitable fate for human cattle, and those degraded into the life of human cattle took revenge on society with their own expression of the brutishness that society had induced within them. Freeing a serf from serfdom did not suffice to elevate them from the fate of Dead Souls; they must also be freed from the brutishness of the customs imposed upon the many preceding generations.

A yearning for a return of Europe to a pre-Renaissance

71. It is for such reasons, that all efforts to reduce the analysis of economic processes to the reductionist form of solutions for systems of simultaneous inequalities, are not merely intrinsically incompetent, but virtually insane.

condition, was the mark of the perverted Pre-Raphaelites and sundry swarms of “Guild Socialists” of John Ruskin and the related Fabian circles of H.G. Wells’ and Bertrand Russell’s Victorian England. Bolder pervers from recent decades have expressed the same degraded yearning for “post-industrial” utopias such as globalization. One senses from the action of such folk, that they, in their nightly prayers, might yearn for the return of the old Whore of Babylon. It has been precisely such wretches who have been the principal political cannon-fodder in the campaigns for resuming today the genocidal forms of population-control which the British East India Company’s James Mill admired so much in the effects of induced famines upon the populations of British India.

Without the principle of progress, humanity would not have escaped the depravities of both an imperial and worse past. Without the promotion of revival and continuation of such progress, epidemic and pandemic diseases of man and beast, and of plant-life too, could not merely succeed in greatly reducing the numbers of the world’s human population, but even go so far as to render the human species itself extinct. Unfortunately, as we might observe from recent trends inside the U.S.A. and elsewhere of late, men and women who have degenerated into the pleasure-seeking habits of rutting Yahoos, especially those such from the relatively higher income brackets, are not conspicuous in their concern for the consequences of their folly as far distant as a generation, or even perhaps a much shorter time ahead.

If, as we have indicated, the rate of growth of the stock of validated universal physical principles is the origin of the ability of society to increase mankind’s per-capita power in and over the universe, then a cognitive form of education, as distinct from mere learning of so-called “information,” is the first and foremost principle of a science of physical economy, the first and foremost expression of a policy of promoting the general welfare for both present and future generations.

Education, so defined, signifies not only the mode of life in schools and universities, but also the conditions of life within the family household and local community. It signifies social relations controlled primarily by cognitive forms of activity. This means cognitive activity as typified by the individual’s experiencing the re-enactment of a valid discovery of a universal physical principle. This means that social relations are to be defined in terms of the sharing of the reliving of such cognitive experiences; it signifies that such sharing, as among parents and children, and also teachers and pupils, is the standard by which the moral quality of social relations is to be judged. This, as we shall treat that point a space ahead, is the key to understanding the significance of the role of universal Classical-artistic modes of composition in fostering, and making possible the forms of cooperation upon which durable forms of national economy, and community of principle among nation-states, depend.

With respect to economic policy as such, the proper first principle of the most successful approach to fostering increase

in physical-economic productivity, is what modern terminology would tend to recognize as a *national and global science-driver policy*.

That is to say the following.

The first step toward defining a science-driver policy, is to formulate a view of science as rooted in an expanding set of validated universal physical principles. This view should be conceptualized as a Riemannian manifold of such principles and the technologies derived from it. The object of that definition of science, is to adopt policies whose intent is both, to rid presently taught and practiced science and technology of false principles, and to extend the frontiers of known valid principles.

For example, physical science knows four principal frontiers. First, two frontiers of scale, as associated with the notions of astrophysics and microphysics. This is not a scale of simple extension; rather, as we increase or decrease the scale, we encounter regions in which the characteristics of observable physical space-time undergo changes whose nature must be defined from the standpoint of physics, not formalist mathematics. Thirdly, the cross-over from the characteristics of non-living to living processes, and the reverse. Fourthly, the cross-over from the ability of the relatively lower living species to learn, to the unique cognitive powers associated with the individual person’s physiology. The latter takes into account the fact, that through such cognitive powers the universe has produced a species with the potential to change the way in which the universe behaves.

Thus, for purposes of approximation, we would say today, that the required science-driver program, is represented by an interconnected array of so-called “crash programs” of discovery of new physical principles, concentrating on the frontiers of knowledge for practice in aerospace exploration, microphysics, biology, and cognitive functions. By “crash program,” we should understand ourselves to mean, that through correlating such efforts with intensive development of unique-experimental testing and development of each discovery of either new principles, or new forms of application of principles, we use the fruits of progress in developing new physical principles as such, to give that boost to applied technologies upon which rapid rates of increase of average, physical-economy productive powers of labor are effected.

The policy objective is defined by the notion, that the highest rate of development of physical principles, as seen from the standpoint of the relevant Riemannian manifold, anticipates the relatively highest rate of increase of the productive powers of labor. It is the transformation of the productive powers of labor, so defined, which must define national economic policy, and related cooperation among a community of nation-states.

For such a program, national educational policy must be, that education, whether in classrooms and laboratories, or in social relations generally, must emphasize the principle that the only truthful beliefs are those known through the sharing



of the cognitive act of either original discoveries of valid principles, or re-enactment of the individual process of generating such discoveries made by others within oneself.

In all aspects of life, learning must be superseded by cognition.

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## 6. Epilogue: personal identity and culture

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Both valid compositions in Classical art, and the truthful comprehension of history as a process, are rooted in the individual's act of sharing a validatable cognitive discovery of principle with one or more other human beings. The essence of this sharing is most clearly expressed by the role of Classical metaphor and related other expressions of irony. The typification of this form of sharing, is the revolutionary quality of overturning of false beliefs through the sharing of the re-enactment and validation of a universal physical principle.

In the properly constituted science classroom, this pairwise sharing is the mode through which the pupils relive cognitive moments from the minds of original discoverers who lived generations earlier. By the nature of things, most of these discoverers so encountered by the students have been dead long since. The important qualification is, that the student must not learn these discoveries, but must relive the cognitive process of their original discovery and validation. In that way, the student must make the original cognitive act of discovery his, or her own. That is the functional distinction of knowledge from mere learning.

That is also a profoundly moral distinction. The substitution of mere textbook and classroom learning for knowledge, especially the mere learning of so-called "information," is, in itself, an intrinsically immoral act.

This moral relationship in matters of knowledge, is the bond between the elders and the young. The cognitive relationship among different generations of the living, is the bridge to a kindred, living relationship to all humanity, past and future. Among the living, the relations among elders and younger tend to be masked, misinterpreted, because they are too easily mistaken for mere communication of words and so forth. It is in the moment in which the teacher prompts the student to relive an actual cognitive moment of discovery from the mind of a person long deceased, that that student first senses the reality of humanity as a whole.

It is on this account that the scientific tradition of Plato, Cusa, and Leibniz, shows its great moral superiority, just as Aeschylus, Leonardo da Vinci, Shakespeare, Bach, Mozart, et al. express the continuity of a profound moral superiority of Classical-artistic forms of composition over all alternative forms of entertainment. It is by the sharing of ideas, that in the only way ideas can be shared, by replication of cognitive experiences of discovery of universal principle, that human

beings are consciously bound to one another as human beings.

Thus, only a national culture, and matching educational system, which places the cognitive side of science and Classical art-forms above all other considerations, can hope to escape from those perils of moral decadence, against which the poem of Solon of Athens wisely forewarned his posterity.

It is only when the living cognitive voices of the dead heroes of science and Classical artistic composition, and also the cries of the yet unborn, fill the minds of the living, that the living can be trusted to launch the future, or, as the recent decades' experience of this planet shows, even to continue the past.

Think of Raphael Sanzio's *The School of Athens*. Let each pupil and adult become familiar with each of the historical figures represented there. How should we know each, but by having relived crucial moments from the cognitive experiences of that ancient figure? Then, they have spoken to us in their true view, and we have heard them, be they right or wrong, in our own true mind. Those voices, and our chosen image for their faces, then live within us, as long as we shall live; and we should pass those voices along to those who come after us. All of the knowledge which we have, if it is truly cognitive knowledge, comes to us in that way. To know science, its history, Classical artistic compositions, their composers in that way, to have built up one's own personal "School of Athens" from among the great discoverers of science, Classical composition, and statecraft past, so, and to know history itself from the vantage-point of the cognitive history of such scientific and Classical-artistic ideas, is that condition of the cognitively cultivated mind, which we should demand be fostered among our children, and required of our national leaders.

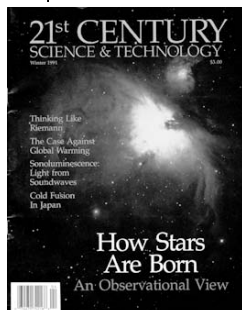
The reason that a mind so cultivated is so uniquely qualified to lead nations, or kindred great endeavors, lies in the quality of conscience which is represented by that individual mind's personal "School of Athens," the faces of those living within him, who sit constantly in judgment on each decision he makes. It is that personal relationship to those still living in the past, and those who must be born and developed in even the distant future, which defines the sense of personal identity of the persons whom Plato recognized as humanity's philosopher-kings.

All of the validatable universal principles of physical science, Classical artistic composition, and ongoing universal history, are located primitively in the quality of relationship between elder and young, teacher and pupil, through which the living cognitive moments of validated past discoveries of principle are relived within the mind of the pupil.

Such concerns, which should be experienced and shared by everyone, have a special importance to those elder scientists and statesmen in their seventies and eighties, who must busy themselves perhaps more than ever before, in the work of preparing the young for the task of bringing forth a future fit for mankind.

## For further reading

*The following is a selection of articles by Lyndon LaRouche and associates on the question of non-linearity in mathematics and physics (in chronological order). See the end of this box for information on how to order. All prices are postpaid.*

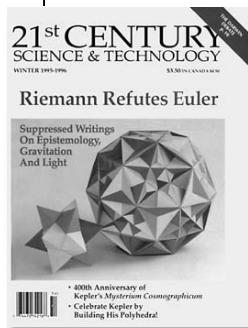


Ralf Schauerhammer and Jonathan Tennenbaum, "The Scientific Method of Bernhard Riemann. Part 1: Riemann and the Göttingen School," *21st Century Science & Technology*, Vol. 4, No. 4, Winter 1991; and "Part 2: Riemann the Physicist," Vol. 5, No. 1, Spring 1992. **\$5 per issue.**

LaRouche, "How Bertrand Russell Became an Evil Man," *Fidelio*, Vol. 3, No. 3, Fall 1994. Includes an extended discussion of the work of Felix Klein. **\$9**

Dino de Paoli, "Georg Cantor's Contribution to a New Renaissance"; Lyndon H. LaRouche, Jr., "No Limits to Growth: Cantor's Concept of Infinity in Economic Science"; Jonathan Tennenbaum, "Cantor and the Future of the Natural Sciences" *EIR*, Aug. 4, 1995. Speeches to a conference in Halle, Germany on May 6, 1995, marking the 100th anniversary of the discovery of the "paradox of the Absolute" by Cantor. **\$12.**

Lyndon H. LaRouche, Jr. takes on the fraud of Isaac Newton in a two-part series: "Why Most Nobel Prize Economists Are Quacks," *EIR*, Vol. 22, No. 30, July 28, 1995; and "Non-Newtonian Mathematics for Economists," *EIR*, Vol. 22, No. 32, Aug. 11, 1995. **\$12 per issue.**



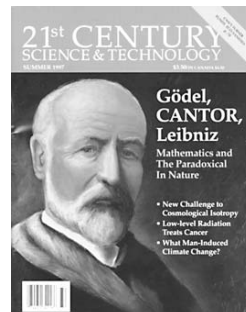
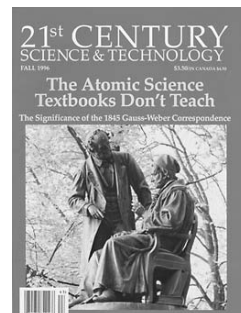
Lyndon H. LaRouche, Jr. "Riemann Refutes Euler," *21st Century Science & Technology*, Winter 1995-1996. **\$5.**

Lyndon H. LaRouche, Jr., "Leibniz from Riemann's Standpoint," *Fidelio*, Fall 1996. **\$9.**

Laurence Hecht, "The Significance of the 1845 Gauss-Weber Correspondence," *21st Century Science & Technology*, Fall 1996. Includes an

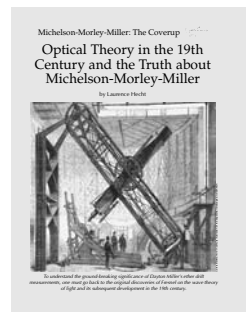
English translation of the text of the 1845 Gauss-Weber correspondence. **\$5.**

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