

# The coming scientific revolution

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Most regular readers of *EIR* will recognize, that much, although not all, of the material brought together in this report, is based upon concepts presented in sundry locations published over the course of the recent decades. Those elements are included here, with other, newly published elements, for a special purpose. They are an integral part of the summation of a new topic: the evidence that broad collaboration among nations in support of the Eurasian Land-Bridge program, will generate a sweeping revolution in mankind's conception of physical science. The more immediate, urgent relevance of introducing that new topic at the present moment of escalating global strategic crisis, is to show the immediate implications of this foreseeable scientific breakthrough for defining what ought to be the strategic thinking of the U.S.A. — in particular — today.

Science, as currently practiced, has reached near the limit at which its progress could be continued in its present form, without freeing it from certain corrupt and crushing, presently widespread conventions. These conventions were introduced to continuing, widespread use by followers of the influential Venetians Paolo Sarpi and Abbot Antonio Conti. Typified by the names of empiricism and Cartesianism then, they represent, still today, a pervasive, systemic, ideological corruption of most of the world's higher education and related practice.

The world could escape from the British monarchy's Blair government and that government's present efforts to drive the world in a race toward global doom. That happy alternative will be found only through the cooperation of President Clinton, joined by at least one leading continental-European nation, with a group of nations centered around China, Russia, and India. Such cooperation would define the new course taken by humanity at the beginning of this coming century. Such cooperation with China, Russia, India, and others must tend to bring about a sweeping revolution in the way in which the world thinks about science.

That revolution is the subject of this report.



*The author's wife, Helga Zepp-LaRouche, speaks with reporters at the eastern terminal of the new Eurasian Land-Bridge in Lianyungang, China, October 1998. "Broad collaboration among nations in support of the Eurasian Land-Bridge program," Lyndon LaRouche writes, "will generate a sweeping revolution in mankind's conception of physical science."*

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## 1. The economic setting

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For reasons I shall point out at an appropriate point in this report, such a revolution were most likely to originate, if at all, from within my specialized field of practice: the science of physical economy. However, although such changes are already implicit, as prescriptions, in my contributions to the science of physical economy, the actualization of that potential for progress along broader lines of scientific work, were presently unlikely to occur during the immediately foreseeable future, without the added factor of some powerful and global, strategically significant political stimulus.

Specifically, unless that inevitable qualitative step upward were, unfortunately, delayed by the world's now threatened plunge into a prolonged, planet-wide "new dark age," the forced-draft technological progress implicit in the present Eurasian Land-Bridge policy, will create the specific set of circumstances needed, to drive scientific progress in ways which will shatter all previously established, present barriers.<sup>1</sup>

At first inspection, those barriers to a revolutionary breakthrough in science, appear to be merely formal ones. At closer inspection, we must recognize that the formal barriers are essentially reflections and products of unresolved pathologies in the presently dominant relations among peoples, both rela-

tions among nations, and even within such putatively democratic nations as the U.S.A. itself. These obstacles are shown most clearly in the domain of economic relations, as I shall identify those connections here.

China's President Jiang Zemin made forceful reference to certain among the science-driver implications of the Eurasian Land-Bridge policy, in his celebrated, path-breaking address at Russia's famous science city, Novosibirsk.<sup>2</sup> In the course of this report, I shall point to the military-strategic, as well as general economic and other social implications of this same matter of scientific principle.

I emphasize, as more or less inevitable, one clearly definable effect of the kind of forced-draft technological progress implied by that Novosibirsk address. Under the impact of such a forced-draft development of the labor-force of Eurasia, the study of mathematics in the secondary and university classroom, will not become merely a rapidly increasing factor in the economic development of Eurasia's vast labor-force and land-areas. This revolutionary expansion of education as a determinant of economic growth, will evolve into standards for instruction qualitatively different than have been used in most Twentieth-Century classrooms, world-wide, including the U.S.A., up to now.

Respecting the formal side of scientific practice as defined up to now, there is nothing new, or in any sense unproven, in what I have said. All of the evidence to prove the thesis

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1. On Eurasia Land-Bridge policy, see "The Eurasian-Land-Bridge: The 'New Silk Road'—Locomotive for Worldwide Economic Development," *EIR Special Report*, January 1997.

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2. The speech was delivered on Nov. 24, 1998, and the official text is published in *EIR*, Dec. 4, 1998, pp. 55-57.

described here, is already solidly “in the books,” so to speak. What has been lacking, until now, is a general recognition of certain deeper implications of discoveries already lying within those libraries. My subject here is the deeper, social implications of those formalities of mathematical physics.

Formally, the basis for this coming revolution in science has already been pre-established by the greatest scientific thinkers of modern European history—i.e., since the Fifteenth-Century, “Golden” Renaissance. The future of scientific progress is to be recognized as already rooted, awaiting broader and fuller appreciation, within the contributions to modern experimental physical science by the leading discoverers of recent centuries, Platonists such as Nicholas of Cusa, Leonardo da Vinci, Johannes Kepler, Gottfried Leibniz, Carl Gauss, and Bernhard Riemann.

It is the roots of physical science, in social relations, which is our principal topic here. It is the issues implicitly posed by the Land-Bridge, specifically the interaction of this Platonic heritage of European civilization, with both the ancient cultural heritages of China and the Vedic-Sanskrit heritage as defined by Panini and others, which will force the unleashing of a new quality of economic and scientific revolution throughout Eurasia, and beyond.

Such a task-oriented revolution in the relations among these and other historical-cultural heritages, will force science to see the practical relations among human beings and nature, including economic relations, in a new way. In that way, the long-awaited unity of civilization, as a collection of perfectly sovereign nation-states united by dedication to certain common principles, can be foreseen on the horizon—if racialist and homicidal fools of the type of mad Zbigniew Brzezinski, presently in high places, do not ruin this wonderful opportunity.

I must emphasize again, that most of the crucial evidence on which the coming revolution in science and economy is to be based, is to be found—sometimes explicitly, otherwise implicitly—in my contributions to exposing the economic significance of the scientific work of those in the Platonic heritage of Cusa, Leonardo, Kepler, Leibniz, Gauss, and Riemann. Thus, as I have said on some earlier public occasions, the source of the breakthroughs leading to the coming revolution in science, will be prompted from within that domain of practice which is my specialty. For purposes of formal academic classification, what I have just written could be restated as follows: It will originate within the domain which is defined by the elementary contributions of principle which I have made to Leibniz’s science of physical economy.

However, habit resists change, even when the evident need for change has been more or less conclusively demonstrated. This resistance assumes a distinctively pernicious character when the folly of habit is hallowed by the name of “custom.” Until the significance of those elementary principles is grasped, sooner or later, by my audiences, it remains frequently necessary, to include at least a summary restatement of the nature and historic importance of those, my origi-

nal discoveries which are key to understanding this coming revolution in science.

In particular, an understanding of those connections is crucial for grasping the nature of the kind of scientific revolution which implementation of the Eurasian Land-Bridge would unleash. It is the commitment to realizing the benefits of cooperation on the Eurasia Land-Bridge program, which will break through the barriers of habit, to force nations to see man, and the relations among man, science, and the universe, in a new way.

To locate the coming revolution in science within the history of economics, consider the following three fundamental facts of modern economic history since the beginning of modern history as Europe’s Fifteenth-Century Golden Renaissance. These three subsequent developments, as elaborated earlier in my *The Road to Recovery* (among other published locations), are listed as follows.

1. The foundations of what Treasury Secretary Alexander Hamilton defined as the *anti-British* (e.g., anti-Adam Smith) American System of political-economy, were supplied by Gottfried Leibniz’s direct influence on those early-Eighteenth-Century followers of the Mathers, Winthrops, and Jonathan Logan, who, including Benjamin Franklin, undertook what became our U.S.A.’s war for independence.

The central feature of this process was adoption of the principles of Leibniz, including Leibniz’s attack upon Locke, as the foundation for the future U.S. Declaration of Independence, the Federal Constitution, and the American System of political-economy.<sup>3</sup>

2. The next step forward in the world-wide development of modern political-economy, beyond Hamilton, was contributed by the same military-technological revolution featured within Lazare Carnot’s victorious direction of the 1792-1794 victory of France over all invading armies.

Carnot’s explicitly Leibnizian principle of machine-tool design, introduced into the U.S.A. after 1814, supplied the foundation for what became the later American industrial revolution of 1861-1876. The success of that 1861-1876 agro-

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3. All the successes which victims of liberal ideology have wrongly attributed to the British “free trade” model of Adam Smith, et al., have been entirely due to the looting of victims by means of parasitical practices known as “primitive accumulation.” To portray honestly the apparent sometime successes of the parasite, it is indispensable to take into account the suffering of its victim, the looted host. By that standard, the only successful forms of modern political-economy have been, in net effect, either the Leibnizian American System of political-economy, as defined by Hamilton, Friedrich List, Henry C. Carey, et al., or adoption of features of the American model of agro-industrial development by other nations, including some so-called “states with socialist constitutions.”

industrial revolution, based upon Carnot's principles, established the model for all the successful forms of agro-industrial national development world-wide, from 1876 onward. The U.S. war-mobilizations of the World War I and World War II period, include some fresh, brilliantly successful examples of resort to the universal principles underlying that American System.

3. The next step upward in economic science, beyond what the 1861-1876 Lincoln-Carey achievement established as the American agro-industrial standard of practice, has come through my original, fundamental discoveries in the field of physical economy.

These discoveries, developed as a refutation of Norbert Wiener's "information theory" hoax, used the experience of application and development of the machine-tool principle of Carnot, as embedded in modern U.S. industrial practice, to show: a) That the origins of increase of the productive powers of labor lie in a succession of validatable discoveries of universal physical, and other principle; b) That the function so described is Riemannian in form; c) That the adducibly universal principles of Classical artistic composition,<sup>4</sup> are the keys to the generation and socialized realization of physically definable increase of the productive powers of labor.

Up to a point, my discoveries serve the relatively more modest, academic purpose of providing needed insights into the principles of economy, principles of successful practice—such as the World War II and later aerospace "crash programs"—whose universal nature is not otherwise adequately appreciated. Beyond that point, in application, those validated universal principles of physical economy, supply the active basis for an entirely new quality of successive scientific and technological revolutions in the increase of the productive powers of labor. It is that point on which attention is focussed here.

The impetus of a technology-driven, revolutionary change in the economic conditions of life on this planet, the impetus implicit in the already ongoing implementation of the Eurasian Land-Bridge program, is the hammer which will drive this spike through all presently existing intellectual barriers. The result will be a far different way of thinking about science and society than is generally known in the university classroom today.

To explain the change from what have been heretofore regarded as more conventional approaches to the subject of

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4. In any of my writings, the term "Classical" means what the Fifteenth-Century Golden Renaissance and the German Eighteenth- and Nineteenth-Century Classic, from Leibniz, Bach, Lessing, Mendelssohn, Mozart, Schiller, et al., regarded as the Classical Greek model associated with Solon, Aeschylus, Scopas, Praxiteles, Sophocles, Socrates, and Plato—not including Aristotle. The rigorous scientific meaning of my usage is emphasized in my "The Substance of Morality," *Executive Intelligence Review*, June 26, 1998, and is addressed at some length within Chapter 2: "The End of the New Age: The Strategic Issue," within my *The Road to Recovery*.

technology, I begin by pointing to almost any modern classroom where students are being given their initial ideological indoctrination in what passes for the calculus today. For this pedagogical purpose, I emphasize attention to the celebrated hoax commonly recognized in the textbooks as "The Cauchy Fraction."<sup>5</sup> I situate the problem posed by that popularized myth within related, popularized misconceptions of the notion of science itself.

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## 2. Ancient and modern science

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What may be termed, meaningfully, "modern physical science," has two distinct aspects. The relevant highlights of the history of modern science, are as follows.

In the known, extended European history of mankind, the history of science so far distinguishes three types of scientific knowledge: 1) Ancient, which, for the case of Europe, refers chiefly to the Classical Greeks' debts to the solar astronomy of the Egyptians, and implicitly to ancient Vedic solar-astronomical calendars; 2) Classical, which refers to Greeks such as Thales, Solon, Aeschylus, Sophocles, Scopas and Praxiteles, Plato, and the continued work of Plato's followers into the pre-Roman Hellenistic period; and 3) Modern Classical, signifying chiefly the rebirth of the Greek-Hellenistic Classical approach to knowledge as associated with Europe's Fifteenth-Century freeing of western Europe from the burden of Roman decadence, through a vigorous, chiefly Platonic revival of the Classical Greek tradition.

These distinctions are functional, not necessarily defined strictly by datings of so-called "periods." For our purposes here, the most relevant functional distinctions are of the following types.

The term "Classical," as applicable to the cases of ancient Greek and pre-Roman Hellenistic cultures, is typified by the revolution in sculpture associated with the work of Scopas and Praxiteles: the superseding of both the Egyptian and Greek Archaic sculpture, by the art of poetic metaphor—a body captured in mid-motion—in stone. "Classical," as a term used strictly to identify a characteristic functional quality, signifies the emphasis upon empirically validatable discoveries of universal principles. Classical is thus opposed to

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5. Formally, the evidence showing Cauchy's "fraction" to be a hoax, demonstrates that Cauchy's argument not only represents an elementary, axiomatic error of fallacy of composition, but a willful such error, and therefore a fraud upon science. The original calculus, developed by Leibniz in response to a challenge published earlier by Kepler, was based upon the evidence that regular trajectories within the universe are expressed by observable non-constant curvature recurring in infinitesimal intervals of such action. In other words, directly contrary to Leonhard Euler's fraudulent attack upon Leibniz's calculus, action in the universe is characteristically non-linear in the small. Cauchy, a protégé of the anti-Leibniz Laplace, revised the Leibniz calculus by insisting, by aid of a fraud, that action in the universe is either intrinsically linear in the infinitesimally small, or is so nearly linear that it may be treated, by linear "curve-fitting" methods, as if it were axiomatically linear.

naive “realism,” or the latter’s more degenerate form, “sur-realism;” it is opposed to a reading of symbolic intent of representations of sense-impressions. “Classical,” thus, signifies not only ideas, as Plato defines this notion of idea; it emphasizes the distinction of conceptions governed by a principle of truthfulness, as Plato’s dialogues portray this. Ideas, whether those of physical science or of art, are conceptions whose validity as expressing a universal principle can be empirically demonstrated.

It is this working, functional definition of “Classical,” which defines the meaning of European civilization, as one beginning with the emergence of Classical Greek culture as the well-spring for defining, as the poet, tragedian and historian Friedrich Schiller did, all of the characteristic features—both good and bad—of European history and civilization.

Modern Classical knowledge, as defined by the Classical-Greek revival associated with the influence of Dante Alighieri and the Fifteenth-Century Golden Renaissance, is distinguished from the ancient Greek Classic by two features. The first of these features, is the cumulative impact of Christianity upon the Classical Greek, chiefly Platonic usages of Apostles, as typified by John and Paul; and the second, the political and social revolution which emerged, nearly a millennium and a half later, as the Golden Renaissance’s expression of the application of the Christian view of Plato’s outlook on the lessons of the Classical Greek legacy.

For modern statecraft, the essential feature of the Golden Renaissance, is that it created that new principle of law later enthroned in the Leibnizian U.S. Declaration of Independence and 1789 Preamble—the “general welfare clause”—of the U.S. Federal Constitution. For the first time, beginning with the reforms introduced by France’s Louis XI, states were established, in which the sovereign was obliged to a definition of law consistent with that which Plato puts in the mouth of his *Republic*’s Socrates. This is the Christian notion of a society in which no person can be reduced to the status of virtual human cattle, in which the sovereign is accountable to the fact that each and all persons and their posterity are men and women each made equally in the living image of the Creator. This is a principle which the U.S.A.’s traditional adversary, the Hanoverian British monarchy, has refused to tolerate to the present day.

The centuries-long struggle, by such as Abelard of Paris and Dante Alighieri, to launch a new order of law in society, the order introduced by the Fifteenth-Century Golden Renaissance, placed the emphasis upon the development of the knowledge of the individual as the Classical Greek legacy defined knowledge, as Scopas and Praxiteles’ poetic metaphor of mid-motion captured in stone, typified knowing. It signified changes in social practice consisting with this principle of knowledge. The benefits of this Renaissance social revolution include the Classical artistic and scientific tradition traced from such figures as Leonardo da Vinci and Raphael Sanzio.

That Renaissance is a still-uncompleted revolution, whose next development we may foresee in the implications of the Eurasian Land-Bridge. We may foresee the unfolding, thus, of a new, higher conception of the human individual, and of the relationship of man to mastery of the universe.

Consider thus the distinction between the two leading aspects of today’s practiced modern science.

The first aspect of the history of modern European science to be considered, is what was termed by the Fifteenth-Century founder of modern European science, Cardinal Nicholas of Cusa, as the principle of *de docta ignorantia*.<sup>6</sup> This was Cusa’s revival of the scientific method of Plato; but Cusa stated that principle of method in a new way, a way illustrated by Cusa’s revolutionary insight into Archimedes’ error of principle respecting the estimated value of *pi*.<sup>7</sup> This was Cusa’s discovery of what we know today as the domain of transcendental cardinalities. This inspired such leading followers of Cusa’s work on scientific method as Leonardo da Vinci and Johannes Kepler.

Kepler’s discoveries led directly to the unique discovery of the true calculus by Leibniz. That heritage of Cusa’s contributions forms the foundation of the modern method of what were termed by Riemann *unique experiments*. These are experiments which test matters of universal physical principle in an appropriately unique way. A conceptually cruder, less rigorous version of the same experimental method, is associated with the term “crucial experiments.”<sup>8</sup>

The second, problematic aspect of this same science, is the use of today’s generally accepted, formal methods of description, such as species of mathematical systems based on the axiomatic presumption that action can be represented as linear in the infinitesimally small interval. The naive pre-

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6. *De Docta Ignorantia (On Learned Ignorance)*, trans. by Jasper Hopkins as *Nicholas of Cusa on Learned Ignorance* (Minneapolis: Arthur M. Banning Press, 1985).

7. The positivists object to the fact that it was Cusa who discovered the transcendental cardinality of *pi*. This objection is rooted in a fraud concocted by Leonhard Euler, who insisted that mathematics must be limited axiomatically to the assertion that both physical action and space-time are linear in the infinitesimally small. Euler’s fraudulent definition of *pi* on this account, led to the dubious results which Felix Klein claimed for Hermite and Lindemann. Cusa’s point is that *pi* lies within the elementary character of action defined by a spherical surface, a surface of constant curvature, and thus excludes any purely algebraic determination such as that attempted in Archimedes’ squaring of the circle and parabola.

8. If there are *n* number of previously validated universal physical principles represented by an existing hypergeometry (multiply-connected manifold), and a newly proposed such principle, *n+1*, is to be tested for validity, the experimental test required must show physical proof that the characteristic curvature of physical space-time corresponds to the manifestly included existence of principle *n+1*, rather than of *n* alone. That argument, featured within the concluding portion of Riemann’s 1854 habilitation dissertation, defines the notion of *unique experiment*, as distinct from the less precise notion of “crucial experiment.” In other words, to qualify as a validated new physical principle, the experimental test designed and run, must prove that the principle is uniquely universally true.

sumption, that such systems could describe the actual interrelations and applications of such actually, or allegedly discovered physical principles, is probably the most crippling, and widespread delusion of the mathematics classroom today. Here lies the crucial problem, the stubborn barrier to progress, within contemporary scientific practice. It is that barrier which is to be broken. It is precisely that barrier which must give way to the impacts of global partnership on behalf of the presently ongoing Eurasian Land-Bridge program.

The corrupt element, the pervasive error within most mathematical instruction, can be examined on two levels. It can be described in formal terms, bearing upon the proofs provided by experiments. The formal proof of that point is elementary, if not necessarily simple. To understand how and why that error persists, presents a deeper, more interesting challenge. It is the second, deeper aspect of the problem which points directly to the social effects of mobilizing much of the world in cooperation around the Land-Bridge program. We proceed now, so.

The intellectual barrier to scientific progress is commonly expressed, currently, in the following form. Contrast a good education in physical science to that always crippling, sometimes outrightly destructive ideology customarily imposed upon the same future scientist in the department of mathematics.

In any competent program of education in physical science, the same method associated with Wilhelm von Humboldt's Schiller-Humboldt program of Classical Humanist education is emulated. This is an outgrowth of the same Platonic approach developed earlier by Renaissance teaching orders such as the Brothers of the Common Life, and by the Oratorians who educated Gaspard Monge and Lazare Carnot. In the physical-science side of the curriculum, the principle of Classical-Humanist methods of education, is illustrated in practice by the roles of both the pedagogical and research laboratories of the better colleges and universities.

In the better programs of science education in secondary and higher education, the function of the well-organized pedagogical laboratory, is to focus the student's attention on the experimental evidence which proves each universal physical principle featured in the curriculum. The student's assignment is to reenact the original act of discovery, and to work his, or her way through the design and conduct of the experimental proof which demonstrates the discovered principle to be a truly universal one. The requirement is, that the proof itself must be physical, not merely a physical illustration of some deductive construct. The principle of unique experiment applies.<sup>9</sup>

Thus, no student should consider that he or she has actual knowledge of a principle, if the student has become acquainted with the name of that principle solely through deduc-

tive methods. Knowing begins when one steps outside the bounds of deductive formalism, and enters the higher domain of creative discovery, non-deductive cognition. It is the business of mere pedants and gossips "to learn;" it is the practice of science to learn nothing which one does not know through non-deductive methods of cognition.

Validatable physical principles can be discovered only as solutions for those kinds of true ontological paradoxes which have no deductive solutions. The discovery of the principle occurs solely within the opaquely sovereign confines of the cultivated cognitive processes of individual minds — never by

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deduction, nor by consensus. The proposed solutions so developed by individual cognition, must be proven to be uniquely, universally true, by appropriate experimental methods.

The development of the cultivated mind of a prospective and actual scientific thinker, occurs almost entirely through the replication of such paradoxes and their validated solutions. The object of a modern scientific education, is to have the student replicate each and all of the most important of the known discoveries of validated universal physical principles, since (chiefly) the Ionian Greeks.

The foundation for this cultivation of the future scientific mind is properly laid within a Classical Humanist form of secondary education, for which the Schiller-Humboldt model is the most suitable example. On the secondary level, the pivotal ancient and medieval discoveries are to be featured, as discoveries whose proofs are to be replicated by aid of pedagogical experiments. In the college and university, modern discoveries of universal principle are replicated and their implications explored, with heavy, increasing emphasis upon pedagogical experiments of a unique quality.

This approach to the development of a future cultivated scientific mind, has the intended effect of bringing the physical universe as it is known to date, within the compass of the student's mind. This result is secured by recognizing that all actual present knowledge of the physical universe, is represented by a finite, but large aggregation of validated, or otherwise validatable discoveries of universal physical principle. The interrelated function of the classroom and pedagogical laboratory, is to ensure that the student reexperiences the cognitive equivalent of the original discovery and validation of each universal physical principle adopted as knowledge.

Lies and related corruption are to be avoided in this way,

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9. Bernhard Riemann, *Über die Hypothesen, welche der Geometrie zu Grunde liegen* (1854).

by banning from the classroom and scientific practice, all notions that proof can be supplied on the sole authority of deductive (e.g., inductive) constructs. Such emphasis upon knowledge, as opposed to the corruption inherent in mere learning, is the core mission of the pedagogical laboratories.

Still within the span of suitable university science-education programs, there is also the more advanced mission of the research laboratories. We distinguish the pedagogical laboratories as the work of replicating earlier known discoveries of principle and their applications. We assign the name “research laboratories” to university and other programs which are applying the mind cultivated by replication of prior discoveries of principle, to attacking the task of discovering hitherto unknown principles.

In the university science program, the essential qualification of the scientist must include some validated successful discovery of a universal principle, or its new type of application. The latter, qualifying assignment, is prescribed as necessary to demonstrate to the student, as also to the relevant university, or research laboratory, that the graduating student’s mind is truly a scientifically cultivated one.

It is that impassioned cultivation of the individual’s cognitive processes, which is the essence of the development of the scientist, in universities or comparable circumstances.

Such discoveries of principle can not be made by deductive methods, such as “methods of blackboard mathematics.” Deduction relies upon a prior set of definitions, axioms, and postulates. Deductive methods can produce nothing better than new theorems, which are called theorems because they are consistent with previously adopted sets of definitions, axioms, and postulates. The essence of a validatable new discovery of universal physical principle, is that it adds a previously unknown principle to the axiomatic requirements for future acts of deduction.<sup>10</sup> By definition: Such a principle could never be generated by deductive methods.

That said, now turn to the second aspect of most secondary and university scientific education: mathematics. Consider now: Where does most contemporary mathematics instruction go wrong? What is wrong with the all-too-prevalent blind religious faith in “generally accepted classroom mathematics”? Focus on the worst, and therefore the clearest cases, the positivist doctrinaires, such as Bertrand Russell and his acolytes Norbert Wiener and John von Neumann.

The typical, implicitly fatal error of most of today’s opinion about mathematics, is the stated, or implied presumption, that we ought to be able to prove that any valid discovery of physical principle ought to have been susceptible of discovery mathematically, by reliance upon deductive methods.

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10. Also, as Riemann emphasizes in the opening paragraphs of his 1854 habilitation dissertation, such experiments lead to ridding the classroom of the adoption of those definitions, axioms, and postulates which are purely *a priori* concoctions, such as those of Immanuel Kant, and thus absurd on principle.

The unique source of inescapable incompetence introduced by reliance upon deductive methods, is the fact that the operation called deduction (or, inductive methods) is intrinsically linear in the same sense that the method of René Descartes and his like, such as the rabidly anti-Leibniz Leonhard Euler, defines action in space-time as essentially *linear on principle*. Action in the real universe is never linear on principle—linear causality does not exist outside the fantasy-life of the formalists, but all deductive mathematical methods implicitly presume, axiomatically, as Galileo did, that it is always linear.

The worst, and usually the crudest version of such perverted thinking about both mathematics and physics in general, is echoed, and also prefigured, in today’s customary way of thinking about accounting, especially the misapplication of so-called principles of financial accounting to matters of cost accounting. On this account, formerly, prior to the outright mass-insanity which took over economic policy beginning the late 1960s, the most common cause for business failures among manufacturing firms which should have been continuously successful, was the meddling of financial accounting varieties of thinking, into the functions of production and related aspects of cost accounting.

The cases of the Dutch tulip bubble, and the John Law bubbles of the early Eighteenth Century, are precisely examples of such mentally deranged forms of misuse of simple kinds of mathematical thinking. The most lunatic form of financial accounting, is the application of so-called “monetarist principles” to the management of private firms and even government itself. The psychotic extreme of such monetarist babbling, is the systems-analysis doctrine of the late John von Neumann, as typified by that systemic lunacy of Morton-Scholes, which, during August-September 1998, ruined so many of the fools investing in hedge funds, such as those of Vice-President Al Gore’s backers from the world of crisis-ridden Long Term Capital Management (LTCM).

Such examples from the domain of mere financial accounting, are cruder expressions of the same problem which cripples the teaching of science in the less scruffy of today’s institutions of secondary and higher education. Whether in such crude forms, as the blundering assumption that financial accounting supplies the basis for cost accounting and economic analysis, or in the domain of mathematical physics, the foolish assumption is, that cause-and-effect is essentially mechanical, that causality itself is axiomatically linear in its actual nature.

Focus upon the root of that disorder of the typical mathematics department.

## Man and nature

To uncover the root of the fallacy of linearity, we must recognize the origins of empiricism, positivism, and related sorts of formalism, as a kind of social disease. This disease is a misconception of man’s relationship to the universe, a widely

practiced misconception, which is rooted in a mechanistic opinion, such as that of Britain's Adam Smith, respecting the nature of the human individual.

On account of that presumption, the foolish mind assumes that reality is defined by the kind of sense-perception which the behaviorist (and Britain's Adam Smith) attributes, equally, to man and to the lower forms of life.<sup>11</sup> The foolish mind denies, as "a metaphysical presumption," the way in which, in fact, the human mind has enabled our species to transform man's relationship to nature. It denies man's cognitive power for increasing our species' willful power in, and over the universe, as no animal species can do.

Such perverts deny, as Adam Smith does, for example, every bit of evidence which corresponds uniquely to such a willfully directed change in man's relationship to the universe. Their depraved view of man is of "a higher version of the great apes." This same pathological view of man, served as the basis for the Cartesian and similar pathological choices of physical space-time manifold proposed by Galileo, Descartes, Newton, et al.

Thus, whether the topic of the hour is mathematics, or something else, the all-too-typical modern university classroom's instruction, especially among such populist rabble as the empiricists and radical-positivist mathematicians, usually begins with a purely ideological, arbitrary presumption. This is the presumption which is virtually a religion among today's subjects of the heathen British (e.g., "brutish") monarchy. The positivists, like other behaviorists, presume, explicitly or otherwise, that the secrets of human behavior have their primitive expression in the behavioral characteristics of either the higher apes, or even broader samples of animal behavior.

All actual scientific progress, on the contrary, begins from focus upon that experimental evidence which shows the elementary and absolute distinctions between the essential characteristics of human behavior, and that of all lower forms of living beings. The origin of this axiomatic distinction, is the non-deductive, cognitive processes through which validatable discoveries of universal principle are generated by human beings.

Physical science, in particular, focusses upon a characteristic of the human species which both the empiricists and Immanuel Kant, for example, denied to exist as a knowable reality. They deny that developable quality of sovereign human individuals for generating validatable discoveries of universal physical (and other) principle, which is rightly named *cognition*. By cognition, I signify, as I have done in my *The*

11. Adam Smith, *The Theory of the Moral Sentiments* (1759). Here Smith follows the doctrine of the rabidly immoralist Bernard Mandeville's *The Fable of the Bees or Private Vices, Public Benefits* (London: 1934, reprint of 1714 edition). However, in his 1776 anti-American tract, *The Wealth of Nations*, Smith, this time plagiarizing the pro-feudalist, irrationalist *laissez-faire* dogma of French Physiocrats Quesnay and Turgot, makes the same argument, respecting human nature, as he does in his 1759 treatise on the "moral philosophy" of David Hume.

*Road to Recovery*, the discovery of uniquely validatable universal principles, by creative-mental processes whose methods lie beyond, outside, the realm of deduction.

The opposition to the conception of human cognition, such as the opposition from the empiricists, Cartesians, Kantians, and modern positivists and existentialists, has a long tradition within the history of extended European civilization. This tradition, known generically as "reductionism," is typified by assorted cases such as the Eleatics, sophists, Aristoteleans, stoics, Epicureans, and by those modern positivist currents, including empiricism, which trace their intellectual ancestry from the medieval figure of William of Ockham. In today's typical mathematics classroom, this tradition is most commonly expressed in the following way.

In today's classroom, especially the mathematics classroom, what is usually presented as elementary scientific method, is a conceit which originated with Paolo Sarpi, the pro-Ockhamite head of that political faction which, in 1582, gained leadership of Venice's world-ranging financier oligarchy. British empiricism is directly a product of Sarpi's adoption of Ockham. Sarpi's English asset Francis Bacon copied this. It is more often presented today in the form presented by Sarpi's personal household lackey, Galileo Galilei, and in the forms Galileo's fraudulent method was employed both by Galileo's personal pupil Thomas Hobbes, and by René Descartes. It is what is usually known, in mathematics classrooms, as the empiricist, Cartesian, or positivist method. It is this method which defines the barrier now menacing future scientific progress.

It is this latter barrier, which the Eurasian Land-Bridge effort must demolish in its pathway to progress.

### Example: constant curvature

The factual, anti-scientific absurdity of the arguments of Sarpi followers such as Galileo, Descartes, Newton, and Euler, and the empiricists and positivists generally, is demonstrated in the most elementary, formal way, by reference to the matter of spherical, as opposed to linear action.

The most ancient of the reasonably accurate solar-astronomical calendars, some datable to deep during the last period of glaciation of the Northern Hemisphere, all express a certain way of thinking about those related sets of propositions involved in construction of such calendars, and in problems of ancient oceanic and transoceanic astrogation.<sup>12</sup> Classical

12. The astronavigation used by the navigator Maui for Egypt's 231 B.C. discovery of South America, a trans-Pacific voyage based upon discoveries of Eratosthenes, reflects a sophisticated version of already very ancient methods of astronomical, geodesic, and transoceanic astronavigation developed by the Peoples of the Sea thousands of years earlier. See, Lyndon H. LaRouche, Jr., "The Toynbee Factor in British Grand Strategy," *EIR Strategic Studies*, July 10, 1982; and "Go with the Flow: Why Scholars Lied about Ulysses' Transatlantic Crossing," *Executive Intelligence Review*, Nov. 20, 1998. When Eratosthenes' measurement of the Earth's circumference along Great Circle routes is viewed in light of his student Maui's application to



Greek outgrowths of such calendar and astronavigational designs, are reflected in such writings of Plato as his *Timaeus*, one of the locations in which he addresses the implications of the five regular solids. Plato's argument is that the fact that the most characteristic form of action in the universe defines a universe in which action is elementarily spherical, is expressed through such products of what Carl Gauss defined as the generation of the *Pentagramma Mirificum*. The metrical characteristics of action within this universe are, therefore, those of a universe defined, in first approximation, as elementarily one of constant curvature, rather than straight-line (linear) action.

It must be stressed, that when we speak of a form of action which, in itself, defines an axiomatically curved trajectory, such as a planetary orbit, we are not speaking of curvilinear pathways generated by curve-fitting with straight lines, as Galileo and Newton do. We are speaking of a universe in which elementary physical action is *intrinsically* curved, not something to be constructed from the false assumption, that action in its most elementary form is to be defined as a body moving according to an impulse exerted, axiomatically, along blind religious faith in straight lines.

The examination of the notions of "equal time," as by Huyghens, Leibniz, and Bernouilli, in comparison with actions along straight-line and cycloid pathways, and "shortest time" in respect to the same cycloid, are classical Eighteenth-Century illustrations of the point as made for the case of constant curvature. There are also, in reality, as Kepler was first to discover, in devising what are crudely misrepresented as his "three laws," trajectories whose regularity is that of non-constant curvature: a principle proved by Gauss's demonstration that the orbit of the asteroid Ceres is of that type which Kepler defined for a missing planet which had disintegrated earlier.

Kepler discovered what became the prompting of Leibniz's unique discovery of the calculus, that the solar system is organized on the basis of non-constant, rather than constant curvature. That is not in contradiction with the fact, that, even after we know that the universe is characteristically of the Gauss-Riemann type, still, the case for constant curvature remains a durable, sufficient proof against the elementary absurdity of the Galileo-Descartes notion of linearized physical space-time.

Non-constant curvature, as defined first by reference to generalized conics, and then the later hypergeometries (multiply-connected manifolds) of Gauss and Riemann, on which my work in physical-economy depends, are comprehended

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astronavigation, and the history of ancient calendars examined from the standpoint of Gauss' unique discovery of the orbit of the Asteroid Ceres (Jonathan Tennenbaum and Bruce Director, "How Gauss Determined the Orbit of Ceres," *Fidelio*, Summer 1998), and such phenomena as the equinoctial cycle included in ancient Vedic solar-astronomical calendars dating from earlier than 4000 B.C., one is forced to reconstruct the mind's eye of those ancient cultures derived from the earlier Peoples of the Sea cultures.

by the student on the basis of conceptualizing the simpler case for elementarity of constant curvature. The proof for the case of a universe of constant curvature, prefigures the demonstration of the anti-scientific fallacy of all notions of a linear, aprioristic ordering of physical space-time.

Once we grasp the notion, that elementary physical action cannot be defined by a linear trajectory, but rather, a trajectory which is either intrinsically spherical, or of regularly non-constant curvature, the delusion spread by the Galileo-Descartes-Newton legacy is broken. Then, we are obliged to return to the successive standpoints of Kepler and Leibniz, and to proceed, in turn, to the standpoint of the hypergeometries of Gauss and Riemann. When that is done, and not until that is done, a certain degree of sanity is brought into the modern mathematics classroom.

Such a correction represents a great, and indispensable improvement. However, it is not yet sufficient. That accomplishment poses devastating paradoxes to any mind still clinging to the delusion, that the nature of the physical universe is to be adduced from simple sense-perception. Defining the paradox, as the notion of spherical, or non-constant curvature does, is a great step forward. The issue can be described from the standpoint of formalities; but, the true solution for the problem lies beyond such mere formalities. We must go deeper, beyond mathematics, to find the physical solution for that paradox.

The search for the needed physical solution, forces the scientist to uncover the political roots of that stubborn insanity which dominates most modern mathematics classrooms and textbooks. If the scientist refuses to attack this problem politically, he will fail to find the solution. The scientist, if he or she is to be successful in his quest, must focus upon the exemplary political root of Sarpi's empiricist perversion of mathematics: Sarpi's degraded, typically Venetian misconception of the nature of the human individual.

In other words, we must extirpate the empiricist's brutish misconception of human nature which British agent-of-influence Henry A. Kissinger traced to Thomas Hobbes.<sup>13</sup> If someone says to you, "My interest is in science; I have no interest in politics," you should respond: "Then, why do you attempt to disguise your rotten politics with the name of 'mathematics'?"

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### 3. Science and politics

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One never really knows science, especially the mathematical side of physical science, until one has come face to face

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13. Henry A. Kissinger, "Reflections on a Partnership: British and American Attitudes to Postwar Foreign Policy, Address in Commemoration of the Bicentenary of the Office of Foreign Secretary," May 10, 1982, at the Royal Institute of International Affairs (Chatham House), London. Excerpts are published in *EIR*, Sept. 22, 1995, p. 33.

with the fact that the great fights within modern European science have all been essentially political, and that in the most literal sense of the term “politics.” If one remains ignorant of, or refuses to recognize the naked political thuggery of the fraudulent attack upon Leibniz by the so-called Newtonians, refuses to recognize the fraudulent nature of Cauchy’s radical revision of Leibniz’s calculus, and refuses to consider the fully warranted fear of political persecution which prevented Gauss from unveiling his youthful original discovery of a non-Euclidean geometry, one does not understand science. Until one sees science in itself as such a political issue, one remains essentially, functionally, a dabbler in the most essential issues of defining the strict meaning of the term “science” itself.

The fact that the Venetian network directed by Abbot Antonio Conti, coordinated dirty political means in creating and deploying Conti’s pro-Newton witch-hunt against Leibniz and his work, is not the extent of that which may define issues of science itself as a political issue. The deeper issue is not that many scientists engaged in dirty political methods for their factional affrays. The deeper point is, that the most important of the issues over which these battles are fought are dirty politics in and of themselves, regardless of the choice of factional tactics employed in the fray. So, what is widely regarded as the “scientific methods and principles” of a Galileo, Descartes, Newton, Cauchy, et al., was never anything but dirty politics in and of itself, regardless of the choice of tactics for the debate.

To uncover the prejudice which drives the brainwashed victim of the empiricist-positivist classroom into hysterical defense of Galileo, Descartes, Newton, Euler, Cauchy, et al., we must recognize that the so-called principles for which the battle is fought, are such dirty politics in and of themselves. We must go a step further. We must locate the source of that dirty passion itself in its social root, its root in social relations within and among nations.

As I have addressed this afresh in my *The Road to Recovery*, the gut political issue of modern European science, is the quarrel for, and against the Christian principle upon which that science was premised by its founder, Nicholas of Cusa: the principle, that the distinction which sets each man and woman apart, as made in the image of the Creator, is that power of cognition which Cusa associated with his Platonic principle of *docta ignorantia*. That power of generating validatable discoveries of universal principles, expresses what is sometimes termed “the divine spark of Reason” innate in each human individual. That power is what defines each person as set absolutely apart from and above the brutes, as made equally in the living image of the Creator.

The opposition to this Christian principle came chiefly from the combined imperial legacies of Babylon, Rome, and Byzantium, as those imperial legacies, such as the Code of Diocletian, have an axiomatic expression in the crucial features of western European feudalism. The emergence of

the Renaissance reflected a long political struggle within western Europe (in particular), against not only the legacy of the decadence of an imperial Rome, but also the feudal institutions of landed aristocracy and financier oligarchies such as the financier aristocracy of Venice. As the formerly powerful landed aristocracies either evaporated, or were assimilated into the ranks of the financier oligarchy as such, the tradition of the Roman Empire and its notions of law, are expressed in the form of domination of society by a rentier-financier, “liberal” oligarchy of the Venetian type.<sup>14</sup> This oligarchy continues to be the essential politi-

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*One never really knows science, especially the mathematical side of physical science, until one has come face to face with the fact that the great fights within modern European science have all been essentially political, and that in the most literal sense of the term “politics.”*

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cally dirty opposition to Christian principles of both equality and the natural law of the general welfare, within the history of extended modern European civilization still today.

From the time of the Golden Renaissance itself, the struggle between the forces of republicanism and oligarchism has assumed the form of a conflict between the Classical Greek heritage of the republican, Christian currents of law, philosophy, and art, against the Roman imperial tradition adopted as the legacy preferred by the oligarchical faction. Hence, during the Eighteenth Century, the fight was between the Classical heritage, modelled upon the Greek of Plato, and the oligarch’s insistence upon the model of the Roman Empire and its law. Thus, from the time of Dryden and Pope in England, and Rameau and Voltaire in France, the essential political division in western European politics and culture was the war between the Classical and the Romantic. This continued into the late Nineteenth Century, and beyond, as typified by the Classical tradition of Bach, Mozart, and Beethoven, in musical compo-

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14. “Liberal,” as the term is defined by both the British monarchy of George I and Walpole, or the “French Enlightenment,” means not only a synonym for immorality, but, often, a principled commitment to immorality, as characteristic of the noble families of Venice, or that Venetian quality of immorality per se, which was expressed so typically by Hobbes, Locke, Mandeville, François Quesnay, Adam Smith, Jeremy Bentham, et al. According to the Venetian-British doctrine of liberalism, “immorality” is “human nature,” and everything, and everybody, is for sale, preferably at the cheapest price.

sition, still practiced by Johannes Brahms after the death of such leading European opponents of the Classical method of Bach et al. as Liszt and Wagner.

Ultimately, the Renaissance succeeded in some respects, if only partially.

The modern nation-state's influence succeeded, between the 1848-1849 collapse of Metternich's Holy Alliance and with Lenin's 1917 revolution in Russia, in bringing about the fall of the power of the European feudal landed aristocracies. Nonetheless, the Venetian "liberal" model of financier oligarchy, as expressed by the British monarchy and today's Wall Street gang, remains the leading opponent of the Renaissance, and has even gained greatly in its relative power since the untimely death of U.S. President Franklin Roosevelt, at the close of the 1939-1945 wars.

It is the continued existence of that British monarchy, which represents the leadership of the combined dirty power of a new imperial Venice. This new imperial Venice is centered in the monarchy's control over the British Commonwealth, and its virtual control over Commonwealth vassals such as the U.S. Wall Street gang. That Commonwealth, combined with its vassals, is the principal, continued dirty menace to humanity to the present moment. Until that oligarchical menace is removed from this planet, the danger of a new dark age resulting from the self-induced collapse of a civilization

still ruled by such an empire, remains the principal evil against which all mankind must contend.

To understand the issues of science and society today, and how they developed, situate modern world history against that background.

Since the time of the Crusades, most emphatically the Fourth Crusade, the financier oligarchy centered in pre-Eighteenth-Century Venice has been the principal internal adversary of extended European civilization. It was in this continued feudal-reactionary role of "liberal" Venice, that Padua's Pietro Pomponazzi revived the Byzantine Aristotle associated with the name of Averroës, as the rallying-point against the Fifteenth-Century Golden Renaissance. It was in furtherance of that same reactionary interest, as a corrosive influence against the legacy of the Renaissance, that Venice's Paolo Sarpi launched the neo-Ockhamite hoax which became known as British empiricism, and that Sarpi's most notable political heir, Abbot Antonio Conti, organized the Eighteenth-Century "Enlightenment."

I have defined the political nature of the resulting conflict over principle within science within *The Road to Recovery*. I summarize the most relevant portions of that account now.

As I have emphasized repeatedly in all the recent decades of my writing on related matters: The most crucial of the relevant facts to be considered, is that the most notable im-

## For further reading

*The following bibliography provides extensive documentary and analytical material on topics that are covered in Mr. LaRouche's article, in approximately the order in which they are discussed. See the end of this box for information on how to order.*



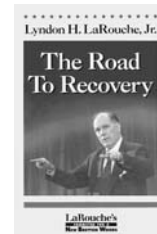
"The Eurasian-Land-Bridge: The 'New Silk Road' — Locomotive for Worldwide Economic Development," *EIR Special Report*, January 1997, 289 pages, **\$200**.



"The Russia-China Partnership: Good News for Human Survival," *EIR*, March 12, 1999. A report on Chinese Prime Minister Zhu Rongji's visit to Moscow in February 1999, and the emergence of the "Survivors' Club" of Eurasian nations. **\$10**.

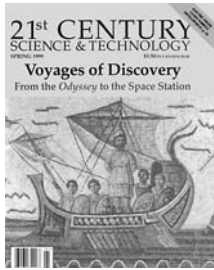


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“Voyages of Discovery,” *21st Century Science & Technology*, Spring 1999, \$5. Articles by LaRouche and associates on the history and methodology of ancient astronavigation.

Dino de Paoli, “Carnot’s Grand Strategy for Political Victory,” *EIR*, Sept. 20, 1996. See also LaRouche, “How France’s Greatest Military Hero Became a Prussian Lieutenant-General,” *EIR*, Oct. 2, 1998; and Elisabeth Hellenbroich et al., “Lazare Carnot: the Excellence of Leadership in Times of Crisis,” Jan. 8, 1999. \$10 per issue.



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

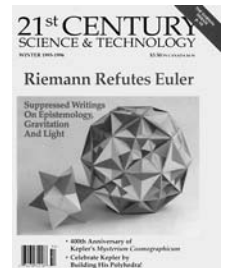
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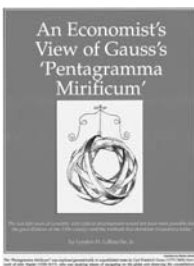
Lyndon H. LaRouche, Jr., “How Cauchy Ruined France,” and Pierre Beaudry, “The Bourbon Conspiracy that Wrecked France’s Ecole Polytechnique,” *EIR*, June 20, 1997, \$10.



Lyndon H. LaRouche, Jr., “Intelligence Policy: Truthful, or Merely ‘Factual’?” *EIR*, Jan. 9, 1998. Includes extensive discussion of Gauss, Kepler, and the issue of non-constant curvature. \$10.



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provement in the demographic characteristics of the human population as a whole occurred as a radiated effect of a social revolution known as Europe's Fifteenth-Century "Golden" Renaissance, a social and political revolution centered in the great ecumenical Council of Florence.

This Renaissance spawned the development of a new form of European national state, appearing first as Louis XI's France, then Henry VII's England. Such was the Platonic Renaissance echoed, if but briefly, around the personality of Isabella I of Spain. Although, to the present day, this revolution has never been world-hegemonic, even within Europe, certainly not in England or Spain since the early Sixteenth Century, the radiated effects of this development, radiated throughout the planet, have been the principal source of all the demographic improvements in the condition of humanity considered as a whole since the end of Europe's Fourteenth Century.

However, the failure of this Renaissance faction, after the betrayal and defeat of the League of Cambrai, to consolidate the establishment of true sovereign nation-states within Europe itself, led the European republicans adopting the Platonic Greek Classical precedent, to seek to establish the first true republics in the Americas. The first success accomplished by these Europeans was the establishment of the U.S.A., the only such state yet to exist whose political constitution (the combined Declaration of Independence and 1789 Constitution) are actually consistent with the principles of the Golden Renaissance.

To summarize the most relevant among the historical facts elaborated in such earlier locations as my *The Road to Recovery*: There are three most important causal features among those serving as the driving force of political culture behind the general trend of improvement of the demographic characteristics of the world's population: an improvement which continued, with some relatively brief interruptions, until the reverse, downward, so-called "post-industrial" trend, established inside the U.S.A. and world-wide, during the interval 1971-1981.

1. The introduction of the notion of the *general welfare* of the people and their posterity as a whole, as a notion of natural law binding upon nations. This principle of natural law was first established as a principle of government by the reform introduced as policy by France's Louis XI. This is the same Leibnizian, anti-Locke principle of natural law featured within the U.S. Declaration of Independence, and defined as the fundamental constitutional law of the republic by the Preamble of the 1789 U.S. Constitution.

The relatively spectacular improvement in the national income of France, under Louis XI, illustrates the introduction of this new, same principle of natural law as the basis for defining the authority and function of the sovereign nation-

state. The recovery of England under Henry VII, done in imitation of Louis XI's role in France, illustrates the same point. Again: The case of the policies of Spain's Isabella I, despite the contrary policies of the Spanish Hapsburgs who followed her, is also notable.

2. The principle of universal scientific and technological progress through individuals' validatable discoveries of universal physical and other principles, and of the fostering of educational policies to match this imperative.

In Plato, this is the principle of knowable truth, also the principle of justice. As the passion known as *agapē*, this passion for truth and justice is the principle of Christianity upon which the Apostle Paul places such famous emphasis in his *I Corinthians* 13. This is also the fundamental difference between man and beast, expressing the Christian notion of that ecumenical principle of Moses, that each man and woman is made in the image of the Creator, thus set apart from, and above the beasts. This is the principle from which the Golden Renaissance was derived, and with it, the notion of the sovereign nation-state, which exists to serve the general welfare, rather than some particular ruling personality, social class, or other special social stratum.

3. Derived from this second principle, is the third: the universal principle of endless progress in the condition of human life, per capita and per square kilometer, emphasizing changes in behavior and culture corresponding to the imperative of unending scientific and technological progress.

As the relevant writings of Leonardo da Vinci and Machiavelli illustrate the awareness of such connections at those earlier points in modern history, the realization of reforms consistent with Louis XI's strategy of statecraft, invested nations committed to the three referenced new policies with an inhering strategic superiority, in arms and otherwise, over societies adhering to the feudal and earlier tradition of degrading most of the subject population to the condition of illiterate virtual or actual human cattle.

On this account, despite the ability of the European financier-oligarchical and landed-aristocratic classes to prevent nation-state republics like that of the U.S.A. from being established in Europe, economic-strategic military and related realities forced even the oligarchical classes to tolerate progress, however reluctantly otherwise, as the price of avoiding otherwise certain defeat by relatively more progressive forms of society.

Thus, the ideas of progress spread from Europe and the Americas into those regions of the world which were otherwise the most backward, or brutally subjugated. The idea of progress became a powerful political force globally, even

within nations whose rulers would have passionately preferred that doctrine of perpetual backwardness which Byzantium and western European feudalism inherited from the Code of the Roman Emperor Diocletian.

It is to be emphasized, that the root of these three principles of the modern European political philosophy associated with the rise of the modern sovereign nation-states, such as the U.S.A. defined by its Leibnizian Declaration of Independence and Constitution, is the notion that each man or woman is made in the image of the Creator of the universe, and thus, each, with the potential for creative discoveries of universal principle—in contrast to the lower forms of life, such as the gaggle of great apes which the British monarchy claims to be. The relationship between mankind and the universe, so defined according to the three leading principles associated with the Golden Renaissance, represents natural law, an authority higher than any customary or positive law.

That issue of law, the issue of natural law, so defined, in opposition to the intrinsic irrationalism of positive and customary law, is the fundamental strategic issue of the history of modern civilization. It is also the source of the fundamental principle underlying successful practice of science and economy.

Now, focus upon the present, perilous strategic situation of the world as a whole. Consider the current situation, as it has developed over the course of the presently passing century, in light of the preceding summary of modern European history as a whole.

### **The historic choice before us**

The London-centered forces had exploited the death of U.S. President Franklin Roosevelt, to create a strategic conflict with the Soviet Union, which they orchestrated, in order to forestall and reverse Roosevelt's intent to eradicate the legacies of both "free trade" and colonialism. Once that choice was made, through aid of the totally unjustified dropping of the two nuclear bombs on Japan, the Anglo-U.S.A. versus Soviet conflict shaped the entire sweep of world history over the 1946-1989 interval, and even beyond.

Under those conditions, as long as the Soviet Union existed as a viable superpower, the financier oligarchy dominating the policy-shaping institutions of the U.S.A., the British Commonwealth, and western continental Europe, was obliged, that *by the contending powers' own willful choice of perceived strategic necessity*, to maintain and defend the quality of strategic potential which is unique to the modern sovereign nation-state and its form of economy. In their view, this choice was imposed upon them by their own commitment to maintaining the global conflict in that form. They made the choice, despite their hatred of the very nation-state system of economy upon which they were forced to rely.

From the beginning of the Twentieth Century, the British Empire's policy had been: 1) To recapture hegemonic political control over the U.S.A. and its economy, with a view to

reassimilating the U.S.A. itself into the British Empire; 2) To destroy those nations of continental Europe which had been greatly increasing in economic and strategic power through their adoption of leading features of the 1861-1876 U.S. model of modern industrial nation-state economy; 3) To follow the war intended to accomplish the stepwise, mutual destruction of the continental European nations, with radically utopian measures intended to establish a British monarchy-dominated system of world government.

It was their intent, that under their rule, the institutions of the sovereign nation-state and American model of modern agro-industrial economy would be eliminated from the planet. The spread of the hoax called "ecologism," by the utopians such as those of Bertrand Russell's circles, was an integral part of this intent to destroy civilization in its present form. As Russell had indicated, in his own typically perverse way of doing things, toward the close of the 1920s, his intent was to bring scientific progress to a halt, a measure reflecting his and his crony Wells' passion for eradicating that science-driven modern agro-industrial nation-state system which they hated with such perverse passion.<sup>15</sup>

From the time of influential novelist H.G. Wells' 1913 proposal for the development and use of nuclear-fission weapons, as an instrument to terrify the world into submitting to world government, Wells' outlook continued to be the long-range strategy of a powerful, utopian faction within the British oligarchy, a faction, including relevant nuclear-weapons scientists Eugene Wigner and Leo Szilard, which came to be centered around Wells and Bertrand Russell. Russell's success in inducing the U.S. to develop the nuclear weapons which Britain could not have developed alone, has shaped the history of the planet ever since.

The 1962 Cuba Missiles Crisis turned out to be a partial success for the utopians, bringing about changes in policy which followed the Wells-Russell doctrine for the political aims of nuclear weapons. During the course of the post-1962 1960s, traditionalist types of leaders were purged from the most powerful governmental positions, in one way or another. Wall Street types such as disarmament specialist John J. McCloy carried the hod for the British monarchy, in fostering social and economic policies designed to lead the world toward a post-industrial utopian order. This utopian trend of institutional change, was set into motion during the 1964-1972 interval.

The most crucial success of these utopians came with the unravelling of the Soviet Union over the 1989-1991 interval. Under the leadership of Her Majesty's Thatcher government, abetted by both Britain's agent of influence François ("Napoleon IV") Mitterrand, and the complicity of the Wall Street

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15. H.G. Wells, *The Open Conspiracy: Blueprints for a World Revolution* (London: Victor Gollancz, 1928). This was the doctrine to which Russell publicly subscribed at the time, the utopian policy he and Wells, and their followers, have pursued ever since.

crowd behind U.S. President George Bush, a set of measures was shoved down the throats of both the former Warsaw Pact powers and western continental Europe, measures intended to destroy the economies of both the former Warsaw Pact region, and western continental Europe, too.

Now, these measures have nearly succeeded—in bringing us to the threatened brink of “World War III.” The world is now imperilled by threat of global doomsday warfare fought in all conceivable expressions. This would include use of nuclear weapons by leading nuclear powers, but under conditions roughly analogous to the evolution of Europe’s 1618-1648 Thirty Years War. These would degenerate rapidly into wars that run on, and on, without visible end-point, wars which everyone fights, but, despite playboy Secretary of Defense William Cohen and meatball Chairman of the Joint Chiefs Henry Hugh Shelton, no nation is capable of actually winning.

Those utopian policies which the British monarchy and its U.S. accomplices had set fully into motion beginning the aftermath of the 1962 missile crisis, were dismembering the nation-state economies of western Europe, the British monarchy’s Commonwealth in general, the Americas, and elsewhere. The willful collapse of physical output, per capita and per square kilometer, in western Europe, the Americas, and some other parts of the world, had produced the post-1971, cancerous growth of a monstrous financial-speculative bubble of “floating exchange-rates,” a bubble dependent upon the systematic and systemic destruction of the physical-economic basis on which the cancerously, parasitically expanding financial bubble reposed.

With the success of the Thatcher-Mitterrand-Bush role of 1989-1991, in unleashing a spiral of self-destruction and looting of the economies of continental Europe, and also a systemic erosion of the economy of the Americas, by 1997 the world taken as a whole had been brought into the collapse-phase of any economy enslaved to the perpetuation of the existing world financial system. The fact that the post-October 1997 condition of that financial system had entered a phase of terminal collapse, became manifest through the collapse of the New York-based hedge-fund empire of LTCM, during mid-August through mid-September 1998.

The response to the resulting financial developments of the August 17-October 15, 1998 interval, by the British monarchy and its accomplices, was to shift toward aggressive warfare by the British monarchy and its U.S.A. agents, against not only then freshly targetted Russia and China, but also to bring down absolute ruin upon the vassal-like relics of the former sovereign states of the continent of Europe in general.

The intent to degrade the NATO members of continental Europe into mere vassals of the British Commonwealth’s London-centered power, was the clearly and repeatedly asserted doctrine, against the UNO Security Council, by Her Majesty’s Blair government. This was stated—against the UNO Security Council—in connection with the bombing of

Iraq. It was stated in the deployment of NATO into the subsequent Balkans war. It was underscored by the doctrine that NATO shall be deployed by the Her Majesty’s government and its U.S. satrap, against any part of the world against which Her Majesty’s enmity is currently, however whimsically, directed.

What erupted in the form of precedents to this effect, set against Iraq, during October-November 1998, has been the present, hysteria-driven drive toward a global, chain-reaction spread of warfare, war which now threatens to spread rapidly, in one form or another, around this planet as a whole.

War fought under such circumstances converges rapidly on doomsday warfare: wars fought without hope of victory, but fought nonetheless all the more savagely, if futilely, because no condition of peace is allowed by the British monarchy, under which the targetted nation could survive in any recognizable form. It is a war whose actual effect could only be to drive the planet, including the U.S.A. itself, into a state of prolonged barbarism.

### **The lunacy of ‘benchmarking’**

All of this utopians’ madness unfolds with a persisting, mounting expression of determination to eradicate science. This is conveniently illustrated by study of a recently popularized bit of corporate-industrial lunacy, called “benchmarking.” As I shall show here, this example has acute importance for appreciating the importance of the kind of Eurasian Land-Bridge cooperation I am supporting.

What is stunning about the current state of degeneration of the intellectual level of recent university graduates, is the lunatic perversity of the form in which the hatred against science is being expressed by most among them—and also by others. All real science is pushed aside for the pseudo-science of the so-called “information age.” This hoax, of substituting “the information age” for science, reflects the pathetic degree of science-illiteracy that has taken over the increasingly illiterate generations of the populations. This is the same sort of illiteracy permeating opinion among those leading figures of government, education, and business, representative of the so-called “Sixty-Eighter” and younger adult generations of today.

As I have stressed, once again, in this location, the essence of science is an accumulation of multiply-connected, validated discoveries of universal physical principle. This accumulation assumes the aggregate form of a Gauss-Riemann hypergeometry (“multiply-connected manifold”). The lunatic illiteracy of belief in “random numbers,” and of regarding “fractals” as non-linear functions, has been mustered as one of the sophistries to lure the susceptible into accepting the delusion, that there are no validatable physical principles in the universe, but only “truth-propositions” defined by the purely linear state of mind of the Russell-Whitehead *Principia Mathematica*.

For these poor, duped illiterates, nothing can be real unless

it is generated by the Internet.

A most appropriate illustration of the economic and social effects of the systemic delusions of the current “information age” cult, is the process of replacing the practice of unique experimental forms of proofs of physical designs, by reliance upon computer-based “benchmarking:” the use of linear computer modelling as a replacement for experimental methods of machine-tool design.

This intrinsically fatal sort of incompetence, “benchmarking,” is more easily understood when it is recognized as an outgrowth of both the introduction of “value engineering” during the 1950s, combined with the increasing cheapness, speed, and capacity of operations using modern computer apparatus. Despite the latter developments, the genetic quality of “benchmarking” today, is the same kind of result produced by a lunatic mis-mating of scientifically moronic financial accounting with “ivory-tower”-style “Operations Research,” back in the 1950s. The outcome of such an ill-bred union, could not have been a viable new economic species.

This evolutionary emergence of the doctrine of “benchmarking” also reflects the effects of powerful pressures for ever-greater emphasis upon so-called “out-sourcing,” pressures exerted from both governments and “free trade”-fanatical varieties of supranational agencies, and from the financial bandits behind the current maniacal waves of financial interests’ globalized “mergers and acquisitions.”

As Daimler-Benz’s recent great embarrassment, in the celebrated affair of the *Elch* scandal, illustrates the point, the use of “benchmarking” as a substitute for principles of experimental machine-tool design, must necessarily produce catastrophes, catastrophes which must often, and ever more frequently, produce preventible, fatal results of one kind or another.

The most deadly, combined economic effect, is ever greater, more risk-prone forms of incompetence in the design and production of products, and the even more deadly long-term effects of virtually eliminating the machine-tool-design sector from the economy. Such disastrous effects are predetermined as a matter of principle.

The classical scientific illustration of the nature of the incompetence underlying computerized “benchmarking,” is the nature and outcome of Kepler’s determination, that the orbit of Mars is elliptical, rather than circular. For this purpose, pick up the thread of a discussion of non-linearity, above.

The notion of the universe as organized according to a spherical principle of action, is very ancient, as reflected in known solar-astronomical calendars dating from as early as deep into the last ice age. For example, a solar orbital period of approximately 100,000 years, in addition to the Vedic equinoctial cycle of nearly 25,000 years. There were also cycles for the movements of the geodetic and magnetic North Pole. As has been noted by some among my associates, crucial evidence of spherical action is presented in a dramatic way,

by transoceanic navigation which passes from the domain of the northern to southern sky-map, and back.

In these and similar cases, the astronomer or navigator has normalized his observations to conform to the assumption of observed action ordered according to a metrical principle of constant curvature. To that trained, experienced ancient observer (or, a modern student who repeats the experiments), the determination of a regular cycle depends upon measurement ordered according to the principle of normalizing the observations for constant (i.e., spherical) curvature as the relevant principle of action.

Kepler’s discovery of the elliptical orbit of Mars, was therefore key to the most revolutionary discovery in all modern physical science. It was a shockingly crucial proof of Cusa’s principle of *docta ignorantia*, a crucial proof of the same argument, against *a priorism*, which Riemann was to summarize in his celebrated 1854 habilitation dissertation. It was Kepler’s discovery of a principle of non-constant curvature, which prompted Leibniz’s unique original discovery of a calculus based upon the principle of non-constant curvature, and which led to the defining of the Gauss-Riemann principle, of hypergeometries of ordered series of multiply-connected manifolds.

It is precisely that principle of multiply-connected manifolds, which is at issue, in warning against the currently popularized, lunatic fad of computer-assisted industrial benchmarking.

Consider the following steps immediately consequent upon Kepler’s work on the orbit of Mars.

## ‘The Elch scandal’

Daimler Benz constructed a tiny car, the A-Class, exclusively on the basis of computerized design and simulations, without any live testing. This car went into the first big testing runs in northern Sweden—where elks live, which is why it was called the “elk test.” The test is a simulation of the surprise encounter of a car with an elk. The driver either has to slam on the brakes, or swerve to avoid the “elk.” The A-Class failed the test, overturned, and landed flat on its roof—at speeds of only 40-70 kilometers per hour.

After the debacle, months were invested in reconstructing the car so that it would not end up flat on its roof, at every curvy maneuver. Daimler Benz was forced to resort to consulting actual engineers, to iron out the mistakes created by the virtual engineers. Since January 1998, the car has been on the market.

—Rainer Apel





*Bernard Riemann concludes his 1854 habilitation dissertation, "On the Hypotheses Which Lie at the Foundations of Geometry," with the following famous statement concerning aprioristic mathematical investigations: "This path leads out into the domain of another science, into the realm of physics, into which the nature of this present occasion forbids us to penetrate."*

1. The notion of a universal principle of constant curvature, had already guided Kepler to follow Plato in defining action within the solar system as ordered metrically according to the principle of construction which Gauss defines by the example of the *Pentagramma Mirificum*. On this account, Kepler located the available planetary orbits of the Solar system as expressing harmonic relations ordered in congruence with the Platonic solids. That view, that the principle of action in the universe is ordered by the metrical characteristics of physical space-time as a whole, Kepler never abandoned.
2. The Mars elliptical orbit posed a modified view of the Solar system. It was from this vantage-point that Kepler defined what are misreported as his "three laws." This meant, however, that the regularity of lawful Solar trajectories could not be defined within the bounds of simply constant curvature, but required a method for defining regular trajectories expressed in observable small intervals, trajectories corresponding to regular non-constant curvature.

3. The first approximation of a solution for this challenge, was provided by Leibniz's development of a calculus based upon the notion of regular non-constant curvature in observable "infinitesimally" small intervals of actions (e.g., "non-linear" intervals of action).
4. The form of general solution for dealing with phenomena in a universe of this type, is the notion of a hypergeometry of multiply-connected successive manifolds, of the Gauss-Riemann type. The first unique-experimental validation of this type of hypergeometry was Gauss' unique solution for determining the orbit of the asteroid Ceres.

The same principle of multiple-connectedness so typified for astrophysics, applies in every aspect of the physical domain. Every application of some array of principles, must consider not only the experimental validation of each presumed principle, but also the interconnected action among all of those particular principles (e.g., technologies) relevant to the action being studied. As Riemann stresses in the conclusion of his habilitation dissertation, the characteristic feature of such interconnectedness must be adduced experimentally, not by aprioristic mathematical fabrications.

For the kind of design problems posed by the example of the *Elch* scandal, the conventional, sane practice of German industry (for example), prior to the use of "benchmarking," would be to rely upon those principles of machine-tool design derived from the pioneering influence of France's Lazare Carnot.

The German machine-tool-design industry, the "spirit of the ship" underlying the former successes of Germany as an industrial export economy, is the model example of the development of the application of Carnot's principle. If we examine the successes of Germany's machine-tool-export sector—the sector on which Germany's role as the economy-driver of continental Europe as a whole has depended, we recognize the calamitous result which must occur if that sector of Germany's economy is more or less eliminated. The economy of not only Germany, but all of western and central continental Europe, must collapse into a relative new dark age. The combination of the post-1989 spread of "out-sourcing" with the growth of "benchmarking" practices during the same period, has pushed the German economy over the brink, in the direction which, unless reversed, will indeed plunge the economies of Germany and the rest of western and central Europe, into a new dark age.

From the standpoint of Riemann's habilitation dissertation, the following considerations are the most essentially relevant.

1. The machine-tool principle, as introduced by Lazare Carnot, expresses the basis for the design of proof-

of-principle experiments, including what Riemann defined as unique experiments. It is from the design of such unique and related experiments, that validated discoveries of universal physical principle generate those by-products known as new technologies.

2. It is the machine-tool principle, so understood, which is the only reliable test of the characteristic features of any design which involves a new kind of combination of previously defined physical principles and their related technologies.
3. By the nature of the physical principles involved, no digital computer's projection of the characteristics of some new combination of the principles expressed by technologies, can faithfully forewarn the manufacturer of the consequences of that design. Only a working experimental model, crafted according to strict principles of machine-tool or analogous design, can satisfy this requirement, as Riemann stresses this physical principle, against formal mathematics, in the conclusion of his habilitation dissertation.

Such issues, posed by the inherent fallacies of benchmarking, are crucial issues for the design of successful international collaboration around the Eurasian Land-Bridge program.

### Ending the nightmare

Before turning to our concluding topic here, the summary outline of the prospects for a coming revolution in science, consider the nature of the preconditions for launching the kind of cooperation around the Eurasian Land-Bridge which would bring such a scientific revolution on stage. Exactly what the political form of the solution for the present crisis might be, can not be predicted with any exactness, but the general nature of the preconditions for such a happy turn of events can be estimated with sufficient precision to satisfy our purposes in this present report.

As I have stated in other locations recently, the global disaster implicit in recent developments and present trends, can be averted only if some powerful force intervenes to bring to an abrupt end those policies presently leading the world toward a probable World War III, and the virtual certainty of a prolonged, planet-wide new dark age of humanity as a whole. The general rule is, that the present constellation of policy-shaping leads assuredly toward a planetary new dark age, and that soon. It is even likely that such a new dark age would appear as the correlative of a global spread of warfare and related homicidal chaos, more or less planet-wide.

Such a grim prospect for humanity, implicit in the current influence of the British monarchy's Blair government, can be

averted only by the intervention of a power greater than that combined political power presently led by Her Majesty's government. In short, a happy, peaceful solution can be obtained only through a concert of forces sufficient to impose a radical change from presently hegemonic policies. In fact, the only such potential force, is the combination of the President of the U.S.A.—President Clinton, to be specific, the current cooperative relationship among Russia, China, India, and others, and some representation from a leading nation of continental western Europe.

To master the situation, even to bring such a concert of action into being, requires two general preconditions. First, there must be a clear vision of the end of the present spiral of conflict, and, second, a clear understanding, among the forces required for this mission, of shared self-interest in achieving that common result.

The vision is implicit in a recollection of the late President Franklin Roosevelt's intent to establish a post-war just world economic order, an order freed from the legacies of "free trade" and colonialism. That is the road we should have travelled from 1945 onward; the road we followed, instead, has proven, predominantly, a disaster. We most choose a vision of peaceful cooperation among perfectly sovereign nation-states which is broadly consistent with the principles of a just world economic order proposed by Franklin Roosevelt then.

This design for a just, new world economic order must have a focal point, a strategic focus which looks ahead at least a generation or two. The needed focus is supplied by the Eurasian Land-Bridge, and by the image of the Eurasian cooperation already in early stages among a group of nations including China, Russia, and India. By virtue of the repercussions of the extension of such cooperation to effect natural participation of other parts of the planet, a general upsurge of the world economy can be assured for generations to come.

It is a clear foresight of the self-interested participation of the U.S.A., western Europe, and Eurasia generally in such a long-term development program, which provides the motivation for the joint action of relevant parties for the purpose of bringing the presently menacing state of affairs to an abrupt end.

The conclusion of this report focusses upon a crucial feature of such cooperation: the role of a scientific-revolution-in-progress as a naturally emerging feature and benefit of that cooperation around the Land-Bridge effort.

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## 4. Science and economy

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As I also emphasize in *The Road to Recovery*:

Under present world circumstances, it is virtually impossible for sane and competent persons to avoid repeating the crucial political point. The individual member of the human species is set apart from all lower forms of life, such as apes, by the developable cognitive potential of the individual hu-

man mind. This potential enables an individual, acting alone, to generate a validatable new universal physical principle, for example. Since the act of cognition occurs behind opaque screens of individual sovereignty, no person could know a validatable universal principle in any other way than that method of original, non-deductive cognition which is the unique, developable potential of the human individual.

Therefore, new principles, once discovered by one person, are made known to mankind more generally only through the repetition of the original cognitive act of discovery by other individuals, individually. That is the principle of what Wilhelm von Humboldt defined as Germany's program of Classical Humanist education. It is only by re-enacting such discoveries of universal principle, that those principles are known to persons other than the original discoverer. This principle of cognitive re-enactment is the only way in which we can assign the value of *truth* to any idea.<sup>16</sup>

Thus, what mankind is competent to identify as knowledge, is an accumulation of such re-enactments of sovereign cognitive rediscovery of principles passed down, by individuals' replication of such discoveries, over successive generations, even perhaps, in some part, millions of years. These so-accumulated, validatable universal principles, form what the mathematical physicists Gauss and Riemann defined as a *hypergeometry*, a *multiply-connected manifold*.

In the instance of what are recognized as universal physical principles, what is rightly recognized as the progress of *physical science* to date, forms such a manifold of principles. To the extent this accumulation of principles is actually known by an individual, that individual has replicated the act of original discovery of each principle by the method I have associated with a pedagogical unique experiment.

Thus, the rate of increase of the potential relative population-density of society, depends functionally on the right choice of forms of education supplied to the general population, and on the society's emphasis upon steering investments in infrastructure and modes of production and distribution of product, into directions which take advantage of the advances in knowledge of which the population in general has been made capable through education and complementary means.

Crucial is both the form and content of education. If the standard for education is merely learning, then the prospects for increasing the productivity of the population as a whole are relatively minimal. Only if the educational programs are universal in nature, and only if these programs correspond to

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16. Hence, empiricists, Kantians, and positivists, who deny the existence of such a knowable principle of cognition, deny the existence of knowable truth. This specific denial of the existence of truth, is the basis for the so-called moral philosophy and economics doctrine of England's Adam Smith. An honest empiricist, or Kantian, called to testify, must reply to the invitation to take the oath of testimony, by saying, "How could I swear? My philosophy assures me that I have not the slightest idea of what the truth is."

Classical Humanist forms, rather than the mere learning which is the standard for the U.S.A., Europe, etc. today, can any general, sustainable growth in productivity be gained. Without preference for investment in public works and means of physical production and distribution of product which drive productivity forward through willful emphasis upon scientific and technological progress, there can be no sustained growth of net productivity (after discounting for technological and related forms of attrition).

In short, the emphasis must be on shifting the notion of the way in which wealth is generated. We must reject the brutish misconception of wealth, as an epiphenomenon of the horny hand of labor, or, in the alternative, of the cupidity of the Wall Street scalawag, to emphasize the control over the hand of labor by those cultivated cognitive powers of the individual human mind, which we associate with Wilhelm von Humboldt's notion of Classical Humanist education.

However, we must not think of an education in physical science in narrow terms of reference. The manifold of true knowledge is not limited to what were more easily recognized as universal physical principles. Social practice depends upon the ability of society to coordinate action among the cognitive processes of discovery of several or many minds of persons acting in concert. Without conspiracy, in that sense, civilized society were not possible.

The science of such forms of conspiracy is known as the same principles of Classical artistic composition we associate with the heritage of Scopas and Praxiteles, the tragedies of Aeschylus and Sophocles, Shakespeare and Schiller, the dialogues of Plato, the science and art of Leonardo da Vinci, the compositions of Raphael Sanzio, and the Classical methods of musical composition which Mozart, Haydn, Beethoven, Brahms et al. developed on the foundations of J.S. Bach's crafting of well-tempered polyphony, on the foundations of Leonardo da Vinci's view of Florentine *bel canto* vocalization.

Thus, before there could be science, there had to have been art.

### **The principle of human relations**

As I stress within my *The Road to Recovery*, to define knowledge of cognition, we must focus attention initially upon an experience commonly shared among pupils in a setting which has become rare today, a competent school. Such is the condition, most notably, since those OECD proposals for reform of education expressed, for example, by the so-called "Brandt reforms" in Germany. We must focus on the preferred, if presently rare, model case, in which one pupil, who has successfully replicated, from history, an earlier original, validatable discovery of principle, now proposes that another student replicate that same experience.

For the purpose of our argument here, we must continue that case-study to past the point that the second pupil has

successfully replicated the same discovery, and the two pupils are now sharing the fruits of their combined experience in this matter.

If both these students were informed of the central thesis of Immanuel Kant's *Critiques*, as each looked thus into the mind of the other at that moment of shared cognitive discovery of a principle, both might have said, rather spontaneously, "Kant was wrong!" In fact, Kant was absurd, perversely motivated in defense of his delusion, his hysterically deranged, and cupidity-stained state of mind. Both students have gained the evidence to prove that fact. The case of Kant helps to put our crucial point into focus.

During the decades prior to the appearance of his *Critique of Pure Reason*, the wretched Immanuel Kant had been notorious as both a Leibniz-hater and a disciple of Britain's David Hume. Apparently abruptly, Kant professed he had distanced himself from a radical turn in Hume's own doctrine. In this connection, he associated himself with the anti-Leibniz faction of Maupertuis and Leonhard Euler at the Berlin Academy, where he appeared as a pro-Newton, pro-Romantic opponent of such notable, Classical-Greek advocates, as the pro-Leibniz, pro-Bach Gotthold Lessing and Moses Mendelssohn. After a solid intellectual thrashing by Moses Mendelssohn, Kant retired from public to sulk, until after Mendelssohn's last illnesses and death, at which point Kant discovered the insolence to present that series of fraudulent *Critiques* which launched the perversion known as "German Critical Philosophy."

In his *Critiques*, Kant presented himself as having shifted his premises from those of the contemporary neo-Ockhamite empiricists, to Aristotle. On close comparison of the relevant writings of Euler and Kant from this period of the Berlin Academy, it is clear that the core of Kant's newly adopted premises of that period of his writing, had been supplied by Euler's scientifically fraudulent attack on Leibniz's calculus and *Monadology*.

In effect, Kant's central argument is, that in such a case as the two students of our illustrative case, one student, looking into the mind of the other, sees nothing. For Kant, cognition, as expressed by the validatable, non-deductive synthesis of a newly discovered, or newly rediscovered universal physical principle, does not exist, or, if possibly existent, is not a knowable experience. It could thus be said of Kant, that, like Euler, and like most of those crippled by excessive addiction to mathematical formalism, he dreamed in black-and-white; for him, as for the pathetic Schelling and also Hegel, human flesh and color did not exist.

In the course of years of teaching economics, from consulting experience over a pair of decades, and, in related work, I encountered frequently this Kantian-like pervasiveness of related mental blocks among ostensibly well-educated professionals. At the close of the 1950s, for example, I found the work of Yale's Dr. Lawrence Kubie extremely relevant on

this account.<sup>17</sup>

Even among persons who have sometimes, in earlier periods of their life, shown exceptional gifts for validatable discoveries of principle in a cognitive way, they are rarely capable of looking into the mind of another to see a mirror of their own relevant cognitive processes. (Sometimes, one wonders if the problem is not, in part, the fact that they either know or suspect that they have something shameful there, which they are desperately determined to hide even from themselves.) Typically, on this account, I have seen frequently, as Kubie himself reports, that seemingly gifted young scientists lose their fruitfulness either during the period of gaining terminal degrees, or a bit later, and in their later professional careers. They turn creatively fallow and mentally blocked in even a pitifully pathetic degree. Indeed, such blocked, "Kantian-like" mental states, are the most common correlative of moral as well as intellectual failures in the behavior of otherwise cultivated and talented personalities.<sup>18</sup>

That contrast between what Kant denied to exist, and what those two students must be seeing in one another's mind at that instant, is key for knowing the way the science-driver stimulant supplied by the Eurasian Land-Bridge may foster a global revolution in science.

The additional point to be stressed, is the distinction between the individual's use of his or her cognitive powers, and his or her empirical consciousness of those powers as mental objects which one may recognize as active or numbed within the sovereign mental processes of another person. Although the creativity of the person who lacks such insight into his or her own thinking, may be real in respect to the usefulness of its product, the failure to apprehend that phenomenon as such, is the mark of the blocked personality, as to be distinguished from the presently rare occurrence of actually creative minds among today's putatively well-educated professionals. Although the two minds may each be expressing a fruitful form of the cognitive process, only the mind which perceives the phenomenon of cognition, is able to control its deployment in the same sense a true creative Classical artist or a truly creative scientific discoverer does.

The act of recognizing this set of facts and related problems bearing on the perception of the phenomenon of cognition, is the key to knowing where and how the great revolution

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17. Lawrence S. Kubie, *The Neurotic Distortion of the Creative Process* (New York: The Noonday Press, 1961; reprint of 1958 University of Kansas Press edition), and "The Fostering of Scientific Creativity," *Daedalus*, Spring 1962.

18. Never entrust a Kantian with command in a war or important battle. The exception, perhaps, is that racist pig, Field Marshall Montgomery, who contributed crucial efforts on behalf of Winston Churchill's London, to delay the victory in World War II six months or even a year longer than would have been the case under any of Britain's actually competent military commanders. To ensure the sabotage of any creative assignment, put a Kantian in charge of it.

in science, still before us, is to be found. The relevant argument is to be constructed as follows.

An example from musical performance is most apt at this point.

### Science and Classical art

Perhaps it is beyond dispute, that the conductor Wilhelm Furtwängler is, still today, the greatest orchestra conductor of this century. The crucial point of distinction is Furtwängler's emphasis on what is sometimes identified as "playing between the notes." Two recordings of his performances are sufficient for purposes of illustration: his conducting of Schubert's Ninth Symphony, as contrasted with the failed effort of Bruno Walter, for example, and the uniqueness, among performances on record, of his conducting of Brahms' Fourth Symphony.

The great Sanskrit philologist Panini would have recognized the point as involving the difference between the mentally healthy emphasis on the verb, and the pathological effect of stress on the noun. Gauss and Riemann would have recognized Furtwängler's argument (and its performance) as expressing the same deeper principle underlying the notion of a multiply-connected manifold.

Look at the musical score! Is music the performance of this printed score? Or, is the score itself, like any written text, merely a mnemonic device? Is the music not located between, rather than on the notes on the printed page? Does the music not lie, rather than on the notes, in the ironies of putting the notes together in a polyphonic fabric of the process of the presenting of that unfolding process, which is the composition as a whole? Those who present a Classical composition as a symbolic reading, are mentally ill, or suffering a kind of musical cretinism which no accumulation of musical professionalism could remedy.

If we must not violate the Classical composer's intent, as reflected in his choice of notes used as a mnemonic device, how must the composer's intended performance be read?

First, of course, one must hear the singing voice of J.S. Bach, singing in the same Florentine mode of *bel canto* vocalization which Bach's compositions themselves show conclusively, that he and Leonardo da Vinci shared. One must hear all voices, including instrumental ones, as *bel canto* singing voices, with the registral characteristics associated with the type of singing-voice part the composer has assigned them to sing at that place in the score. There must be clear polyphonic transparency throughout, aided by the careful shaping of each singing-voice part and the contrapuntal interplay of each part with all parts taken as a whole.

The key thing is the emphasis on the verb, as Panini would be pleased to agree. It is the developmental transitions within the contrapuntal unfolding of the composition, which must be recognized as the verb, as the expression of that principle of action which carries the entire composition, as a process of constant variation, from each moment to the next through-

out the entire composition, from beginning to end. It is the idea of this polyphonic ordering of those transitions, which must be delivered in the performance. To attempt to give a literal interpretation to the score itself, is to embalm it as a musical corpse were; to apply a symbolic interpretation, as the Romantics and others are wont to do, is not an interment of the idea, but its abortion prior to birth.

The principle is the same principle as that of Classical poetry, such as those little gems which are the short occasional poems of the younger Goethe. The principle is the principle of metaphor. This is the same principle of composition of tragedy used by Aeschylus and Sophocles, by the great successor of both, Shakespeare, by Lessing, and, above all, as Beethoven and Schubert recognized explicitly for music, by Schiller.

Compare Sophocles' *Antigone*. For the sake of upholding the law, a great injustice is perpetrated, a defense of the "rule of law" which brings the entire society into ruin. Compare this case to the treatment of the issues of law by Plato, in his *Republic*. Or compare the self-destruction of Zeus' Olympus, resulting from the attempt to force the Prometheus of *Prometheus Bound*, to submit to the principle of *raison d'état*. In each of these cases, including the dramatic dialogue on law in the *Republic*, the music is found "between the notes." The mind of the sensitive member of the audience, witnessing a good staging of the drama, is gripped by the eerie sense of a controlling *idea*—in the sense of Platonic ideas—which is impelling the application of the prevailing rule, toward the doom of the society foolishly following that rule.

In such cases, Classical artistic compositions express exactly the same principle of metaphor-driven creative cognition, which we encounter in the generation of the discovery of a validatable universal physical principle. The physicist in the footsteps of Kepler, Leibniz, Gauss, and Riemann would say, that rather than allowing ourselves to be deceived into looking only at the apparent internal logic of the system, we must consider the fact that the system itself is flawed, perhaps fatally, by a previously overlooked factor, an axiomatic quality of altered physical-space-time curvature, overlooked by the actors within the drama of doom itself. Thus, the resolution of Classical-artistic metaphor, as this occurs in great artistic compositions and their performances, expresses the same cognitive principle of resolution of metaphor, encountered in the case of all validatable discoveries of universal physical principle.

It is the ability to compose and perform works of art in which the minds of the performers and audiences are directed inward upon their own cognitive powers, to recognize there such Platonic forms of ideas, which marks, alike, the special quality of the great creative Classical artist, such as a Schiller, Beethoven or Brahms, or Furtwängler, and the creative scientific thinker, such as a Leonardo, Kepler, Leibniz, Gauss, or Riemann. The genius of a Beethoven, in particular lies in emphasis on the change in physical-space-time curvature ex-

pressed by the composition as a whole, as expressed by emphasis on the “verbs” of the composition as the content of the process of composition as a whole: as the contrast between Furtwängler’s and Walter’s conducting of Schubert’s Ninth Symphony illustrates the nature of this kind of difference.

Focus upon the case of the two students from this vantage-point. In the light of the immediately preceding discussion of cognitive creativity, what is the question implicitly posed to each of the two students? The students are confronted by the same kind of challenge posed by the effort to discover the shaping of a musical performance which lies “between the notes” of a Classical musical composition’s score.

“Shaping” is the most appropriate metaphor for both cases. It is shaping the articulation of the performance, under the direction of a Furtwängler, which brings Schubert’s Ninth to life. This is the same as the meaning of “shaping” in referring to the change in characteristic curvature of physical space-time, as caused by the effect of adding the correction of a validated new universal physical principle, to the flawed preceding manifold.

This metaphorical notion of “shape” and “shaping,” as shared between Classical artistic composition and the discovery of universal physical principles, is key for understanding the nature of the fallacy inhering in the aprioristic presumptions of the empiricists, Cartesians, Kantians, and positivists.

### **Kant’s ‘Flat-Earth’ people**

The characteristic pathological feature of the empiricist and related reductionist views, is that the existence of a “shaping” of physical space-time is denied. On this account, they are all rightly classed together with the “Flat Earth” tribalists. In other words, from the standpoint of the two students sharing parallel experience of the cognitive generation of the same solution-idea, the Kantians, for example, are but a variety, perhaps a “nationality” among the broader assortment of “Flat Earth” tribes in general.

The source of this pathological, “Flat Earth” effect, should be obvious from the preceding discussion here. The notion that the explanation of the connection between two sense-phenomena, must not introduce any notion of physical-space-time curvature to the action connecting the production of those two appearances, is the one and only source of the kind of religious blind faith in linearity expressed by Galileo’s, Descartes’, and Kant’s notion of the aprioristic structure (geometry) underlying any physical-space-time manifold.

Yet, any two students who have repeatedly shared the parallel experiencing of the cognitive discovery of validated universal principles, know that the connection between the notion of the phenomenon of “rock” and the functional notion of “ore,” involves mental action (cognitive experience) of an attributably definite sense of “shaping” action. So, any gifted creator of a Classical composition, or performing artist delivering that composition to an audience, recognizes the role of that “shaping” action of the “light turning on in the mind,”

in governing the process of the finished composition, in an essentially unbroken way, from beginning to close.

Thus, we have knowledge that the transformation of our knowledge of the universe, from one state to another, is the product of a quality of non-deductive “shaping” actions, a *repeatable* transformation performed by the cognitive action of the individual mind. The question posed thus, is: “What is the relationship between the shaping action through which the mind generates such a succession of validatable notions of universal principle, and the form of action by means of which the universe generates the effect which our minds have thus discovered?”

The answer lies in the domain of the science of physical economy.

The unique-experimental proof of a functional quality of correspondence between such cognitive “shaping” of universal physical ideas, and the shaping of the connection between two successive phenomena in the domain of sense-perception, is the manifest increase of man’s power in and over the universe, mankind’s increased potential relative population-density, per capita and per square kilometer of the Earth’s surface, through what we identify generally as scientific and technological progress. The entire evidence bearing upon the development of the existence of the human species, shows that the universe is so designed, that it is obliged to submit to the will of mankind, whenever mankind acts upon the basis of a truthful discovery of universal principle.

Thus, the so-called observer is confronted by a choice. Shall we assume that the universe is ordered according to linear connections among mere phenomena; or, shall we understand the universe from the vantage-point of those practical means through which the universe is obliged to submit to the developable cognitive potential, inhering within the mind of the individual person? Shall we be ruled by our senses, or by Reason? The universe shows us, that it is ruled by Reason.

If we accept the rule of Reason, this poses a new set of practical problems to us.

The evidence of Reason is that truth does not, and could not lie within the bounds of any literate, or so-called “customary” use of language. On this account, the comparison of the legacies of the language-cultures of China, India, and western European branches, leads us to the foundations for a revolution in the teaching and practice of science.

Any language, at its literal best, must be read as a qualified musician reads a Mozart, Beethoven, or Brahms score. The idea does not lie in the words, the syntax, or the notes. The serious ideas associated with the use of any language, have their meaning within the functions of the cognitive processes of the individual mind, rather than the anal obsessions of the obsessive grammarian. The fact that western European dialects, the Vedic-Sanskrit, and Chinese, use language either in somewhat different ways, or against a background of differing cultural legacies otherwise, ought to impel us to find a common language of cognitive thought, as that which ought

to underlie the differences in the composition of the language itself.

Thus, without overlooking the similar cases for African languages, and others, we must regard certain forms of global collaboration among the respectively sovereign nation-states of China, the U.S.A., western Europe, Russia, India, and so on, as one of the greatest opportunities for the general improvement of the intellectual and moral condition of mankind as a whole. While this improvement bears upon principles of artistic composition, the most critical domain for immediate

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*The urgency of such a science-driver approach to development of Asia (in particular), is underscored by the presently crippling underdevelopment of the inland regions of China, the wasted land-areas of Central Asia, and the global urgency of conquering the Arctic region of Russia.*

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action is the need for a science-driver approach to the collaboration between the modern machine-tool-based cultures of Europe and the Americas and the machine-tool-poor, relatively vast populations and undeveloped territories of Asia. Although vastly increased exports of machine-tool-design-grade technology into Asia are an important, essential part of the prospective collaboration, more crucial is the development of the internal science-driver development, of a richly elaborated machine-tool-design capability within these latter regions.

That brings us to the crucial point of this present report.

Not only must China, India, and other nations lead in internal development of their own science-driver and machine-tool-design-grade programs of development, but this can not succeed without considering the impact of this upon the population generally, especially the large portion of the population which is living under poor conditions, or even severely illiterate. This signifies the need for a mode of Classical-Humanist form of education, which can meet the challenge of such a program of rising productive powers of labor, but a program which is aimed directly at fostering the relative rapid development of cultivated cognitive powers within these populations, an educational tactic which must take into account the cultural specificities involved.

The urgency of such a science-driver approach to development of Asia (in particular), is underscored by the presently crippling underdevelopment of the inland regions of China,

the wasted land-areas of Central Asia, and the global urgency of conquering the Arctic region of Russia.

If we are sane, we recognize that the current utopian efforts to replace the institution of the sovereign nation-state by some globalized form of "world government," is another fools' effort to build a Tower of Babel. Rather than attempting to "melt down" the variety of cultural currents of which mankind is composed, emphasis must be placed on a different approach to the issues of uses of language. Using the goad of the now-pressing need for scientific and technological progress as the prompting consideration, let us focus attention on the common language of the cognitive powers of mind, immediately those aspects of cognition which bear upon the deliberate use of directed cognitive development, to bring each branch of language-culture out of the intellectual wilderness, where reductionist mathematics and kindred disorders have generally reigned up to now.

If we recognize that the challenge of the Eurasian Land-Bridge (and its global implications) demand such an approach to the universal fostering of Classical-humanist methods of education for all young persons throughout this planet, we shall open our hearts and minds accordingly, using this goad to impel us toward what Dr. Edward Teller so elegantly and amiably termed "the common aims of mankind," back in Autumn 1982.

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## Epilogue

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So, in review and summation:

The application of the cognitive principle of discovery to adducing universal principles properly governing the coordinated efforts of separate individual minds, forms the body of knowledge rightly associated with the name of principles of Classical artistic composition. As I have just emphasized again, above, the term "Classical" is restricted in significance to Classical Greek, or equivalent examples, including Scopas' and Praxiteles' overcoming the crudeness of archaic Greek and Egyptian sculpture, the Classical tragedies of Aeschylus, Sophocles, Shakespeare, and Schiller, or the way in which Wolfgang Mozart devised the principle of Classical motivic thorough-composition on the basis of J.S. Bach's revolutionary development of well-tempered polyphony, on the foundation of Florentine *bel canto* vocalization.

What is properly signified by "civilized behavior," is the influence of the Classical principles of artistic composition and insight upon the ordering of social relations. This includes, for example, the notion of civilized law, as Plato's *Republic* defines the issues of natural law, in opposition to arbitrary (i.e., merely positive) and customary law.

In Plato, the principles of knowledge upon which knowledge of natural law may be adduced, are shown to be within the reach of the natural powers of a slave-boy's ability to work through a validatable discovery of a scientific principle. The

principle upon which modern European civilization was founded, in opposition to the legacies of the Roman imperial, feudal, and financier-oligarchical systems, is twofold: a) That no group of people can be degraded to the status of actually or virtually human cattle; and b) that, since all persons are capable of knowing the natural law, provided they are suitably educated in the use of their creative cognitive powers, all persons so educated are capable of participation in self-government of nations.

It is appropriate to conclude the argument here with a relevant political observation.

I emphasize again, that it had been the intent of U.S. President Franklin Roosevelt, an intent in accord with such natural law and U.S. constitutional tradition, to use the U.S. victory in World War II, to eradicate both the British system of "free trade" and the matching relics of Portuguese, Dutch, British, and French colonialism from the world as a whole.

The greatest single contributing factor in all the misery visited upon the planet since 1945, has flowed from the all-too-successful opposition of the British monarchy, and others, to Roosevelt's policy. The blame begins with those scoundrels who used the death of Roosevelt, as the opportunity for the British to recapture control of U.S. foreign and economic policies to such a large degree, that, during the new phase of *dé-tente* negotiations following the 1962 Cuba Missile Crisis, the

British and their Wall Street-centered U.S. assets, were able to make the U.S.A., to a large degree, a virtual puppet of British interest: a "combining of U.S. brawn with British brains."

The goal of this corruption of the decades since 1945, has been to assimilate the controlling establishment of the U.S.A. so fully into the British monarchy's imperial Commonwealth organization, that that monarchy's London, aided by its U.S. flunky, would establish a Roman-style world empire over the entire planet, striking down mercilessly, as the British monarchy's Blair government now proposes, any person or nationality which might resist such subjugation.

In short, that monarchy's imperial oligarchy acts as a class of oligarchs and their privileged lackeys, who assume the power of life and death over a mass of the world's population degraded to the virtual, or even actual status of human cattle. This oligarchy, at its mere whim, decides who shall live, who shall die, and what the conditions of life shall be.

These exemplary political issues are the core political issues of science itself. In this way, it should be clear that science so viewed, is the essence of politics. In the end, the fundamental issue of society, as of science, is the issue of the nature of the human individual, is the nature of that principle of cognition by which the validatable ideas of a single individual can live and reign in the universe forever after. That is the principle to govern the kind of world we must fight to build.

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