# II. A Dialogue of Civilizations

NOVEMBER 11, 1985

# LaRouche Writes to A Leading Chinese Scientist

*Lyndon H. LaRouche's 1985 letter below, published here for the first time, is only one of several exchanged between the late economist Lyndon LaRouche and the late eminent Chinese space scientist Zuwei Huang. Dr. Huang was in the Space Systems Research Department of the Chinese Ministry of Aerospace Industry. He wrote extensively on issues of space launch and missile defense, and was a frequent participant at international space conferences. Unfortunately, all the other correspondence between Dr. Huang and Mr. LaRouche appears to have been lost, including Dr. Huang's letters to which Mr. LaRouche was replying in this instance. Nonetheless, LaRouche's letter speaks for itself, as the reader will discover.*

Fusion Energy Foundation
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Zuwei Huang
Beijing Institute of Space Systems Engineering
P.O. Box 9208
Beijing, China

SUBJECT: Yours: June 27, Aug. 29, 1985
Sylvia Brewda: July 20, 1985

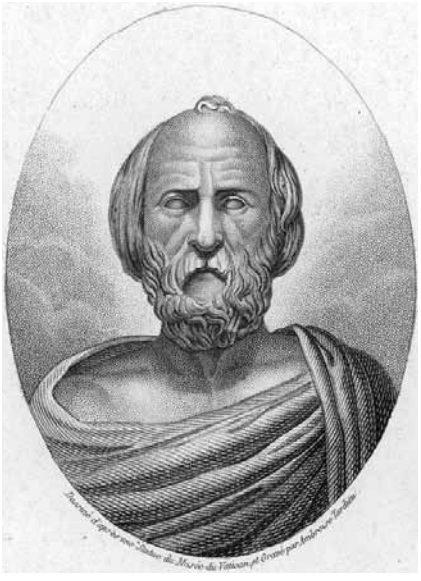
Dear Zuwei Huang:

Mrs. Brewda has suggested that I should forward you comment on the matters you have identified in the indicated correspondence. I do not think it scientific honesty, merely to identify the formulations defining the beneficial impact of military and space science upon the entire economy. The important thing is to identify to you and your colleagues the means by which you may judge for yourselves whether these are the correct formulations, or not. Therefore, the dominant features of this letter will be different than you might have anticipated, but I believe that I am replying in a manner which will be more useful to you.

The context for discussion of national economic policies of military and space research, is, of course, the present outgrowths of a western european scientific development which dates from approximately 1439-1440 A.D. Although the foundations of modern european science's development are to be traced meaningfully to classical Greece and Egypt approximately 2,500 years ago, Europe's dominant role in international science dates from revolutionary developments of the Italy-centered Golden Renaissance. To account for the revolutionary developments during the Golden Renaissance, the work of Plato, Archimedes, St. Augustine, and Charlemagne's reforms, must be taken into account; but, until the revolutionary contributions of Cardinal Nicholas of Cusa, Leonardo da Vinci, and their collaborators during the Golden Renaissance, there existed no physical science in the sense we know it today.

Hence, at the same time that India, China, Japan, and so forth, have mastered modern physical science, this has occurred as a greater or lesser degree of assimilation of the european culture in which modern physical science was developed. Although the cultures and religions of the various regions and sub-regions of Asia, for example, vary greatly among themselves, and vary in the nature of their coincidences and differences with european culture, the common fact of the matter is that the development of physical science among Asian nations (for example), and more emphatically, the social impact of technological progress, involves a sometimes difficult interaction between Asian cultures and the european-cultural concomitants of modern physical science.

In practice, this matter of the cultural impact of modern technology is made more complicated by widespread acceptance of a false view of "european culture." If the words, "european culture," are used to signify a kind of average of the cultural and political impact of Europe's past several hundred years of relations with Asia, a profound error of great practical significance is committed. The culture of Europe and the Americas is the product of a conflict of two philosophically opposite, and essentially irreconcilable currents within Europe and the Americas as a whole, a division which continues to exist within each nation of western Europe and the Americas, as well as a general cultural conflict within Europe and the Americas taken as a whole.

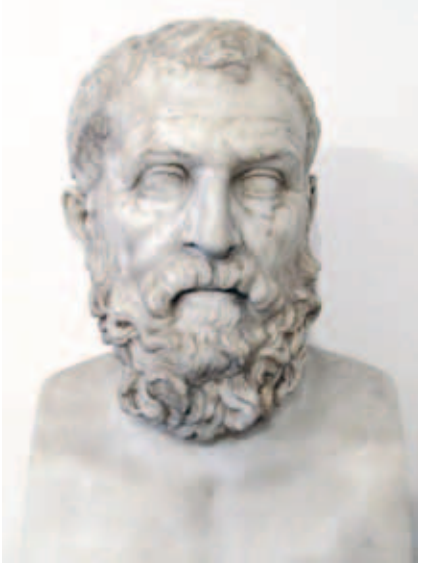


*Lycurgus of Sparta. An engraving by Ambroise Tardieu of a statue in the Vatican Museum.*

For example, the weightiest impact of Europe and the Americas upon Asia since the seventeenth century has been supplied by the Society of Jesus and the Portuguese, Dutch, and British Levant Company and its East India Company off-shoots. The deepest impact of the U.S. upon China during the nineteenth century, for example, was made by Boston-centered families operating as partners of the British East India Company in the opium trade: the families constituting the so-called "Eastern Establishment" and its San Francisco (Bohemian Grove) offshoot today: The Lowells, Cabots, Lodges, Higginsons, Perkinses, Peabodys, Russells, Morgans, Harrimans, and so forth. For simplification, I forward a copy of the first edition (New York, 1984) of Anton Chaitkin's *Treason in America*; an enlarged second edition, with extensive notes, is in the process of printing now, but copies are not yet available.

These families were partners of the British East India Company and Barings Bank, centered around the traitor Aaron Burr, who were involved in open treason in events of 1796, 1800, 1804, 1807, 1812-1814, and later. Today, the Anglo-American-Swiss-Venetian complex of international finance, of which these rentier-financier families of the U.S.A. are but a shareholder, is the dominant political force in the U.S.A., controlling the State Department, the major news-media, the major universities, the principal entertainment-media, and the most powerful factions in the leadership of both major political parties. Yet, the majority of the population has an organic political-cultural tradition directly opposite to the philosophy of the liberal establishment. So, the real United States is a kind of net result of the conflict and pragmatic accommodations between these two opposite political tendencies.

The same is true, in principle, of Italy, Germany, France, and so forth, in western Europe, and is also the case in the Spanish speaking republics of the Americas. The historian (and famous dramatist) Friedrich Schiller, identified this internal cultural conflict within european civilization as dating from the conflict between the two opposing models of classical Greek society, the opposition between the Lycurgan slave-society of Sparta and the constitutional republicanism of Solon's Athens. All Mediterranean history over 2,500 years is an unfolding of the ebbs and flows in the conflicts between these two opposing currents of european philosophy.



*Solon of Athens*

For reasons which appear chiefly accidental, my twenty years' championing of the cause of a new world economic order, with justice for the developing nations, has put me near the center of the efforts to regroup the fragmented but extensive forces of european culture which represent today, more or less consciously, the heritage of the republican current. This has made me increasingly "unacceptable" to the trans-Atlantic

rentier-financier faction, but the fact that I, a person without income or formal position, could be considered so much a danger by those establishment forces, attests to the large republican potential waiting to erupt under those kinds of conditions of crisis which bring dominant institutions periodically into general discredit.

My peculiar relationship to the Reagan faction among Republicans illustrates the point very well. Although I deplore the "free-trade monetarist" dogmas which mislead the Reaganites generally, there are "non-ideological" areas of instinctive, organic agreement with many of my views among them. It was for that reason, that my February 1982 proposal for a radical change in U.S. strategic doctrine was adopted publicly by the President on March 23, 1983. Among "normal" Americans, whether industrial entrepreneurs, farmers, industrial operatives, military professionals, scientific professionals, or the majority of relatively deprived minorities, there is a general agreement in philosophical-political world-outlook, which converges upon my own views.

My chief "political difficulties" in dealing with such "normal Americans," are of two classes. First, the U.S. population is fragmented by attachments to conflicting sorts of shallow minded "ideological recipes"—such as the "balanced budget" insanity presently gripping the attention of the U.S. Congress. Second, "normal Americans" are wedded to a special kind of moral corruption in political life, called "pragmatism." I include a copy of the October 1985 edition of the periodical, *The Campaigner*, with emphasis on the publication of Mr. Webster Tarpley's January 13, 1985 address on the "American Ideology" in that location.

Each of the nations of the Americas and Europe are dominated by rather distinct "national ideologies," paralleling the "American Ideology" as described by Mr. Tarpley. The most essential feature common among these otherwise rather distinct "ideologies," is that they reflect the efforts of populations divided between essentially two opposing philosophical world outlooks, to find a pragmatic accommodation between their forces in matters of the day-to-day life of the nation.

*Nicholas of Cusa*

*Leonardo da Vinci*

*Johannes Kepler*

*Gottfried Wilhelm Leibniz, portrayed by Johann Friedrich Wentzel.*

The philosophical current to which I adhere, is the republican current, as typified by Plato, St. Augustine, Alcuin, Dante Alighieri, Nicholas of Cusa, Leonardo, Kepler, Leibniz, Benjamin Franklin, and Friedrich Schiller. This was also the current of the nineteenth-century American Whigs (Henry Clay, James Fenimore Cooper, the Careys [Matthew and his son Henry C. Carey], Abraham Lincoln, and the 1815-1830 international faction led by the Marquis de Lafayette). This is a philosophical current in physical science (Cusa, Leonardo, Kepler, Leibniz, Carnot, Gauss, Riemann), as well as in principles of statecraft more generally. In science, this faction is opposed to Francis Bacon,

*Francis Bacon*

*Isaac Newton, painted by Godfrey Kneller.*

*Augustin-Louis Cauchy, in a lithograph by Zéphirin Belliard.*

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*Ludwig Boltzmann*

Newton, Laplace, Cauchy, Clausius, Kelvin, Helmholtz, Rayleigh, Boltzmann, and the modern positivists.

Against this background, the question of the economic impact of SDI-related technologies can not be separated from four particular issues, assorted among two categories of general area of inquiry.

The first area to be considered, is: the issues of physical science, as they may be located as issues internal to western european culture:

1. The two axiomatically irreconcilable conceptions of political-economy, corresponding, respectively, to the two opposing currents within the recent 2,500 years of european culture.

2. Two axiomatically irreconcilable conceptions of "scientific method," each corresponding to one of the two principal, mutually exclusive, philosophical outlooks characteristic of european culture.

The third and fourth particular topics, fall under the category of interactions between european and (for example) Asian cultures:

3. The question, whether the distinctions between european and Asian (for example) cultures are relative or absolute. The corollary proposition is: do the cultures of Europe and Asia have some common root, either an historically explicit common origin, or at least an axiomatically convergent type of common basis?

4. The implications of the so-called "New Yalta" pact, for evolutionary redivision of the political map of the world, between the Soviet and Anglo-American establishments: the use of "nuclear deterrence" as a lever for crisis-management-directed evolution of a single world-wide imperial confederation of satrapies, as a new sort of utopia, a new sort of "global *Pax Romana*."

On the latter, fourth point: shall we permit this "New Yalta" scheme to continue its course, or shall we reverse present trends, and bring into being a world order based upon political equality of members of a family of sovereign nation-states? As I embedded this axiomatically in my design of the proposed new strategic doctrine for the U.S.A., SDI threatens the continuation of "nuclear deterrence," and therefore threatens the "New Yalta" imperial scheme at the root.

I summarize the two categories of subject-areas, and the four points, *seriatim*. I then summarize the common characteristic of the four points, and, finally, situate the formulation of the causal connection between science and economic growth within that context summarily described.

## Categorical Area 'A':

## European Science & Political-Economy

Among the German-language specialists in China, there is an important circle knowledgeable of Schiller, the Weimar Classic, and the Leibniz-Gauss-Humboldt Göttingen-Freiburg tradition. More recently, the principal channels of european cultural contact of China's academic professionals, are dominated by Anglo-American universities and by the professional communities associated with those universities.

I am less poorly situated to estimate the important question, how China's professionals have assessed the echoes of these same methodological issues of european thought within Soviet society.

Historically, since Peter the Great and the establishment of the Leibnizian Petrograd Academy, there has

been a persisting and important element of the Leibniz-Gauss heritage in Russian science. This was strengthened by the influence of Pasteur Institute-trained Riemannian, Academician Vernadsky, and was strengthened afresh, as the indirect influence of Prandtl and Busemann, by Soviet recruitment of thousands of Peenemünde aerospace veterans for the Soviet nuclear and aerospace programs. Historically, in Czarist Russia into the Soviet period, Petrograd-Leningrad was the bastion of true physical science in Russia, and Moscow the bastion of the d'Alembert-Laplace-Cauchy-*et al*., opposing (French) faction.

The work of Parvus's N. Bukharin, G. Ryazanov, *et al*., on shaping the Soviet doctrine of "diamat," tended to strengthen the position of the "French-Viennese positivist" faction, to the disadvantage of the "Petrograd tradition." Hence, the best Soviet scientific work in plasma physics and biology today, "walks along the brink of methodological dissidence" (relative to "diamat").

*Charlemagne, painted by Albrecht Dürer.*

China's professionals must have seen symptoms of this shadowy methodological conflict within Soviet scientific practice, but I have no indications that China's professionals might have extended such observations, in analysis of the deeper, axiomatic and historical, implications of this shadowy methodological conflict within Soviet professionals' ranks.

Since 1982, in particular, I have contributed significantly to intensifying attention given to the Soviet side of this methodological issue.

During the period, February 1982 into March 1983, I presented my proposal for U.S. SDI to relevant Soviet channels (naturally, with the knowledge of relevant circles of my own nation), in the hope that Moscow would accept the kind of change in strategic relations which the President later offered to the Soviets in the close of his March 23, 1983 address Moscow agreed with the objective feasibility of the proposed change in strategic doctrine (and relationships), but rejected the offer bitterly, on the grounds that, were the U.S. to mobilize itself for development of such strategic ballistic missile defense based upon "new physical principles," the U.S. economy would rapidly overtake and surpass the Soviets through the U.S.'s greater ability to assimilate new military technologies rapidly into the civilian economy. I responded to this Soviet objection, by pointing out certain of the more obvious reasons Soviet industrial management virtually sabotaged efforts to introduce technological improvements into civilian-sector production, and argued that if this correctable problem of Soviet industrial management were addressed, the practical basis for their objecting to the U.S. SDI proposal would be removed.

I must admit that the Andropov-Ogarkov-Gorbachev stratum has acted to correct the problem I identified. However, they cannot succeed in their current efforts to change qualitatively Soviet industrial management practice, unless they emphasize the Leibniz-Gauss-Riemann tradition, to the disadvantage of the Descartes-Laplace-Cauchy faction. Nor, can the U.S.A. and western Europe implement the SDI effectively, without resuming notions of economic policy consistent with the standpoint of Colbert, Leibniz, and the Hamilton-Carey-List American System of political-economy generally.

## 1.
## European Political-Economy

Implicitly, european political-economy begins with Charlemagne's founding of a new political order. Leading features include Charlemagne's famous census, and his scheme for developing the economy of Europe through construction of a system of canals, the latter including the yet-to-be-completed Rhein-Main-Danube canal-system. Modern european political-economy proper, began five centuries after Charlemagne, with

the collaboration between George Gemistus (Plethon) and Cosimo de Medici at Florence.

There were two, overlapping circumstances responsible for the founding of the principles of national political-economy during the Golden Renaissance.

First, Dante Alighieri had already proposed the replacement of supranational government by a system of sovereign nation-state republics, as in his famous *De Monarchia*. Self-government required that a people united by use of a common form of literate language constitute a sovereign republic. These states would be sovereign on condition that each and all adopted equality of states and persons under a universal natural law (as "natural law" is defined by Nicholas of Cusa, Leibniz, *et al*., for example).

*Dante Alighieri, portrayed by Andrea del Castagno.*

Second, the alliance of convenience between the insurgent Ottomans and Venice, threatened the imminent Ottoman conquest of Paleologue Greece and the overrunning of western Europe. Plethon had already proposed to the Paleologues a program of economic development and population-growth, as the sole means for affording Constantinople the economic-strategic strength in depth needed for defense. Plethon restated and expanded this proposal for Cosimo de Medici. These two letters of Plethon's, already embody comprehension of political-economy more advanced, and more rigorous, than anything to be found in the Physiocrats, Adam Smith, or David Ricardo.

These developments overlapped the leading influence of the young Nicolaus of Cusa's 1431 *Concordantia Catholica*, in which is delineated a universal order of law governing the establishment of a concord of sovereign nation-state republics. The pivotal development, combining all these and related efforts into a single policy-thrust, was the 1439-1440 Council of Florence, establishing the ecumenical alliance of western Europe with Paleologue Greece.

The correlated feature of these developments, was that Plethon delivered to Cosimo a library of the Greek writings of Plato, Archimedes, and others. Many sets of copies of these documents were transcribed under the sponsorship of Cosimo, and distributed throughout Europe. European thinkers assimilated this revival of classical Greek scientific knowledge from the standpoint already established by St. Augustine's writings. On this basis, Cosimo founded the Academy at Florence, on the model of Plato's Academy—just as Gottfried Leibniz later established the network of academies including those whose conspiratorial efforts created both the American Revolution and the introduction of the 1809-1814 republican reforms of Prussia by the circles of Friedrich Schiller.

From the fifteenth-century beginnings of modern national political-economy, the ideas of national economy and scientific technological progress were inseparable. The principles of scientific progress were established by Nicholas of Cusa, beginning his 1440 *De Docta Ignorantia*. The elaboration of these principles into a self-unfolding set of interdependent advances in fundamental scientific research and technological progress, was set into motion by the collaboration between Luca Pacioli and Leonardo da Vinci.

The notion of "political-economy" congruent with the idea of national economy, is therefore a conception no older than about 450 years. It is originally a product of developments within western european culture, and came into existence as a leading feature of a revolutionary transformation in european culture approximately 450 years ago. Excepting pioneering, but aborted developments of aspects of national economy in fifteenth century Florence, the first modern nation-state was the creation of France out of a collection of fragments, by King Louis XI, and the second modern nation-state the Tudor England established under the guiding influence of the Erasmian representatives of the Golden Renaissance.

Obviously, the scientifically adducible principles of modern national economy are very, very ancient, since

they are principles which flow from the nature of conscious life within the universe as a whole. Accordingly, even from pre-history, we can rightly adduce elements of social practice which anticipate aspects of the institutions of national economy. However, national economy as institutionalized behavior of society, was a creation of the european Golden Renaissance. So, although national economy ultimately reflects the general laws of the universe, all that is specific to a science of national economy pertains to the special laws of internal behavior of a variety of institutions which did not exist prior to the Golden Renaissance.

National economy rejects axiomatically, any assumption to the effect that the cultural needs and mental potentials of human individuals vary in any way according to ethnographical differences. We all live in the same universe, which has the same laws throughout; the essential distinction which places mankind above the beasts, is the same for all people; experience has corroborated the fact, that any person of any ethnographical background, afforded equal opportunities of material life and mental development, will tend to be as fecundly creative as a similarly placed person of other ethnographical distinctions.

Ethnically, the United States, and the states of the Americas generally, are a blending of numerous ethnographical backgrounds. The Germans sharing modern "new high German," are ethnically a mixture of many branches of the populations which occupied Europe through migrations from Central Asia. The speakers of French, Spanish, Italian, and so forth, in western Europe, constitute "nationalities" which are blind to ethnographical differentia by definition of law.

It is only in portions of Europe and the Mediterranean littoral generally, which carry forward the relics of Byzantine culture, that the idea of "nation" as equivalent to race, religious profession, or other "ethnographical" distinction, persists as a generally accepted notion. In this respect, modern "Zionism," for example, is an anti-european, asiatic idea. It is notable, that "ethnography = anthropology" was a creation of a Swiss controlled current in France during the middle of the nineteenth century, the first of the so-called "new (social) sciences" engendered by the nineteenth-century spread of Franco-Swiss positivism. "Ethnography" and modern european culture are contradictions in terms.

The first known surviving traces of the root-idea of the Golden Renaissance are found during the sixth and fifth centuries B.C., in both Panini's Sanskrit philology


Department of Posts, India

*Postage stamp commemorating Daksiputra Panini, the ancient Sanskrit philologist and grammarian.*

and the developments around the Ionian city-state republics and Athens.

The earlier, Egyptian and central Asian roots of the relevant contributions of Panini and the classical Greeks are buried in pre-history. The effort by Charlemagne *et al*. to establish a new form of society based on medieval Latin, is a more immediate precedent for what developed under the Golden Renaissance. Yet, these earlier developments are but forerunners of a very distinct revolution in notions of the institutions of society established by the Golden Renaissance.

The kernel of the revolutionary idea leading into the Golden Renaissance's establishment of the modern european notion of sovereign nation-state, is Dante Alighieri's principle: that the use of an administrative medieval Latin had contributed to the propagation of popular language as a collection of brutish local dialects, and thus to fostering of the brutish conditions of people generally. The transformation of brutish dialects into literate forms of language, consistent with (in fact) Panini's principles and the principles of the highest degree of development of classical Greek (e.g., Plato's Greek), must impart to all of the people what the poet Shelley described as the "power of imparting and receiving the most profound and impassioned conceptions respecting man and nature." The sharing of moral and scientific conceptions, through the medium of such a literate form of language, combined with self-government by the speakers of such a literate form of language, is the essence of the Golden Renaissance conception of the sovereign nation-state republic.

The premise of the sovereign nation-state republic

is the development of that which is exemplified by the creative scientific potential of the individual personality.

Scientific discoveries (rigorous hypotheses) are products of individual minds, and are, at the same time, the individual's contribution to the benefit of all humanity. Although every such discovery is potentially obsolete, it itself contributes to the possibility of its successor. Hence, the essence of scientific progress is not the individual discovery as such, but rather the act of individual discovery as a contribution to advancement of a continuing process of advancement of mankind's mastery of the lawful composition of the universe.

*Friedrich Schiller*

The essential function of society, is, severally, to develop this kind of potential in all young members of the nation, to afford the individual the opportunity to contribute the benefit of that developed potential in some useful way, and to defend the durability of the benefit created by the individual, to the advantage of present and future generations.

Although scientific and technological progress are the exemplification of this process, the work of Pacioli and Leonardo, of the school of Raphael, and the argument against Kant in Friedrich Schiller's *Aesthetical Letters*, illustrate the point, that, for Golden Renaissance humanism, progress in scientific truth and progress in the creation and celebration of beauty are not merely equally necessary, complementary activities, but that the creation of truth and the creation of beauty, are activities drawing upon one and the same indivisible faculty of the individual's potential for creative reason.

At first glance, the functions assigned to a rational practice of national economy, are twofold.

To develop the potential of the individual, requires producing the material conditions of individual life necessary to such development. If we are to maintain a school-leaving age of between 18 and 25 years, necessary for modern technology, we must have high rates of longevity and health, into approximately the seventieth year of individual life for members of the labor-force, which means average life-expectancies reaching to, and beyond, the eightieth year of life. To achieve such demographic goals, means adequate nutrition and sanitation, and a shift away from those forms of labor-intensive toil which are a leading contributing cause for early death among those over forty years of age, in societies characterized by labor-intensity. This merely illustrates the general nature of the correlation between potential development of the individual and material conditions of life.

This progress in the human condition is not possible without technological progress. In a so-called "hunting and gathering mode," approximately 10 square kilometers are required per person. This would signify a world population of approximately 10 millions as an upper limit, with life-expectancies substantially lower than 20 years of age. Technological progress has increased the potential relative population-density by approximately three orders of magnitude, while making possible the levels of longevity and productivity necessary to an 18-to-25-years school-leaving-age modality.

The second aspect of rational national economy's benefit, is fairly described as "moral." Whenever man engages in labor-intensive toil, in the fashion of his father and grandfather before him, man mimics the lower beasts, whose range of behavior is fixed as if genetically. It is the self-development of man's behavior, to the effect of changes which progressively increase man's power over nature, which distinguishes men above beasts; it is the activity responsible for this progressive self-development, which is appropriately human activity.

It happens, that in any fixed level of technology, there is a marginal depletion of some of the essential natural resources upon which that mode of production depends. Hence, in a society based upon a fixed technology, the productive powers of labor must fall, leading to either periodic or terminal catastrophes in the form of famine, epidemic, and so forth. Thus, repetitive

labor at a fixed level of technology does not represent the source of value of labor; the value of labor is expressed by those creative mental potentials through which technological progress is discovered and efficiently assimilated by the productive process. It is the aspect of labor which encompasses progressive technological innovation, which is the essence of the economic value of labor.

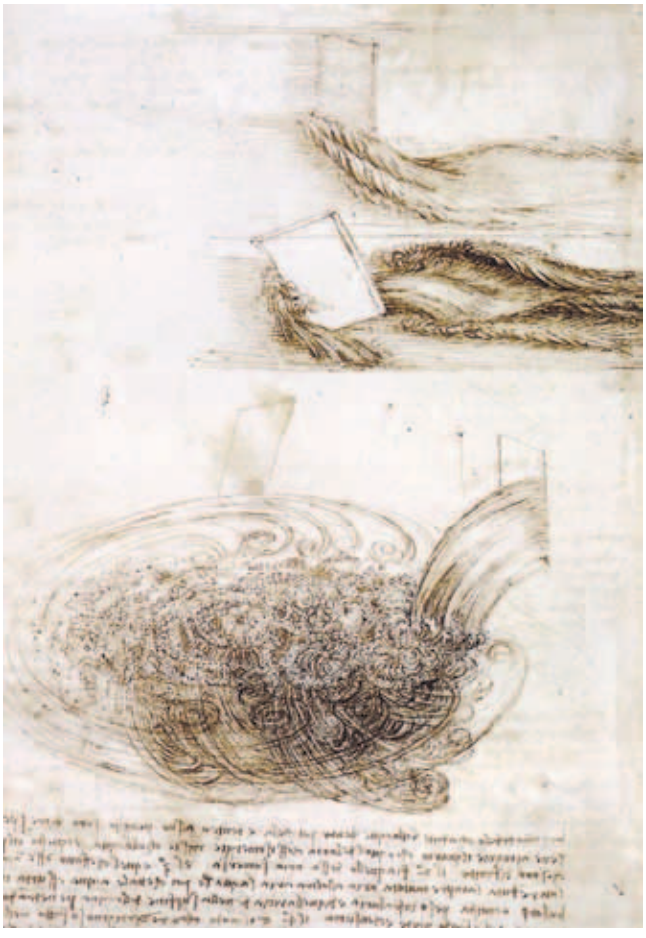
So, twofoldly, technological progress is indispensable to production of the material preconditions of human life, and only production organized according to the principle of technological progress affords to labor a form of existence which is consistent with man's superiority to the beasts.

This implicitly poses the question: Is material progress the primary purpose of production, and advancement in scientific truth and beauty merely a necessary by-product of that progress? Or, is material progress merely the indispensable means for development of that individual faculty of creative reason from which scientific truth and beauty flow? I propose, that truth and beauty are the primary goal, and technological progress merely the necessary means by which the primary goals are advanced. My standpoint is that of the Golden Renaissance, of Cusa and Leonardo most notably, as of Leibniz, Schiller, and so forth, after them.

In this view of the relationship among technological progress, truth, and beauty, is encapsulated the essence of the Golden Renaissance's notion of a rational ordering of national economy, and the broader notions of statecraft under which the idea of national economy is subsumed.

## A Short History of Political-Economy

The first modern nation-state, committed to these principles, was the France reconstructed by Louis XI. Louis approximately doubled the per-capita national income of France during his reign, and established the pattern which made France the world's leader in science and development of industry into 1815. (The idea of British eighteenth-century leadership in development of science and industry, is a false legend, made possible by the nineteenth century power of the British Empire and the Anglo-Americans' domination of twentieth century myth-making. The documents and statistics from the seventeenth into the nineteenth century are ample, and conclusive on this point of historiography.) Tudor England was the second of the modern form of nation-state; but from the crisis-period of 1589-



*Studies of water in motion by Leonardo da Vinci, c. 1508-9.*

1603, and under the later Stuarts and their successors, Britain reverted to the Roman imperial model of state-philosophy, and prevailing preference for the rentier-finance model of economy, such that into the present century, France, and later Germany, were the world's leaders in technological progress.

The integration of science and technological progress, as projected by Cosimo de Medici's Florence, was established beginning the 1480s, by the collaboration between Luca Pacioli and Leonardo da Vinci at Milan. The application of Nicholas of Cusa's discoveries in scientific method, produced the elaboration of what we call today "synthetic geometry," by Pacioli and da Vinci. Out of this, Pacioli and da Vinci established the science of biology, in the direction of the emphasis on optical biophysics associated with Pasteur and Pasteur's students among contemporary U.S.A., european, and Soviet optical biophysicists ("non-linear spectroscopy"). In accord with the same geometrical method, Leonardo developed hydrodynamics in the direction

realized by Riemann, Prandtl, *et al*., and, in this context, developed a general doctrine of the finite speed of light, and of the waveform of all radiation of energy consistent with the later work of Gauss, the Webers, Dirichlet, Weierstrass, Riemann, *et al*. Within this context of geometrically defined hydrodynamics, Leonardo developed the principles of design of machinery (polytechnique) up to the point the principles of powered machinery were later elaborated by Gottfried Leibniz, and Leibniz's work given elaboration by Lazare Carnot and the French École Polytechnique under Gaspard Monge.

*Jean-Baptiste Colbert, in a portrait by Philippe de Champaigne, 1655.*

The notions of technology and national economy, as defined by the work of Leonardo, were elaborated at Naples and elsewhere under the rubric of "cameralism"(statecraft). These sixteenth century notions reached their highest form of expression under the great French minister, Jean-Baptiste Colbert. Gottfried Leibniz, beginning his short treatise of 1671, "Society & Economy," transformed "cameralism" into a true economic science, as a byproduct of his 1672-1676 discovery of the form of differential calculus earlier specified by Johannes Kepler.

The kernel of Leibniz's discovery of the principles of an economic science, is elaborated in my 1984 elementary textbook, *So, You Wish To Learn All About Economics?* Since I forward a copy of that text to accompany transmission of this letter, the following summary is sufficient here.

Leibniz's point of departure, was study of the relationship between the increase of power supplied to a machine, and increase of the productive powers of labor of the machine's operator. This situates the crucial sort of special case, in which two machines may be, hypothetically, powered by the same amount of coal's combustion per hour, but the output of the one is greater than that of the other, if both machines are used by the same operator. In this crucial case, the difference in performance of the machines can be attributed only to differences in the internal organization of the machine. This notion of internal organization of machines is the rigorous notion of "polytechnique," or, the term passed on to us through German usage, "technology."

The combination of the ideas of state credit, passed to the Americans by the Tudor economists and Colbert, with the influence of Leibniz's discovery of principles of physical economy, formed the political-economic ideas of Benjamin Franklin, and, established, in turn, U.S. Treasury Secretary Alexander Hamilton's "American System of political-economy." Up to 1815, the eighteenth-century elaboration of Leibniz's economic science by Americans was paralleled chiefly in France and Prussia. In France, this development was centered around Lazare Carnot and Monge's École Polytechnique, featuring such leading economists as Chaptal, Ferrier, and Dupin. In Germany, Leibniz's physical economy was taught under the cameralism curriculum (into the early nineteenth century), notably including Göttingen and the Freiburg center at which Alexander von Humboldt was educated. Following the triumph of feudal reaction at the 1815 Treaty of Vienna, the three—American, French, and German—currents of economic science were fused, under the catalytic direction of Gilbert Marquis de Lafayette, then the head of the American Society of the Cincinnati. This fusion of the work of the three currents became the enriched American System of political-economy adopted by the American Whig leaders through Abraham Lincoln and Henry C. Carey. It was this economic science which was introduced to Japan's Meiji Restoration by the American Whig collaborators with that Restoration, over the resistance of the already strong British opposition to such economic development of Japan at that time.

A valid form of English political-economy developed during the sixteenth century, but this current was crushed in Britain by the 1603 Stuart accession and 1660 Restoration. Tudor political-economic conceptions were confined to the American colonies and to the factional circles around Leibniz's ally, Johnathan Swift,

in England, Ireland, and Scotland. Excepting the case of the last portion of Queen Anne's reign, the Stuart, Orange, and Hanoverian monarchy, was dominated, first, by the simple rentier-financier dogmas of Bank of England founder William Petty. Formal political-economy was introduced to England by Petty's grandson, the second Earl of Shelburne, beginning 1763. Shelburne assigned Adam Smith to study under the physiocrats, including Quesnay, in France and Geneva, leading to Smith's famous plagiarism of the work of A.M. Turgot, *The Wealth of Nations*, the latter written as a propaganda tract defending the policies of the British East India Company in the opium-trade and the colonial policies against the Americas.

*President Abraham Lincoln*

*Henry C. Carey, painted by Charles R. Leslie.*

In strict fact, the leading issue of the American Revolution was the Americans' rejection of the political-economy of Smith's *The Wealth of Nations*.

Henry C. Carey rightly emphasized, that the British economy was not a capitalist economy, but was, rather, a "mixed" capitalist-feudalist economy, with the feudalist element of rentier-finance economically and politically dominant. Whereas "cameralism" had defined political-economy as a matter of development of the productive powers of labor, and fostering of those investments essential to technological progress, Swiss, physiocratic, and British political-economy opposed this policy of fostering technological progress, and demanded that the feudal rentier-finance interest be dominant.

By "feudal," used in such a context, one ought to signify an alliance between the Venetian financier-nobility and those aristocratic houses of Europe based on ground-rent income. From approximately the eleventh century A.D., as Venice became, first, the center of Byzantine power in the West, and later the successor to Constantinople, the spread of the Venetian practice of "Lombard banking" transformed the feudal ground-rent relations into debt-service obligations of the major and lesser potentates of Europe. The role of the Bardi and Peruzzi in causing the "new dark age" of the fourteenth century, is the exemplar of this transformation of feudalism into rentier-finance feudalism.

It was the collapse of the economy and dominant political institutions of most of Europe, through the middle of the fourteenth century, which was exploited by the continuing faction of Dante Alighieri, Petrarca, *et al*., to launch the Golden Renaissance as an effort to eradicate rentier-finance feudalism from european civilization.

The history of Europe from 1401 through 1815, is as follows. The temporary defeat of the Ottomans, by Timur (Tamerlane), created both the possibility and urgency of organizing both Paleologue Greece and western Europe, to defeat the inevitable next Ottoman onslaught. Venice regained much of the power it had lost to the Golden Renaissance's forces, by allying itself with Moscow, Mount Athos, and the Ottomans, to destroy and dismember Paleologue Greece in 1453 A.D. Venice's power spread in Italy, assimilating its Genoese competitor, and conquering Florence, Milan, and Rome, during the period leading into the 1525 Habsburg sack of Rome. The Venetian-Genoese Levant Company used its combined power, to bring its puppets, the

Jean-Baptiste Isabey, 1819

*"The corruption of France by Napoleon's dynastic delusions, and the triumph of feudal reaction at the 1815 Congress of Vienna, shifted the balance of forces to the rentier-financier faction."*

Habsburgs, to power. Thus, the period from 1520 through Mazarin's defeat of the Habsburgs in 1653, is a "little new dark age" in the history of Europe. The factional forces of the Golden Renaissance, survived in France, in Tudor England until 1589, and in the school at Naples, but a feudalist reaction soon led by Venice's creation of the Jesuit order, triumphed through such means as the Inquisition and the 1618-1648 Thirty Years' War in Central Europe. The period 1653-1789 was a general state of war in european civilization, between the France-centered republican faction and the powerful, Venice-centered rentier-financier faction. The corruption of France by Napoleon's dynastic delusions, and the triumph of feudal reaction at the 1815 Congress of Vienna, shifted the balance of forces to the rentier-financier faction.

However, the fight was not yet ended. The rise of the Whig faction in the United States, the resurgence of the faction around the Humboldts in Germany, and the work of Cavour, Betti, *et al*., in Italy, typify the continuation of rearguard battles for progress in science and political affairs through the 1860s. The events of the 1870s, centered around the passage of the treasonous U.S. Specie Resumption Act and the Congress of Berlin, secured the triumph of the rentier-financier faction over world-economy and most of the shaping of world politics. This shift of the 1870s, launched what has become, over approximately the recent hundred years, a "new dark age "in european civilization.

At the turn of the present century, the Marxists, and others, adopted the more or less Hegelian view, that the new international relations embedded during the 1870s, constituted the emergence of "imperialism" from capitalist development. The only Marxist to come near to the truth of the matter, was Rosa Luxemburg. The Marxists based their estimate on Marx's erroneous insistence, that the British model of political-economy, of the physiocrats, Smith, Malthus, Ricardo, *et al*., represented the lawful and highest relative form of development of capitalism. (Marx's writings throughout, show that he was ignorant of the history of development of both political economy and of physical science, generally, and of the pivotal roles of Cusa, Leonardo, Kepler, the "cameralists," Leibniz, Hamilton, the Careys, and Dupin, as well as of the work of such scientific contemporaries as Gauss, Riemann, *et al*. Marx's attacks on the American System, in the form of his attacks upon List and Henry C. Carey, are also indicative of the nature of his false composition of the centuries of european civilization up through his own adult lifetime.)

If the history of the matter is rightly known, "imperialism" is correctly, and more readily understood.

The rentier-financier interest responsible for "imperialism," explicitly modelled its utopian dogmas upon the models of the first Roman Empire and the new Roman Empire established in the East under the terms of the Diocletian reforms. For example, the circles around the British East India Company, under Shelburne's leadership, explicitly set out to make Britain the "Third Roman Empire." Gibbon's study, sponsored by these circles, was merely one notable part of a set of extended studies of the old Roman Empire, conducted to the purpose of designing the sort of global *Pax Britannica* which might not collapse as had old Rome.

During the nineteenth century, under the leadership of the Venice-guided Acton family, and such projects as Ruskin's Pre-Raphaelite Brotherhood, and the launching of the Fabian Society in the 1880s, the idea

of establishing a global *Pax Britannica* became increasingly an obsession with the dominant elements of the British establishment. More generally, the entirety of the rentier-financier faction, to the present day, is dedicated to the establishment of a "Third (and permanent) Roman Empire." As part of this, that faction has adopted the essential features of the Diocletian Reforms as the model of reference for prescribing the political, economic, religious, and social composition of a "global society" modelled upon a byzantine sort of "*Pax Romana*."

This notion of a "Third Roman Empire," to replace a world order based on sovereign nation-states, is the basis for both the agreements between Moscow and the Liberal Establishments of the trans-Atlantic region, and for Moscow's sly and brutal preparations to outwit the "useful fools" among its ostensible, liberal, partners in "global society."

The seizure of control over debts of nations, of national banking systems, and of most of world trade, by the supranational rentier-financier faction, sometimes called "imperialism," has meant that the practice of political-economy, both by governments and private interests, has been regulated according to the terms of rentier-financier doctrines. The control of universities, of major news-media, of the leaderships of major political parties, and of entertainment media, by the rentier-financier faction, has meant that the rentier-financier dogmas are presented to credulous professionals and the general public alike, as if those dogmas were the only competent version of political-economy which ever existed.

Hence, during this century to date, what was known as political-economy, from Cosimo de Medici through the American Whigs and Abraham Lincoln, has been erased from the collective memories of universities, professional economists, and politicians alike. Only assorted varieties of monetarist doctrine are accepted as "economics," in universities and among *soi-disant* professionals today.

Meanwhile, the consequences of nearly a century of almost unchallenged rentier-financier rule, parallel those which developed during the hundred years following the 1250 A.D. death of Frederick II (Hohenstaufen). As the Bardi and Peruzzi of the fourteenth century plunged Europe into a genocidal "new dark age," so the contemporary "Lombard bankers," acting out a modern edition of the same rentier-financier philosophy, are plunging the planet into another "new dark age."

## Fallacies of Monetarist Political-Economy

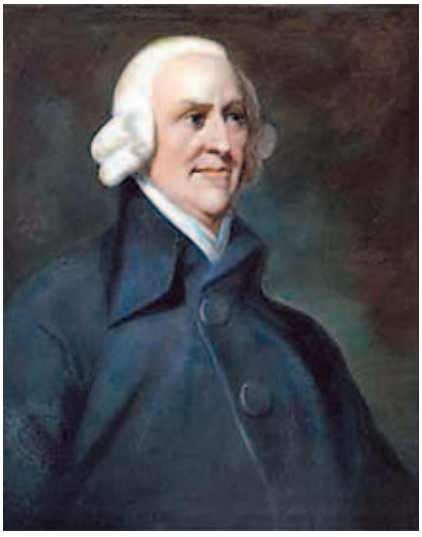
It is typical of this circumstance, that the U.S.A.'s present National Income Accounting system, developed under the direction of Harvard's Professor Wassily Leontief, is purely a monetarist dogma, despite its pretense to include measurement of physical economy. The same is true of the corresponding form of measurement, the Gross Domestic Product system, used by the UNO. For reasons internal to the principles of the method employed, the measurements of performance of the U.S.A.'s (and, other) economy, accomplished by such systems, are to a very large degree absurdities.

The proof that such measurements are absurd, is most readily adduced by summary examination of the historical roots of the Leontief doctrine, and of the complementary doctrines of "systems analysis" defined axiomatically by John von Neumann.

The attempts to devise a doctrine of physical economy consistent with rentier-finance interests, begins with the Jesuits' concoction of the Physiocratic dogma. The essential, fundamentally false, assumption of the physiocratic dogma, is that physical wealth is limited to a fixed rate of potential "bounty of nature." The increase of mankind's potential relative population-density, by approximately three orders of magnitude, since "hunting and gathering," is adequate demonstration of the absurdity of the physiocratic dogma.

The notorious "Malthusian" dogma is but a variation of the physiocratic. The dogma was first elaborated by the Venetian Giammaria Ortes, and Ortes' thesis was plagiarized by the British East India Company's Thomas Malthus, at the request of Shelburne's puppet-Prime Minister, Pitt, as propaganda-basis for willfully murderous repeal of the English Poor Laws. The policy embedded in this dogma long antedates Ortes; it is the population-policy specified by the Diocletian reforms. Thus, the launching of the Ortes-Malthus dogma during the eighteenth century, and the imperialists' unleashing of "neo-Malthusianism" today, are to be understood historically.

The introduction of the physiocratic dogma into Britain, through David Hume, Adam Smith, and Jeremy Bentham, involved a significant shift beyond the form given by Quesnay. Earlier, prior to 1763, David Hume had led a Europe-wide attack against the influence of Leibniz, most emphatically, and the principles of the Golden Renaissance generally. Instead of man's will reshaped by scientific progress in knowledge of universal law, Hume avowed universal law to be un-



*Adam Smith*

*David Hume, painted by Allan Ramsay, 1766.*

*Thomas Malthus*

knowable to man. Like his student, Adam Smith, Hume insisted that man knew only the impulses of his own immediate and original, hedonistic, impulses ("instincts"). The application of this hedonistic doctrine of irrationalism to political-economy, by Smith and Bentham, is the specific distinction at the foundation of British (and positivist) political-economy to the present day.

In Smith's doctrine of the "Invisible Hand," Smith simply extended Hume's hedonistic irrationalism, as Smith himself had restated this in his 1759 *The Theory of Moral Sentiments*. Man is incapable of knowing, Smith insisted, what might be the consequences for society of choosing to give priority to one or another sort of economic investment or productive activity. By following his hedonistic impulses, from moment to moment, Smith insisted, a kind of "ergodic principle" causes the sum-total of such irrationalist, hedonistic impulses, to converge upon an optimal result for society in general.

Smith's hedonistic irrationalism was restated in a more radical version by Jeremy Bentham. Bentham argued that the workings of the Invisible Hand could be followed arithmetically by aid of a "felicific calculus." This doctrine of the "felicific calculus," was explicitly adopted as the primary basis for the doctrine of marginal utility, by John S. Mill, Jevons, and Marshall. A kindred approach was devised by the synarchist founder of the (fascist) Lausanne School of economics, Léon Walras, out of which emerged the so-called "Vienna School," and the work of John von Neumann.

Later, the Fabians, as typified by Mrs. Joan Robinson, attempted to correct for the holes in a purely monetarist sort of doctrine of "marginal utility," by syncretizing assorted bits borrowed variously from Karl Marx and Walras, to establish today's "Cambridge School of systems analysis."

In the U.S. today, there is a shading of difference between two factions of "systems analysis," a difference celebrated by the 1950s quarrel between professors Wassily Leontief and Tjalling Koopmans. In that quarrel, in which I sided with Leontief on the issue debated, Leontief accused the neo-positivists of the Operations Research Society, around Koopmans, *et al*., of being "ivory tower" doctrinaires. In other words, Leontief is, by distinction of emphasis, an inductive empiricist; whereas, the radically neo-positivist varieties of systems analysts attempt to construct economic models according to a set of axioms incorporated in a radically axiomatic algebra. Leontief attempts to construct inductive algebraic analysis of empirical relations, whereas the neo-positivistic radicals superimpose axiomatically assigned values of a "Robinson Crusoe model" to arrays of data.

The worst variety of "ivory tower" systems analysis, is that based on the prescriptions of John von Neumann. Von Neumann insisted (1938), that economic analysis could be performed as solutions to systems of linear inequalities. This means a fixed array of inputs and outputs, and more or less fixed constraints for the terms of expressions bearing upon physical economy of production and consumption. This is, rather transparently, the old physiocratic dogma revived.

Leontief has, until recently, insisted upon employing linear methods of analysis not differing essentially from that of Von Neumann *et al*. The wide circulation of my own work, during 1980-1982, and the circulation of my 1983 observations on "non-linear spill-over effects" of SDI research, impelled Leontief to take up the issue of "non-linear" effects within economic processes. The approach he adopted for this latter purpose was absurd, as I have indicated in the paper forwarded to you earlier, but at least he recognized the existence of the problem of "non-linearity."

The most obvious problem of so-called conventional political economy, such as the GNP system, is that the aggregating of Value Added makes no distinction between costs incurred as direct or indirect production of physical goods, and wasteful and other forms of overhead expenses. Thus, the 1946-1985 reduction of the percentile of the U.S. labor-force employed in production of goods, from over 60% to less than 25%, is interpreted as "economic growth," on condition that Value Added amounts attributed to purely rentier income, plus services and administration, offset the losses in Value Added caused by collapse of per-capita physical output.

This "honest error, "embedded in the GNP and GDP systems, is compounded by politically motivated bureaucratic falsification of statistics for employment, output, and inflation. The U.S. Departments of Labor and Commerce, the President's Council of Economic Advisors, and the Federal Reserve System have been caught in flagrantly falsifying statistics, in order to appear to show a U.S. "economic recovery," where none in fact existed.

It is to be stressed that the degree of falsification of statistics which continues in Washington, is made possible by the nature of the fallacies embedded in even an "honest" application of a national-income accounting system which is false in axiomatic conceptions.

To continue with the deeper of the relevant issues of political-economy, we must interpolate a summary of the nature of the conflict between the two axiomatically opposing factions of european physical science.

## 2.
## Two Factions in Physical Science

Modern european physical science began with the central of the discoveries in scientific method effected by Nicholas of Cusa, beginning approximately 1440 A.D. (*De Docta Ignorantia*). This was prompted largely by Plethon's delivery to Florence of a library of classical Greek manuscripts, including the writings of Plato and Archimedes. The central of Cusa's discoveries, was his overturning entirely both the axiomatic structure and deductive method of the Ptolemaic version of Euclid's *Elements*. This was accomplished by Cusa's discovery of what we usually name today the isoperimetric principle.

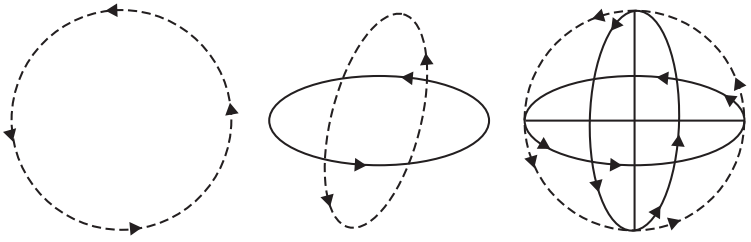
Actually, Cusa's work was to a large degree a rediscovery. The root of Cusa's discovery can be adduced from as early as 6,000-4,000 B.C. in central Asia, in the internal features of the solar astronomy transmitted from that interval (when the equinox was in Orion). The issue of method, bearing upon such Vedic sources, is first known (today) to have been posed by the Sanskrit philologist Panini, about 500 B.C.

Panini insisted, correctly, that the root of all language lies in the transitive verb, rather than the noun. Human perception does not know "things" as such; we know only transformations in physical space-time, or the lack of transformation in such space-time. Hence, the irreducible, or "self-evident" form of existence in physical space-time, can not be a "self-evident thing," such as an hypothetical point or a postulated straight line between two points. Irreducible existence must be in the form of an interval of action, not any axiomatic "thing."

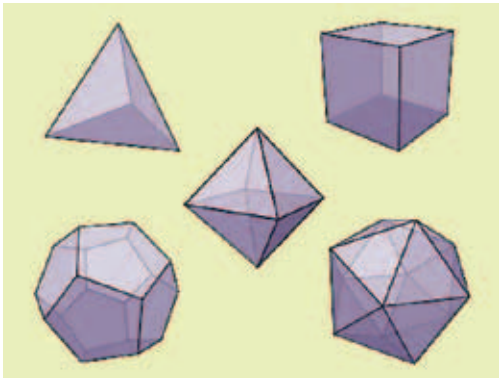
Cusa showed that the only irreducible form of existence in physical-space-time, is circular action, as circular action is defined isoperimetrically (as the minimum line or surface enclosing a maximum area or volume): hence, Cusa termed this his "Maximum-Minimum Principle." This discovery Cusa himself attributes to a thorough reworking of Archimedes' treatment of the problem of quadrature of the circle. Circular action upon circular action, is thus the irreducible form of existence in physical space-time.

Circular action upon circular action, suffices to create the singularities called points and lines. Hence, points and lines between points are not axiomatic existences, but are constructed existences, derived from multiply-connected circular action. As Pacioli, Euler, Steiner, *et al*., have shown, we can construct the entirety of Euclidean space by means of a synthetic (constructive) geometry, which requires no axiom, and no deductive method, excepting circular action upon circular action.

Although Cusa did specify the solar hypothesis later reworked by Kepler as the foundation of mathematical




*"Circular action upon circular action, suffices to create the singularities called points and lines. Hence, points and lines between points are not axiomatic existences, but constructed existences, derived from multiply-connected circular action."*



CC0/Drummyfish

*"In Euclidean space, only five regular polyhedra (the five Platonic solids) can be constructed, reflecting the self-boundedness of constructability in Euclidean space."*

physics, the solar hypothesis as such is by no means original to the fifteenth century. It occurs in the *Paradiso* canticle of Dante's *Divina Commedia*, a century earlier. The ancient astronomy of central Asia, as transmitted by Vedic hymns, is indisputably a solar astronomy. Prior to Ptolemy, Greek astronomy was a solar astronomy; Plato's method would require a solar astronomy. The importance for science of Cusa's solar hypothesis lies in Cusa's grasp of the practical importance of that isoperimetric principle from which his solar hypothesis and his spherical harmonics are derived.

The elaboration of Cusa's scientific method was conducted chiefly by Pacioli and da Vinci. Pacioli prefigured the more rigorous work of Euler, in constructing a proof that, in Euclidean space, only five regular polyhedra can be constructed. Since four of these five are derived by construction from the one, the dodecahedron, it is the dodecahedron's construction which reflects directly the self-boundedness of constructability in Euclidean space. Hence, the Golden Section expresses most succinctly the limits of constructability in Euclidean space. It was the application of this elaboration of Cusa's principles by Pacioli and da Vinci, which afforded to da Vinci the entirety of his approach to scientific work: hydrodynamics, biology, wave propagation, spherical projective geometry, machinery, and so forth.

The most crucial of da Vinci's principles, is his and Pacioli's demonstration, that living processes are distinguished essentially from non-living, by the fact that the harmonics of morphology of growth and determined function of living processes is congruent with the Golden Section. After Kepler's work, and especially the work of Gauss *et al*., we must add a qualification. Excepting the maximum and minimal extremes of astrophysics and microphysics, all processes which are harmonically congruent with the Golden Section, are either living processes or artifacts of living processes. Indeed, healthy economic processes are characterized metrically by harmonic congruence with the Golden Section.

As Kepler indicates in his *Harmonices Mundi*, his construction of mathematical physics is derived from the preceding work of Cusa and da Vinci. By examining the internal features of Kepler's work, these two are the principal predecessors to which all of Kepler's own work refers most essentially. The chief debt Kepler owes to a contemporary, is to the *De Magnete* of William Gilbert, a work which is also derived from the line of inquiry elaborated by da Vinci.

In the spectroscopy of biological processes, most emphatically, the most essential fact is that these processes are characterized by an array of accessible states, corresponding to wave-lengths. Each such state is a metastable state of relatively maximum entropy for that condition, better described as a least-action state for the specification that the radiation is coherent. This is also the significance of the Keplerian orbits. By demanding, according to Cusa's and da Vinci's principles, that planetary orbits (seen as projected into a Euclidean manifold) are least-action pathways only if they conform to harmonic relations determined by the Golden Section, the beginnings of Kepler's mathematical physics is defined.

Why the orbits are elliptic, rather than circular,

could be understood only after the work of Gauss. Gauss and his collaborators showed that physical space-time is not located within the confines of the Euclidean manifold, but in a higher-order manifold, the Gaussian complex domain. Hence, the relations projected as images into the Euclidean manifold, pertain to ontological relations which exist actually only in the higher order complex domain. Yet, without yet understanding this aspect of the matter, Kepler's rigorous adherence to his principle of construction, enabled him to reach an approximate solution to the problem of the elliptic orbits.

*Johann Carl Friedrich Gauss, by Christian Albrecht Jensen.*

Kepler's flaw in this respect, was his education in music by the father of Galileo Galilei. Kepler chose a musical scale which is not the well-tempered scale, and therefore is not consistent with the harmonics determined by the Gaussian manifold, except respecting the relationship of the fifth to the Golden Section. By requiring that the harmonic ratios of the elliptic orbital velocities conform to the primary musical-scale relationships, Kepler specified approximately that the principle of the Golden Section must govern the elliptic orbits.

From this, Kepler derived his three universal laws of mathematical physics.

You and your colleagues probably know that Newton never discovered a differential calculus. The first paper on the differential calculus was presented by Leibniz to his Paris printer in 1676. The details of Leibniz's elaboration of that calculus, during the Paris interval, 1671-1676, repose as numerous pages of working-papers, in the Hanover archive. The efforts of the London Royal Society to plagiarize Leibniz, probably done chiefly by Hooke, not putative author Newton, resulted merely in an extension of previously extant work on indefinitely extended algebraic series, a matter which has no proper connection to those principles of a differential calculus as specified by Kepler and Pascal, before Leibniz.

The idea of a differential calculus is a conception peculiar to constructive (synthetic) geometry. That is, such as multiply-connected circular action generates points and lines connecting points, so all of the singularities of Euclidean geometry (points, lines, surfaces, solids) are generated. Countability, ordinal-number relationships, are products of geometric construction based upon nothing but multiply-connected circular action. Pascal's efforts to elaborate this notion of enumerability, in the working papers employed by Leibniz, already address the problem of enumerability, long before Georg Cantor's work deriving number-orderings from Riemannian-Weierstrassian geometric (trigonometric) constructions. From the standpoint of synthetic geometry, the meaning of the calculus, and its putatively deductive operations, is immediately clear.

This history of the calculus bears directly on Leibniz's establishment of economic science.

The question of measuring the internal organization of heat-powered machines, to the purpose of measuring relative technologies, must reduce to a problem of the principle of least action. Let the action supplied to the machine be measured as peripheral displacement of rotation, and the work accomplished by the action, the area subtended by that amount of rotation. Then, the action has a value no greater than the minimal amount of action required to accomplish the same work: the isoperimetric principle. The entirety of Leibniz's elaboration of a principle of least action, is derived in these terms of reference.

Put aside the differences between machines attributable to relative efficiency, of the ratio of action supplied to the least action required for the work effected. Assume that two machines of different levels of technology each have the same efficiency of this sort. Then, for machines hypothetically consuming the same energy, but with different technologies, the differences reduce to differences in energy-flux density of effort applied to production.

The uniform (least action) process of increase of energy-flux density, is expressed by a conic self-similar-spiral action, analogous to a uniformly self-similar rate of increase or decrease of wavelength of coherent radiation. In other words, the displacement effected by

isoperimetric action remains constant, but the density of such action per unit of area increases self-similarly.

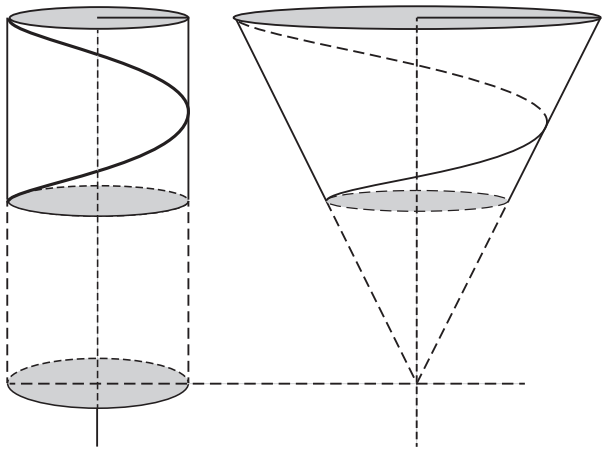
In measuring different economies, with differing levels of per-capita physical output (technologies), we make the following measurements (see the textbook, *So, You Wish To Learn All About Economics?*). Measure, first, the relative population-density (per-unit-area). We correlate this with, first, total (usable) energy-throughput per unit of relative population-density, and, second, the relative energy-flux density of the modes of production employed.

For example, it is most desirable today, to increase the modal temperature of primary production to levels above the boiling-point of tungsten. We wish to reduce any material to a plasma state, organize this plasma in an appropriate form of electromagnetic regime, perform isotope separation, and so forth. By controlling the process of "condensation," in the proper electromagnetic regime, we shall be able to synthesize ceramics of desired paracrystalline structures, while, at the same time, surpassing, in technology and in economy, all visible limits to "natural resources." We can secure such temperatures more readily through controlled thermonuclear fusion, and by powerful laser and particle-beam radiation in very high frequencies, with the gamma-ray portion of the spectrum most attractive to us.

Looking backward from such an imminently achievable sort of new technology, toward man's progress from the modes of simple "hunting and gathering," we have a clearer picture of how we must measure technology-driven economic progress up into the present time.

Looking back to Panini's principle of the transitive verb, to Plato's geometrical method, and to the relevant implications of Cusa, da Vinci, and Kepler, another crucial point ought to be obvious to us. Matter, space, and time, as distinct existences, do not exist; only physical space-time exists. Therefore, we are dealing not simply with a manifold determined by multiply-connected circular action. Each aspect of multiply-connected circular action has extension.

From the standpoint of least action, only two primary types of least-action extension are available to us: cylindric and conic. If the circular perimetric action is constant, the extension is a perfect cylindric helix, and Fourier Analysis suffices. If the circular perimetric action is increasing or decreasing at a uniform rate, then conic self-similar-spiral action prevails, and Fourier Analysis does not suffice. In each case, substitute either cylindric or conic action for circular action; construct a synthetic geometry of multiply-connected cylindrical or conical action, as we would otherwise elaborate a Euclidean synthetic geometry. In the latter case, we have the Gaussian domain.



*"Only two primary types of least-action extension are available to us: cylindric and conic. If the circular perimetric action is constant, the extension is a perfect cylindric helix, and Fourier Analysis suffices. If the circular perimetric action is increasing or decreasing at a uniform rate, then conic self-similar spiral action prevails, and Fourier Analysis does not suffice."*

Doubly-connected conic action suffices to generate a new kind of singularity, distinct from the common singularities of Euclidean space. This singularity occurs in the form of an hyperbolic discontinuity within a Weierstrassian continuous function. The continuity of the densely discontinuous function can be preserved in a triply-connected conic manifold, as the work of Dirichlet and Weierstrass is resolved in principle by a Riemann surface.

Such ordered (Weierstrassian) discontinuities are the crucial distinction between the phenomena of Fourier Analysis and the Gaussian domain.

The characteristic (metrical) feature of such a Gaussian domain, is twofold. First, the Golden Section in the Euclidean domain is the metrical characteristic of conic self-similar-spiral action projected into that domain. Second, the positive ordering of elaboration of a Gaussian manifold is metrically characterized by increasing density of the number of singularities (discontinuities) per chosen interval of action. Increasing such density is the proper measure of negentropy; decreasing such density, is the proper measure of entropy.

This bears in the most obvious way on Pacioli's and da Vinci's definition of the characteristic harmonics of

living processes. We draw a line of progress, from da Vinci, through Pasteur, into present advances in optical biophysics. (This is very important for China. Some of China's scientists are contributing important work on this; it is obviously a matter of importance to China's specialists working on space-research planning, as well as necessary work toward combatting the deadly explosion of old and new varieties of pandemics, both spontaneously and as measures of biological warfare.)

For related reasons, it is the most crucial aspect of economic processes.

In physical science, we have a circumstance paralleling the state of affairs in economics. Fundamental scientific progress came to a halt during the 1860s and 1870s, in the form of the work of such figures as Riemann, Weierstrass, Beltrami, and Cantor. There has been much scientific progress in the form of extended application of principles discovered into approximately the 1870s, but very little in matters which can be called properly "fundamentals." This state of affairs is not accidental, but is the consequence of deliberate policy. The parallel to the case for economics is not a perfect one, but the parallel exists nonetheless.

In modern mathematics, as distinct from the experimental practice of physics, we have two opposing, ultimately irreconcilable factions. The one faction is the current I have summarily described here: the standpoint in synthetic geometry typified by Cusa, da Vinci, Kepler, Leibniz, and so forth, through the Göttingen faction of Gauss, Dirichlet, and Riemann. The opposing faction, typified in the extreme by Leopold Kronecker and the neo-positivists, bases itself on the notion of an axiomatic arithmetic. The latter faction is typified historically, by Francis Bacon, Descartes, Newton, Hume, Laplace, Cauchy, Kelvin, Maxwell, Helmholtz, Boltzmann, and so forth. The formal differences as to mathematics, constructive geometry versus axiomatic arithmetic, are expressions of differences in axiomatic ontology. To the former, the "elementary particle" is a generated singularity within a Gaussian manifold; to the latter, axiomatically existing "elementary particles" of some kind, such as "quarks," are assumed to be the building-blocks of a quasi-Cartesian sort of physical space.

From the first standpoint, my own, it is commonplace to hear or read a presentation of very valuable experimental work, in which the theoretical-mathematical explanation offered is an obnoxious superimposition of bad ideology on good experimental work. It is my advantage, to participate in seminars on plasma physics, biology, and so forth, involving guest lecturers presenting their work to seminars composed of specialists from several countries. By aid of this, I have the strong impression that much of the time spent in the name of scientific work today, is wasted in the attempt to justify results of experiments in terms of a widely accepted but essentially useless ideology. Terrible ontology, reinforced by terrible sorts of highly popular mathematics, is made the master, and the experimental subject-matter degraded to a poor slave assigned to dance the tunes played by reductionist ideologies of mathematics and ontology.

Perhaps I do not exaggerate in estimating that perhaps 90% of the efforts of otherwise useful scientists are wasted in such ideological exertions. Certainly, published scientific papers are about 90% useless ideological ritual, included perhaps to propitiate the journals' referees, with a very small part of the paper devoted to the useful material actually prompting the report.

For sundry reasons, most of the recent twenty years of my life has been occupied, increasingly, with the effort to establish a just sort of international economic order, ensuring rapid and voluminous transfer of capital-goods technologies to developing nations. Were I a prophet, I would predict nothing but doom for most of humanity, in a world continuing to plunge ever-deeper into the new dark age now in progress. Since I am optimistic in practice, and despise prophecy, I assume that somehow we shall respond to the worsening global crises by adopting a just sort of new international economic order. Assuming that, I assume the problems with which such success would confront us, including the problem of mass-education of populations of developing nations to the levels needed for efficient assimilation of needed technologies.

This confronts me with a fact which is both unfortunate, and yet advantageous. The unfortunate thing, is that the present educational systems of Europe and the Americas are abominations I would not wish to impose upon developing nations. Even during the happier days of the 1930s through the 1950s, in the U.S.A., our educational system was a bad one, although infinitely better than what exists today. The advantage is, that developing nations can save much time and effort of their teachers and students, by adopting the principles of education specified by the great Wilhelm von Humboldt, and basing the content of primary and secondary education

on a combination of the classics and a prescientific program grounded in an experimental outlook informed by synthetic geometry.

The synthetic-geometrical way of thinking, is already, by implied definition, an experimental scientific approach. The isoperimetric principle locates the irreducible in action, in transformations within physical space-time. So, such geometrical ideas, instead of being abstract mathematics, as mathematics based on axiomatic arithmetic are, are implicitly ideas of constructing experiments. Professor Felix Klein would not permit a student to graduate from Göttingen, unless the student could render a mathematical formulation efficiently as a geometrical construction. Today, that invaluable bit of discipline is abandoned. We produce, therefore, mathematicians who can not imagine, physically, what reality their formulations are supposed to address; abstract deduction of this empty, nominalistic sort, is often viewed as a substitute for physics.

This nominalistic sort of academic thinking in "the West" is symptomatic of the pathological morality pervading much of the OECD nations' policy-making. For example, if I impose sufficiently harsh austerity upon developing nations, I am responsible for the mass-murder, through famine, epidemics, and bloody social convulsions, which such a policy must surely bring about. The "western" academic, does not consider the practical consequences of a policy the measure of its rightness or wrongness; he will argue that he is merely defending a "sound monetary theory," and will, at most, express regret that so many deaths are the necessary price of applying "generally accepted monetary theory." I see it as a kindred sort of academic immorality, that one could follow a pathological sort of "accepted" mathematical-ontological dogma, without regard to the consequences of such dogma's influence on the state of humanity generally. A sound theory must be measured by its consequences for practice.

In this respect, the morally pathological character of presently accepted, monetarist political-economy dogmas, and the pathological character of rejecting the geometrical foundations of modern european science's contributions, are symptomatic of the same cultural disorder within "western civilization."

China—and other developing nations—should accept the viable aspect of european culture's contributions to humanity, but must not mistake "european culture" as its presents itself, as something which must be swallowed whole in order to gain the advantages of european technology.

## My Contribution to Economics

In the main features, my economic science is merely a continuation of the American System of political-economy, a continuation informed by Leibniz and so forth. In most points, nothing I propose would differ much from what Leibniz, Alexander Hamilton, the Careys, or List, would propose could they view our situation as it is today. To this knowledge I have obtained from my predecessors, I have made only one contribution. Identifying, summarily, the nature of that contribution, will be helpful in assessing my observations on the "spill-over" impact of SDI research.

Despite the preliminary steps toward measurement of technology effected by Leibniz, I find no record of any effort to calculate a measurable relationship between technological progress and increased rates of economic growth until my own inquiries of the 1948-1952 period.

I was provoked to undertake this, beginning 1948, by my enraged reaction to a leading feature of the work of Professor Norbert Wiener, his Boltzmannian dogma of "information theory." The argument, that human creative contributions to advancement of technology, are of the form of "negentropy," I had already settled in my own mind by that time. I could not tolerate the folly of defining "negentropy" in terms of Boltzmann's dogma of statistical fluctuations. To me, the obvious point was, that a negentropic process must be a kind of continuous process which generates a discontinuity, requiring a reformed formulation of the process at that point, to continue the process to the generation of the next discontinuity.

This led me through a variety of exploratory pathways, which curiously, but not accidentally, led me through the work of Cantor, and from the vantage-point of Cantor, to a correct view of Riemann's work.

In the course of this work I became an economist, partly because I was already a management consultant, and also because the question of technological progress seemed to me the most suitable vantage-point from which to define useful forms of creative innovation by the human mind. It also appeared most appropriate, to correlate increases of the productive powers of labor with increases of the usable levels of per-capita energy-throughput, and to define technological progress in those physical terms of reference. Once the approach to

a solution had been formulated in those terms, the remaining challenge was to discover the standpoint in mathematical physics best suited to state the proposition as I had hypothesized it. From that, the course of inquiry went via Cantor to Riemann.

I think that there are three points on my contribution to economic science to be stressed in this letter. Two of these three are elaborated at some length in the textbook, so that I need only describe them briefly here. These two are, respectively, (1) the mode through which technological progress effects a general increase of the productive powers of labor, and (2) the function of basic economic infrastructure as the most general form of capital investment in production. The third point, (3) technological progress expressed as a continuous function, is not suited to be regarded as "elementary," and, for that reason, is not elaborated in the textbook. It is referenced sufficiently in the copy of the *EIR* treatment of Leontief earlier forwarded to you, that I need add no more than a few remarks on that here.

(1) The mode in which production at one level of technology produces a mode of production at a higher level of technology, is the production of capital goods, especially capital goods of the machine-tool class. The rate of technological progress is determined, not simply by the increased margin of capital-goods added to capital-intensity of production, but also by the process of replacement of relatively obsolete capital goods by capital goods of relatively more advanced technologies.

Obviously, the turnover of replacement capital goods, in and of itself, would chart a path of diminishing gains, as the relatively most modern technologies replaced more and more of the relatively obsolete capital-goods stocks. This would be the case, unless the average level of technology of newly produced capital stocks were advancing on the average.

Hence, in the simplest aspect of the matter, we have the following variables to consider: (a) The rate of increase of the level of capital-intensity, relative to the existing level of capital-intensity; (b) the rate of advance of technology of currently produced capital goods, relative to the average level of technology of capital goods already in use.

This works to the effect, that as the percentile of total production devoted to capital-goods output increases, the gain in average productivity caused by a finite amount of advancement of technology is increased. The greater the capital-intensity of production as a whole, the greater the relative increase in average productive powers of labor caused by introduction of some more advanced technology.

The advancement in combined capital-intensity and technology must correlate with increases in the per-capita usable energy-throughput, and with a general tendency for increase of the modal energy-flux density of production.

(2) Basic economic infrastructure (water-management, production and distribution of energy, general transportation, sanitation, communications, and basic social services of health and education), is the most fundamental form of capital investment in productive potential. For example, over the post-war period, the rate of increase (or decrease) of levels of U.S. investment in basic economic infrastructure, correlates almost exactly with the resulting increase or decrease of U.S. productivity, by a delay-factor of between 12 and 18 months. The required investment is a function of level of technology to be reached, population, and inhabited area. Economies with relatively higher population-densities require less energy per-capita, to sustain equal levels of technology and productivity, than economies with relatively lower population-densities. Cost of basic economic infrastructure increases (relatively) with area per unit of population-density. So, for example, Japan's very high population-density means that it requires less energy per-capita for its level of productivity than the less densely population Federal Republic of Germany, and the Federal Republic of Germany less than the United States.

I have watched discussions of the issue of China's investment in basic economic infrastructure, between representatives of China and Japan. On this point, the representatives of Japan are emphatically correct. I acknowledge the two kinds of objections raised on this point by representatives of China. More profound, of course, is the policy-issue: what would such shifts toward capital-intensity do to the traditional culture of China? Less cultural, and more technical, is the question: Whence can China secure the resources on the scale needed for a more generalized development of basic economic infrastructure? Technically, the difficulty is overcome far more easily than most experts from OECD nations would imagine. The chief problem is not technical; the chief problem is that this would require technological advances in China's agriculture sufficient to shift a significant portion of the labor-force from agriculture into infrastructure-building in a capi-

tal-intensive mode. I think that only the cultural impact of such measures is the truly serious problem to be considered; technically, the problem is solvable, especially if a just international economic order were established to assist this.

Personally, I am involved to one degree or another in promoting a range of major basic-infrastructure projects, especially some urgently needed by the developing sector: water management projects, a few major canals, and power systems, are my chief concerns. I support, in principle, the idea of a Global Infrastructural Fund, as proposed since 1977 by the Mitsubishi Research Institute. I stress, that if we adopt construction of several large-scale projects, benefitting a large number of nations, the economies of scale and of efficient use of equipment mean that the cost of such projects to each particular nation are greatly reduced, probably to between half and two-thirds the cost were each nation's projects done in isolation.

CNSA

*An artist's concept of the lander for China's planned* Tianwen *mission to Mars, which also includes an orbiter and a rover, and is scheduled to be launched in July.*

(3) The mathematical representation of technological progress in a capital-intensive, energy-intensive mode, is essentially defined by doubly-connected conic self-similar-spiral action. This generates hyperbolic discontinuities. A continuous function of this sort, generates such discontinuities (singularities) at a harmonically ordered, increasing rate. This continuous function is fully connected in a triply-connected-spiral (hyperspherical) domain, the whole process corresponding to a Riemann Surface. The ordering of such a continuous function, may be measured as increasing density of such discontinuities (singularities), which is a measure of increasing relative negentropy.

Concretely, as I have indicated in sources at your disposal, if we may presume that the plunge into a new dark age is soon aborted, the coming fifty years will be dominated by elaboration of three distinct but coherent frontiers of present scientific progress: (a) Controlled thermonuclear fusion, (b) Coherent electromagnetic pulses of directed energy, and (c) Optical biophysics. The characteristic application of these three combined technologies, is the undertaking of the colonization of both the Moon and Mars, with the colonization of Mars to be begun approximately a quarter-century hence, and the colonization of the Moon, already feasible on principle, to be begun during the 1990s.

All other varieties of advances in technology, such as advances in computer technology (parallel processing, optical-analog/digital systems), should be classed as auxiliary technologies, auxiliary to applications of the three primary technologies cited.

Controlled thermonuclear fusion, is necessary for continuously powered trajectories of spaceflights by flotillas over interplanetary distances, and is necessary to supply power for colonization on Mars. Coherent radiation of very high energy-flux densities represents a class of tools indispensable for "earth-forming" of the Mars environment, for example. Optical biophysics is a tool indispensable for extended spaceflight and for human needs on other planets.

If we can construct new cities on Mars, then we can more easily employ the same technologies to construct rich habitations in such deserts as the Sahara and the Gobi. In general, the application of space-exploration technologies to tasks of production and life on Earth, is a very obvious connection.

Apart from the fact that we have concrete scientific-economic needs to proceed with space-colonization, the creation of taskforces which must solve each and all of the problems of spaceflight and space-colonization, in a coherent way, forces mankind to make scientific breakthroughs at a much more rapid rate than would otherwise occur. Science requires a concrete task-ori-

entation, which focuses the powers and self-development of science on those kinds of practical objectives which require development of the principal frontiers of scientific inquiry.

The simplest illustration of the economic importance of colonization of space, is the fact that certain problems of physics in general require acceleration of astrophysics. This requires extensive exploration of the total range of the electromagnetic spectrum. This requires not only orbiting telescopes, but also elaborate scientific observatories in space, including space-stations out of the noisy vicinity of Earth and the Earth's orbit. These stations must be maintained; the population of scientists and technicians required in space will be significant.

The general significance of this exploration, is that the extremes of astrophysics, microphysics, and optical biophysics, are the so-called "force-free" domains of physics. It is such, that mastery of microphysics demands inquiry into the matching features of astrophysics. (I find it most rewarding, to bring astrophysicists together with plasma physicists and biologists, for seminars on various topics. Rarely does one meet a topic which is not better mastered by aid of the interaction of such varied specialists, than if one type of specialist were omitted. It is stunning, to note how much the fundamental questions of astrophysics, microphysics, and optical biophysics resemble one another in a principled way.)

Taking only the first two of the three primary technologies, for purposes of illustrating the point, the increase of the modal temperature of primary processes, to levels above the boiling-point of tungsten, is the crucial pathway for advancement in primary technologies of manufacturing. Such regimes can not be mastered adequately, except by aid of coherent, directed radiation at very high energy-flux densities. It is most conservative to estimate, that such a shift would mean the increase of the productive powers of labor by more than an order of magnitude above present levels in OECD nations. By assigning ourselves the mission-orientation of relatively early colonization of the Moon and Mars, we force ourselves to develop those qualities of technologies at the most rapid relative rate.

Essentially, the creation of the machine-tool industries needed for successive steps of the space mission-assignment, produces as a by-product the machine-tool capacity which supplies the same advances in technology to production of capital goods more generally.

In summary of this point, the issue is not one of formulating merely some general mathematical theorem respecting the measurable connection between technological advances and economic growth. The issue is to adduce, by aid of such approaches to measurement, the specific measures of development which face society for the decades ahead.

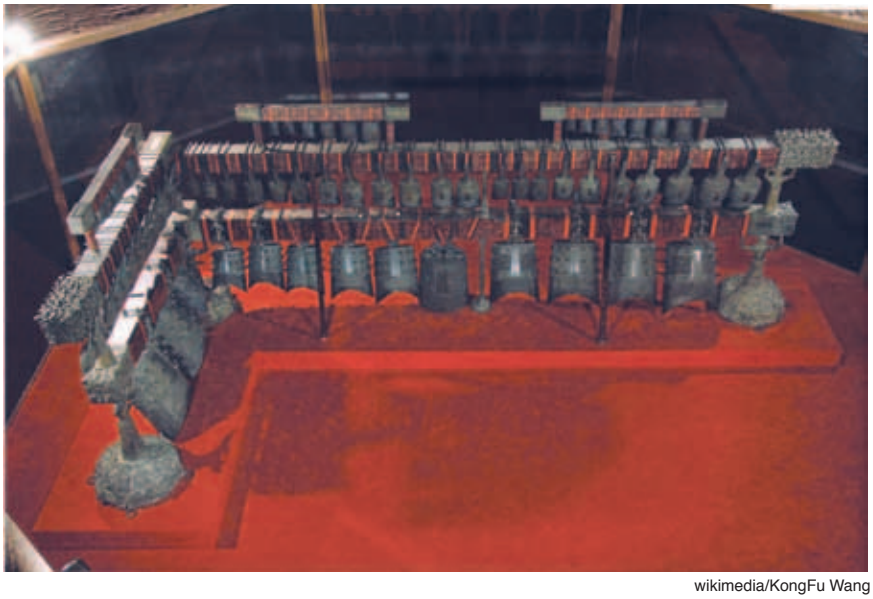
## B. European & Asian Cultures

### 3. Common Roots of Civilization

Bal Gangadhar Tilak's famous books, *The Orion* and *The Arctic Home in the Vedas*, touch most efficiently the question of whether or not there exists a common origin for the development of the cultures of western Europe and central and southern Asia. The theses of these two books, is premised on the work of european astrophysicists, from Kepler through the contemporaries of Carl Gauss, in studying the ancient solar-astronomical cycles transmitted to modern knowledge through the Vedic literature. These cycles include the long equinoctial cycle, the long individual and compound cycles for the geodetic and magnetic north poles, and other very long cycles.

The Vedic oral traditions, defining the equinoctial cycle, date from the period the equinox was in Orion, and are thus dated without question from earlier than 4,000 B.C. The comparison of the related Vedic and Avestic literature, shows that the cycles were based on an earlier Arctic constellation, almost certainly dating from the interval during the last Ice Age, when the Gulf Stream's warming of the Arctic sea made that region habitable for a maritime culture, while fostering the deposit of glaciation on the adjoining continental landmasses.

During the Orion period, prior to 4,000 B.C., the site of the relevant culture was central Asia, a period preceding that progressive aridization of that region promoting the Aryan and other migrations from the region. The musician Yehudi Menuhin's report of a set of well-tempered-tuned bells in China, dating from *circa* 1,000 B.C., is properly seen as relevant to the implications of Tilak's thesis. The evidence pointing to the musical intonations of ancient languages of China, and the evidence of both the sung values of ancient Vedic as well as classical Greek, is also a part of the relevant evidence.



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*"The musician Yehudi Menuhin's report of a set of well-tempered-tuned bells in China, dating from circa 1,000 B.C., is properly seen as relevant to the implications of Tilak's thesis." Here, one of several such tuned sets of ancient bells, played as a musical instrument, excavated in 1978 from the tomb of the Marquis Yi of Zeng (died circa 430 B.C.).*

The ancient construction of a solar astronomy consistent with the Vedic, is very easily examined. If one constructs the simplest sort of daily solar observations, and compares the daily observations of the morning, midday, and evening positions of the Sun with the corresponding night-time positions of the constellations, an accurate annual solar calendar is easily constructed, and, with slightly greater, more prolonged effort, the equinoctial progression is also adduced. The construction of reasonably accurate calculations of long cycles requires only the existence of durable urban sites, and, preferably, a maritime culture as the point of original development of the culture conducting such observations.

The existence of maritime, quasi-urban and urban culture, preceding the "agricultural revolution," is adduced readily. The human organism requires not only a nutrition equal to the output of the average member of a society; there is a minimal input-output level, approximately 1,800 to 2,500 calories per day, with between 3,000 and 5,000 calories per day for heavy labor by the young adults. Especially in so-called primitive societies, the amount of per-capita effort required to obtain a minimal nutrition, is precarious. The only mode of "hunting and gathering" existence which permits adequate ratios of nutritional input to the output required for this nutrition, to the degree permitting relatively higher population-densities, is fishing near the mouths of major river-systems. Such modes of "hunting and gathering," permit a quasi-urban density of fixed or semi-fixed population centers.

I need only mention here, the transitions from river-mouth, to coastal fishing, and to ocean fishing. The expansion of a network of both temporary, seasonal, and permanent quasi-urban sites of a fishing-based culture, establishes the preconditions for beginning of an "agricultural revolution." Egyptian accounts cited by Plato, and the Diodorus Siculus chronicle, date the agricultural revolution as introduced into the Mediterranean by a maritime culture, to earlier than 10,000 B.C. The latest evidence to come to my attention, establishes that archeological finds of cultivated varieties of seeds have been dated to *circa* 8,000 B.C.

It is the general indication, that the development of oceanic maritime culture produced the agricultural revolution, and, out of this, urban-centered riparian agricultural societies at the mouths of major river-systems. This included active trans-Atlantic and trans-Pacific forms of maritime culture, as archeological evidence in the Americas richly attests. Although well-developed maritime cultures persisted late into the second millennium B.C., both trans-Atlantic and trans-Pacific maritime culture generally appear to have suffered a series of catastrophes, prior to and during that millennium. As a result of these catastrophes, the history of mankind shifted, for a prolonged period, to revivals of technology based upon urban-centered agricultural society. This was most emphatically the case, after the extensive "dark age" from the latter portion of the second into the early portion of the first millennium B.C.

The correlations between the solar-astronomical long cycles, transmitted through the Vedic, and the system of megalithic (paramagnetic rock) astronomical observatories constructed by the northern european "Peoples of the Sea," is of crucial importance for us today. We know the general methods used for constructing such solar-astronomical tables by naked-eye observations. We know the general conditions of life of an urban or quasi-urban culture needed to conduct ob-

servations to such effect. Therefore, the internal features of Vedic solar astronomy provide us the best means to estimate the nature of the culture which produced such astronomical tables, and also afford us some insights into the organization of mental life within such culture.

The last Ice Age, was produced chiefly by the movement of the Gulf Stream into the Arctic Ocean, leading to a special kind of habitable conditions in that region during part of the intra-glacial period, and also prompting the accumulated deposit of glaciation upon the adjoining land-masses of Eurasia and North America. The other climatic feature of the period, was the general melting of the glaciation, from about 17,000 B.C. to circa 4,000 B.C., with some significant adjustments, and tectonic correlatives, into the second millennium B.C. The best archeological sites from the period prior to 4,000 B.C. are undoubtedly former coastal sites buried today under hundreds of feet of water and silt. During 6,000-4,000 B.C., it is most probable, rather ideal conditions existing for a culture in central Asia, followed by the progressive aridization of that region, as also the Arab peninsula and increased desertification of regions of the Sahara. This leads into the waves of Indo-european and other migrations from Central Asia, into Europe and southern portions of Asia, the new feature of the period beginning during the third millennium B.C.

The migrations into China, up to about 1,000 B.C., are largely a mystery to me. We have indications, such as the migrations of the Thai into southern China and Southeast Asia, but the general picture is largely unknown. We have a much better picture of the Middle East and Subcontinent, with the Sanskrit providing the best-documented record. Close examination of crucial features of the Sanskrit record, provides us a point of reference for efforts to reconstruct a picture of developments in other parts of Asia. The evidence needed has existed, in the greatest part, since work of the nineteenth century. The problem, the obstacle, has been, the european efforts, such as those of British archeology, to "prove" that civilization began autochthonously at Sumer and Ur, and to prove a Mesopotamian, rather than Egyptian, origin for Mosaic Judaism, has caused most of the accepted yardsticks of european archeology to be deliberate frauds.

We know, that by the middle of the third millennium B.C., the Vedic invaders of the subcontinent encountered an advanced, but degenerate form of civilization among the black-skinned Dravidians: so-called "Harappan" culture. This latter was an urban-riparian-maritime culture, covering most of the area of present-day Pakistan and western India and Ceylon, with such foreign colonies as the "black-headed" (i.e., Dravidian) rulers of Sumer, and both Sheba and Ethiopia. Herodotus insists, and there is excellent evidence in support of this, that the ancient Phoenicians (the Philistines), were also a branch of "Harappan" culture. We also know two other crucial facts about the "Harappans": their religion, and the fact that, in opposition to the solar-astronomy of the Vedic, they adopted a lunar astronomy.

Their religion was the worship of the mother-earth goddess Shakti, and her Osiris-Dionysos-like son-consort, the phallus-god Siva. The portion of the Semitic populations migrating into Mesopotamia and Sheba-Ethiopia, were indoctrinated in lunar astronomy and the cult of Shakti, She is known in Chaldean as Ishtar, in Sheban as Athtar, in Philistine as Astarte, in Phrygian as Cybele, and in Egypt as Isis. She is also the Phoenician-Roman Venus. Similarly, there is the equivalence of Siva-Osiris-Satan-Dionysos, and Horus-Apollo-Lucifer. Relics of this controversy persist within India today, in the conflict between the Vedantist and Saivist factions. In the Middle East and Europe, relics of the Shakti cult are recognized as Gnosticism and Sufism, and the spread of the Chaldean cult of astrology.

The essential conflict, which took the form of a conflict between the Sky-God (of solar astronomy) and Earth-Mother, is easily recognized in terms of the three canticles of Dante's *Commedia*. Man has two natures, a lower, beast-like nature, and a higher, divine, nature. In his lower nature, he is an irrationalist hedonist, driven by blind instincts, like a lower beast, and is a credulous worshipper of magic and related superstitions in religion. In his divine nature, man is a creature endowed with the potential for reason, a potential exemplified by the capacity for scientific progress. Although we are each mortal, if we develop and employ our potential for reason, we are capable of making contributions to knowledge and improved practice which benefit present and future generations. In a good society, these benefits endure indefinitely, such that all present generations stand upon the foundations established by preceding generations.

On this account, society and culture are properly universal. Individual sovereign nations must exist, but such nations, properly composed, are individual parts

of society as a whole, each making some special contribution to humanity as a whole. Through such contributions of one society to another, society and culture have a common universal basis.

This common basis will become most clear, in practice, when nations join efforts for the exploration and colonization of nearby space, each nation, and representatives of each nation, contributing to a common practical aim and effort of all mankind.

Man, in the condition prescribed by Shakti-Ishtar-Isis, is man in the condition which Dante describes in the *Inferno* canticle of his *Commedia*. Man, in the opposite condition, is man reaching to the outlook of the Paradiso canticle's, concluding, empyreal canto. Man, culturally still half-beast and half-divine, is the man of the *Commedia*'s (Kantian) *Purgatorio*. This is another, accurate and appropriate, way of viewing the conflict within european culture, which I summarily described earlier.

I refer you to a second item in the edition of *The Campaigner* forwarded: Dr. Muriel Mirak's dialogue on the subject of the musical ordering of vowels and consonants in language. This I recommend as a point of reference for further work by the philologists of China.

As part of a pedagogical exercise, for introducing conceptions of Gaussian-Riemannian physics to a broader audience, some years ago, I proposed to my collaborator, Dr. Johnathan Tennenbaum, that he elaborate the construction of well-tempered polyphony, in terms of stereographic projections of a conic self-similar-spiral action. Dr. Mirak's study of the conic ordering of tonal shifts in vowels and consonants, is an outgrowth of the fusion of the results of Dr. Tennenbaum's project with an exhaustive study of Dante's Italian from the vantage-point of an hypothesis on the construction of language which I proposed to my collaborators among philologists during that same period.

We have also noticed that some of the features of Thai sometimes assumed to be reflections of the Vedic influence on Southeast Asia, must be viewed as reflections of Thai's origins in China. The point is, I am certain, that if we could reconstruct an estimated evolution of the languages of China back toward about 3,000 B.C., we would find certain connections to the Vedic through a common cultural interaction in central Asia. The set of well-tempered bells, dated from circa 1,000 B.C., point in such directions. The conic ordering of tonal shifts, outlined in Dr. Mirak's dialogue, would be the key to such a study.

There are two conventional approaches to the study of well-tempering. The one approach is historical; the other biological.

Al-Farabi, in the tenth century A.D., the putative designer of the well-tempered octave scale, stated that well-tempering was already very ancient at that time. The attack on well-tempering by Aristotle's circle, shows that well-tempering was well established by the time of Plato.

From a practical musical standpoint, the necessity for well-tempering in polyphony is readily demonstrated. Polyphony is an outgrowth of ancient sung prosody, which depends upon both metrical and harmonic development of musical material. In order that the notes of the scale, in different keys, be in agreement, well-tempering is required: otherwise, polyphony is impossible. This ordering happens to coincide with the stereographic projection of conic self-similar-spiral action.

The question is then posed: What is the significance of well-tempering from the standpoint of the physiology of singing and hearing? This was fought out between the adversaries, Riemann and Helmholtz, during the nineteenth century. Modern studies of the physiology of brain functions of perception, as assisted by researches in optical biophysics, settle the question absolutely in Riemann's favor.

The physiology of vision is such, that the human brain does not see precisely the world as it is. Rather, the brain constructs a correct set of values for the topological characteristics of perception. The brain appears to reduce the images to a Euclidean stereoscopic form, but what it actually accomplishes is to stipulate the topology of perception in terms of a Euclidean manifold of reference. In other words, the brain does not present us with an image of the world as it is, but rather the brain is a very sophisticated scientific instrument. Vision is well explored, but the implications for hearing, including the physiology of the ear, show that the same principle applies. The fact that scent is essentially electromagnetic, rather than "chemical," has been well established; this casts light on the evolution of the visual and auditory cortex from the olfactory cortex.

A correlated bit of evidence is obtained from study of the bel canto method of singing. "Noisy" excitation of sounds from the throat are projected into the tissues of the upper region of the head's air cavity, to the effect that the emitted tone is relatively coherent, in contrast to the "noisy" quality of the throat tone. So, a trained bel canto singer's tone can break glass at a distance without perturbing the flame of a candle held before the singer's

mouth. The process of generating an emitted bel canto tone, is comparable to the functioning of a laser.

This correlates with the point, that sound is transmitted not as percussive interaction among air molecules, but is an electromagnetic propagation. That is, the rate at which the air medium may be induced to become transparent to the transmission of the electromagnetic radiation of sound, is potentially retarded by the average velocity of the air molecules, since the molecules can not assume the required configuration for induced transparency at rates in excess of the average velocity of movement of molecules. This view of the radiation of sound was already insisted upon by da Vinci, who defined acoustical shockwaves in these terms of reference. Leonardo's thesis was proven by Riemann, in the latter's famous "shock wave" paper, "On the Propagation of Plane Air Waves of Finite Magnitude," which provides the first modern statement of the principle of isoentropic compression, as applicable to such included matters as transonic flight and ignition of thermonuclear fusion.

A more profound basis for this line of inquiry, is provided by optical biophysics.

The principles of nature are universal, and so is the challenge of the individual human condition. On this account, all proper culture has a common basis. For related reasons, this must be extended to the universal principles underlying the most literate form of different languages. What of aesthetical principles?

Following the publication of Immanuel Kant's *Critique of Judgment*, Friedrich Schiller was obliged to launch a comprehensive refutation of Kant in Schiller's *Aesthetical Letters*. The circumstances of that controversy were, briefly, as follows.

Under Queen Anne, there was a plot afoot to appoint Leibniz the Prime Minister of England. This provoked the attack on Leibniz in England, by the faction allied with the Duke of Marlborough. The famous Leibniz-Clarke correspondence is a reflection of that political circumstance. A general attack on Leibniz was unleashed, centered in the Calvinist bankers of Geneva-Lausanne and the Jesuit order in France. At the center of this were such figures as the Swiss-controlled Voltaire, and David Hume. Immanuel Kant, the son of Scottish Pietist immigrants to Germany, was Hume's leading tool in Germany for the attack on Leibniz, up to the point that Kant broke conditionally with Hume, when Hume shifted his point of view toward the hedonistic irrationalism of Smith, Bentham, and the "nineteenth-century British philosophical radicals" also known as "nineteenth-century British Liberalism." In the *Critique of Judgment*, Kant's Humean side reappeared in full force.

Not only did Kant insist, as he always had, that scientific creative thinking *a priori* was not rationally orderable. He insisted, as Friedrich Carl Savigny did later, that moral and aesthetical ideas were purely arbitrary conventions of the "*Volksgeist*," that no rational principles governed the discrimination of beauty.

At that time, Schiller was the intellectual leader of the principal republican conspiracy in Germany. Although the leading and most popularly influential German republican of that period, he was constrained by the general decisions of his fellow-plotters of the Weimar Circle. The fellow-plotters had decided to draw Kant into their circle, and insisted that Schiller treat Kant as kindly as possible. So, it was politically imperative that Schiller tear the mask from the most dangerous features of Kant's influence, but politically obligatory that he do so in the gentlest, academic sort of language. Hence, the *Aesthetical Letters*.

I refer back to Pacioli's and da Vinci's proof, that living processes are harmonically congruent with the Golden Section. Classical Greek art, such as the design of the Athens Acropolis, was based on the principle that only those divisions of the circle congruent with the harmonic proportionings of living beings, especially human beings, represented beauty. In is easily shown, that the best classical poetry and music, are based on metrical and harmonic principles congruent with the harmonics of the Golden Section.

That which expresses the principle of life, over death, negentropy over entropy, is the essence of truth and beauty. The generation of singularities, in the elaboration of this principle's application, is the creative aspect of artistic composition. The generation of singularities, within a continuous function, for the case of economic development in a technology-intensive, capital-intensive, energy-intensive mode, is a human creative activity which has all of the essential qualities of truth and beauty. The mastery of solar astronomy is also the creative service of truth and beauty. The uplifting of man, from the bestial to the divine state, as in Dante's *Commedia*, is the essence of artistic truth and beauty. Reason is beautiful, especially reason in its creative modes. Whereas, the arbitrarily, irrationally sensual, is entropy, and ugliness.

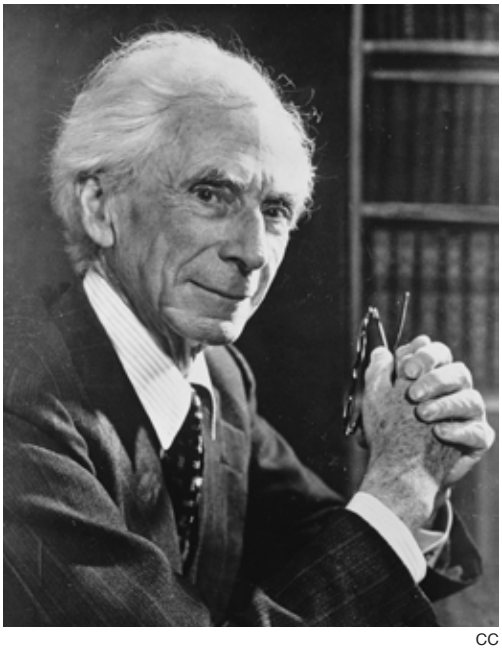
One of the worst errors of Islam, is the prohibition

against depicting living figures, the prohibition of beauty. Yet, perhaps worse, is the substitution of polymorphs and human and animal figures drawn or sculpted in such a manner as to defy the harmonic principles of the Golden Section. Perhaps this is the ultimate in ugliness.

China is a sovereign nation, and thus, by my notions of law, has the right to order its own internal affairs. So, although I insist that we have all the same culture, at root, China may respond to my view as it chooses to do so.

The point of this letter is to be more emphatic on another aspect of this issue of culture. How shall China assess european culture? I wish to insist, as I have done, that there are two conflicting, irreconcilable cultural currents in Europe and the Americas: the one, the republican tradition of the Golden Renaissance, to which I hold myself accountable, and the opposing, oligarchical, current, which the United States fought in its two wars against Britain, the oligarchical culture of the triumph of feudal reaction at the 1815 Congress of Vienna.

If you take from us, the best which the republican culture has produced, China will suffer no harm, but only benefit from that. For the other features of european culture, I suggest that you abhor and reject those.



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*Bertrand Russell in 1957.*

## 4.
## 'New Yalta'

As the leadership of China is more or less fully aware, during the middle 1950s the Anglo-American Liberal Establishment reached certain conditional agreements with the government of N.S. Khrushchev. These were the agreements which had been proposed by Bertrand Russell, and such close collaborators of Russell's as Leo Szilard. These were known chiefly as agreements on principles of "nuclear deterrence," and included the avowed intent to re-divide the political map of the world, principally between the Anglo-American Liberals and Moscow. There was also, already, the intent to establish a congruent agreement with China, with the view (in London and New York), of China's playing a third-party role in a future game of "crisis management" involving the two principal powers.

The proposed "New Yalta" redrawing of the strategic spheres of influence in the world, is presently in progress. The Anglo-American Liberals pushing for settling "regional matters" to this effect, see the redrawing of the map, to Moscow's great relative advantage, as now in progress. They foresee a temporary expansion of the hegemony of the new Russian empire, followed by internal decay of that empire, and foresee China as playing a more crucial third-party role in the balance of power game a generation or two ahead. Naturally, Moscow intends to cheat the liberal "useful fools," once their usefulness is exhausted, and the Anglo-American Liberals are cheaters by instinct.

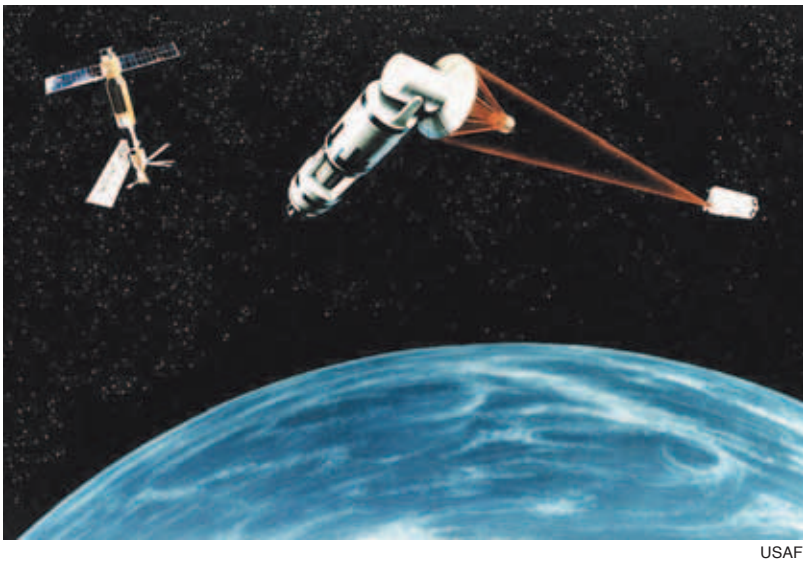
Russell set forth the general outline of this design during the early 1920s, after his return from a period in Shanghai. Russell proposed a system of world government, modelled upon the Mesopotamian and Roman empires of the past: a "*Pax Romana*" of this sort. During World War II, this scheme for world government was slightly altered, beginning Eugene Wigner's and Leo Szilard's drafting of the letter which they induced Albert Einstein to sign and transmit to President Roosevelt, proposing the atom bomb.

It might appear to some that Russell's faction was contradictory, in proposing the atom bomb (when Bohr had informed them that Hitler had killed the German A-bomb project), and then leading the campaign against thermonuclear weapons after the war. There was no inconsistency, as Russell's item in proposing preparations for preventive nuclear war against Moscow, in the October 1946 *Bulletin of the Atomic Scientists* attests. The purpose of Russell's cronies, in proposing the A-bomb, in dropping it upon Japan, and then in proposing "nuclear deterrence," was to make war so horrifying that the world would accept world government as the alternative to war.

They are not opposed to war. They have unleashed famine, epidemic, and bloody chaos among the developing nations generally, and fully intend to supplement this with biological warfare against the "non-Anglo-


EIRNS/Stuart Lewis

*Lyndon LaRouche, presenting his concept of a Strategic Defense Initiative to an audience of 600 at a conference in Washington on April 13, 1983.*



USAF

*An artist's concept of a Space-Based Laser Satellite Defense System.*


EIRNS/Philip Ulanowsky

*The LaRouche movement rallies on the east steps of the Capitol building in Washington, in support of the SDI as a science-driver program to end the nuclear war threat and restore the economy, April 13, 1983.*


EIRNS/Stuart Lewis

*The LaRouche movement rallies 10,000 people in Washington, in campaigning for the SDI and a program to feed Africa, on January 15, 1984.*

Saxon" populations of the world. Russell was repeatedly explicit in proposing mass-murder through biological weapons, as a way of reducing the "darker-skinned" populations of the world. Given the circumstances, I have no doubt that Moscow will be tempted to deploy its massive biological warfare capability, as an alternative to other modes of warfare.

Since approximately the middle 1970s, there has been a geometrically increasing spread of the most dangerous type of viral disease known, the lentivirus usually referred to as "AIDS." Although the disease has a reputation for being spread through homosexual and serological means, the fact is, there are no limits to the means by which mutations of this rapidly mutating sort of lentivirus can spread through vectors and other means of communicability. It could destroy the entire human race.

The leading problem is that it is a lentivirus ("slow virus"), whose infection may not become symptomatic for several years, for about five years, or for about ten years. Yet, long before symptoms erupt, the infected person can communicate the virus (with 100% ultimate mortality) to others. It can erupt as an AIDS related complex, erupt later as a form of pneumonia, and erupt after about 10 years as a fatal disease of the central nervous system. Some of the latter types of symptomology are now erupting in the U.S.A., signifying that the infection occurred about ten years ago in these cases.

Putting to one side, the question presently much debated among the specialists, whether such viruses can be

White House

*President Ronald Reagan announces the Strategic Defense Initiative in a national television broadcast on March 23, 1983.*

synthesized, the fact remains that we have reached already the levels of austerity which I forecast, ten years ago, would lead to a deadly eruption of old and new varieties of pandemics during the latter half of the 1980s. We have in biophysics, a well-founded experimental hypothesis, that new viruses can be produced by sickened human tissue, some to spread as epidemics or pandemics. Certain lines of cancer research suggest this to be the case. In any case, the creation of the conditions of famine, poor sanitation, and epidemic, as a result of economic policies, is guaranteed to promote eruption of both old and new varieties of pandemics, once a sufficiently large and concentrated portion of the world's population begins to be struck by these pandemics.

This view of current trends in history, was among the governing motives in my designing the proposal I issued to a Washington seminar in February 1982, to create a layered ballistic-missile defense based upon coherent electromagnetic directed radiation and related effects. It was a matter of design, that I issued this proposal first to a seminar at which I knew a number of key Soviet as well as U.S. representatives would be present. Either both superpowers must agree to this alternative to "nuclear deterrence," or the initiative of one must force the other to enter into such agreement.

Later, during the Summer of 1982, through the intersecting influence of the group around Lowell Wood on Edward Teller, this proposal was adopted by the President as his SDI proposal of March 23, 1983. Now, despite Moscow's frantic opposition, either that proposal is implemented, or general war is almost a certainty.

In describing this proposal, at the close of 1982, I employed Schiller's term, "*punctum saliens*," to describe the implications of the proposal. Its implementation means not only the elimination of the "nuclear deterrence" and related "New Yalta" arrangements. There are two other leading implications, which flow almost automatically from the SDI's implementation. First, it requires a fundamental shift in U.S. economic policy, away from the "postindustrial drift" of the recent twenty years, to "crash program" orientations for high rates of technological progress, in a capital-intensive, energy-intensive mode. Second, the mobilization of the U.S. economy in this way, means a reversal of the past twenty years trends in economic relations with developing nations generally, toward policies of assisting those nations in achieving high rates of technological progress. Thus, because of the practical implications of implementing such an SDI policy, the result must tend to be a reversal of presently prevailing directions throughout the world at large.

It might be argued that there ought to be other ways of effecting such a change, rationally, by means other than a military program. Hypothetically, such alternatives exist; in political reality, they do not exist. In any case, the SDI is a military urgency. Unfortunately, european culture has never sustained general technological progress on a broad scale except as a correlative of economic mobilization of strength in depth for actual or possible warfare. This is not a matter of "human nature;" it reflects the fact that european culture is the intersection of two conflicting cultures, as I have emphasized in this letter. Only military decisions can change the directions of policy in european states. Hence, that particular military decision, is the "*punctum saliens*" of this period of history.

I would have emphasized the "economic spillovers" of SDI research in any case. I was obliged to stress this, because I know my governmental bureaucracy and its prevailing ideologies all too well. It is their tendency to attempt to separate fundamental research from engineering development, and to separate both of these from production for general deployment. It is their tendency to isolate "purely military research" from the economy generally. If those tendencies were permitted, the SDI would fail militarily: only "crash program" methods can succeed. So, I was obliged to

stress the "economic spill-overs" as an integral feature of the "purely military" aspect of the program, rather than simply describing them as a forecast benefit of the military program.

The same principles apply to space programs, to which the SDI is closely related in terms of technologies. For example, China could develop its SDI research quite nicely as a subsumed feature of the space program. It is the same technology for both, and progress in the one is automatically progress in the other. Optical biophysics is a related matter. The classes of experimental equipment required for a full spectrum of work in optical biophysics, overlap the types of equipment needed for SDI and space-program work. For example, large-scale spectroscopy of biological samples, which requires the type of computer assistance needed for SDI and space-program research.

I would recommend to you, your colleagues, and your government, that China consider concentrating much of its physical science under institutions integrated by a common mission-assignment respecting the colonization of the Moon and Mars. For reason of the nature of the primary and auxiliary technologies that mission-assignment implies, not only space-research and BMD, but every frontier of scientific inquiry is implicitly subsumed in the most efficient way under that mission-assignment. This would foster the highest ratio of scientific benefit in every field, per average scientist and technician employed.

The model of reference I recommend to you, is the initial four years of Monge's École Polytechnique. This is the best model of reference for studying the relative successes and failures of other "crash programs" of various nations since.

Sincerely Yours,
Lyndon H. LaRouche, Jr.

Encl:

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