V. From Lyndon LaRouche

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Economic Science as an Alternative to Liberalism:

Ibero-America's Strategy To Defeat the Coming Financial Collapse

by Lyndon H. LaRouche, Jr.

This is part 2 of the introduction by Lyndon LaRouche to the Schiller Institute's 1986 Spanish-language book, La integracíon iberoamericana: Cien millones de nuevos empleos para el año 2000! (The integration of Ibero-America: 100 million new jobs by the year 2000!). *Part 1 can be found here.*

The most direct means by which the student of economic science may understand the common outlook of Cusa, Leonardo, Kepler, Leibniz, Riemann, and my own discoveries, is to consider the central feature of the mathematical physics of Leonardo and Kepler.

Leonardo, in collaboration with Luca Pacioli, showed that all living processes are distinguished from ordinary forms of non-living processes, by the fact that living processes' morphology of growth and function is always harmonically congruent with the Golden Section. Today, we qualify that slightly, excepting the extremes of astrophysics and microphysics, any process which is harmonically congruent with the Golden Section, is either itself a living process, or is a special class of artifact of a living process.

Possible self-portrait in 1513.

Leonardo da Vinci (left) showed that the growth and function of all living processes are always harmonically congruent with the Golden Section. Since God is a living God, Johannes Kepler (right) showed that the laws of astrophysics must be derivable by nothing but constructive geometry, as an harmonic ordering coherent with the Golden Section.

Kepler explicitly based all of his contributions to physics on this discovery of Leonardo's, as Kepler understood this discovery from the standpoint of Cusa's Maximum-Minimum Principle. Kepler constructed a series of hypotheses, to prove that, since God is a living God, that the laws of astrophysics must be derivable, by means of nothing but constructive geometry, as an harmonic ordering coherent with the Golden Section. With one important, secondary qualification, Kepler's is the only accurate astrophysics, still today. Kepler's

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astrophysics works, relatively speaking, as the astrophysics based on the tradition of Galileo, Descartes, and Newton does not.

After the work of Gauss, this role of the Golden Section can not be used competently in support of any form of mysticism. The Golden Section is nothing but the characteristic projection of conic self-similar-spiral action. Wherever the Golden Section appears as the metrical characteristic of an experimental subject-matter, that is adequate proof that the process examined is dominated by multiply-connected, conic self-similar-spiral action. Such processes dominate three areas of scientific inquiry: astrophysics, fundamental features of microphysics, and the actions of living processes.

Lithograph by B.E. Ritmüller, after Jensen

After the work of Carl Friedrich Gauss, we see that whenever the Golden Section appears as the metrical characteristic, that is proof that the process is dominated by multiply-connected conic-self-similar spiral action, in astrophysics, microphysics, and life.

A healthy economy, one whose potential population-density is being increased through technological progress in an energy-intensive, capital-intensive mode, is a special sort of artifact of a living process. An economy which is not progressing in this way, is a dying economy, one doomed to extinction unless it changes its policies fundamentally.

The source of technological progress is, in the final analysis, creative discoveries produced by individual minds. In other words, through the individual human mind's divine potential for reason, the mind is able to assimilate the laws of the universe, and to create the idea of new states of matter in the same manner the universe itself creates new states of matter. The simplest example of this, is valid new fundamental discoveries in physics, or related creations of new technologies. When society uses these valid discoveries, as a guide to changing the way man produces wealth, the result is an increase in the average individual's power over nature, an increase of power which we experience as economic growth.

We should not leave this point, without remarking on some of the other ways the individual human mind produces creative changes.

The ancient Greeks already emphasized, that beauty in form is obtained by harmonic orderings congruent with the proportionings of the human form. In other words, harmonic orderings congruent with the Golden Section. The design of the Athens Acropolis was based upon this principle. Leonardo da Vinci made this conception of beauty rigorously precise. The same principle governs beauty in polyphonic musical creations. This role of the Golden Section in beauty, is plainly a reflection of the Least Action principle, the same principle governing the laws of the physical universe. Hence, scientific creativity, and beauty of creative artistic productions are equally reflections of the same universal laws, and of the same developed capacities of the individual human mind.

Hence, truth and beauty are shown to be one and the same, from this standpoint. Artistic beauty celebrates and strengthens those faculties of the mind which are otherwise the seat of creative scientific accomplishment.

The embrace of this attitude toward science and beauty in art, is an act of love toward the Creator, a love of the Creator's laws, a love of acting to mankind's benefit in the manner prescribed by those laws. Thus, truth, beauty, and love, are one and the same quality of the mind and of human practice.

A society, in which the reciprocal relationship between the individual and the society as a whole, is based on this view of the unity of truth, beauty, and love, is a form of society which has dedicated itself to be efficiently an embodiment of the principle of life in the most general way. Such a society has the characteristics of a healthy living species.

The Technology of the Next 40 Years

By close study of the internal history of scientific progress during the recent 500 years, and by correlated study of the principles governing rates of economic development, we may report with confidence, that technological progress in four areas of present-day scientific breakthrough, will be the outer limits of techno-

logical progress during the coming 40 to 50 years. On the basis of this knowledge, every government, every region of the world, and every circle of private entrepreneurs, ought to plan its investment and social policies for the decades ahead. That is, every investment decision and social policy, which contributes to advancing nations in the direction indicated by these technologies, will succeed; whereas, if investment and social policies have a different direction, the result will be painful failures.

The technologies now emerging to dominate the future are, in fact, each and all but branches of the same unified scientific conception. Yet, although more or less closely interconnected, the branches are distinguished from one another in practice by specialization. The principal branches are four in total, of which three branches are properly described as "primary," and the fourth, "auxiliary."

The three primary branches are the following:

1. Man-controlled plasmas of very high energy-density cross-section, typified by, but not limited to, controlled thermonuclear fusion as man's future primary energy-source.

2. Man-controlled forms of very-coherent electro-hydrodynamic radiation, especially applications in which the self-focusing properties of coherent beams generate very high energy-density cross-sections at the point of targeting.

3. Optical biophysics, whose experiments are sometimes listed under the title of "non-linear spectroscopy." This examines the characteristic features of living processes, in terms of electro-hydrodynamics, a far more profound and fundamental approach to principles of biology than those forms of microbiology currently associated with "bioengineering."

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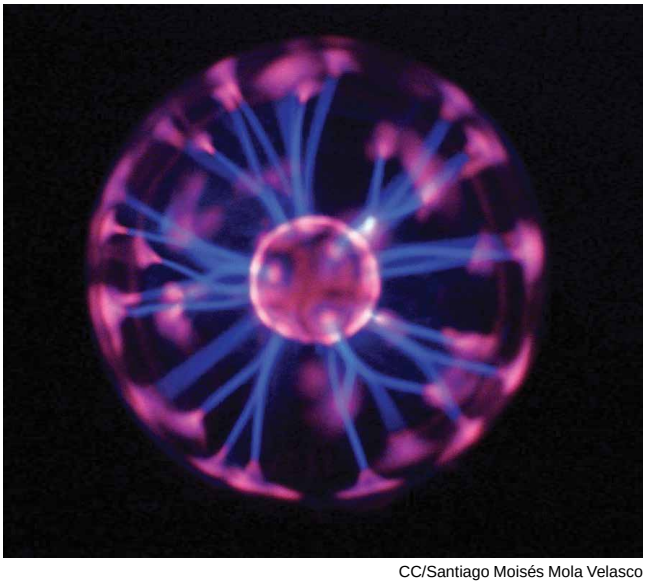
The technologies now emerging to dominate the future are branches of the same unified scientific conception. One such branch is man-controlled plasmas of very high energy-density. Shown: the HL-2M Tokamak fusion reactor in Chengdu, Sichuan Province, China.



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Man-controlled forms of very coherent electro-hydrodynamic radiation is another emerging branch. Shown: a plasma ball.

The auxiliary branch, is represented today by revolutions in computer technology. Two revolutions in the nature of characteristic computer operations are currently under way.

The lesser revolution, is the development of modes fairly described as "true parallel processing," which have the objective of producing dedicated and general-application modules in the megaflop and gigaflop range. The more profound change, is the development of a special class of analog-digital hybrid computer, whose optical-analog element is developed to perform, directly, non-linear functions in differential geometry. Accompanying these two directions of development, is a radical transformation in the principles of architecture of data-processing systems, abandoning the architecture established by Professor John von Neumann.

The computer revolutions are indispensable for pro-

viding us the automatic and manned instrumentation of very high energy-density cross-section processes, and for increasing, by an order of magnitude or more, our ability to deal with instrumentation of complex processes in optical biophysics.

All four branches' development are being accelerated now, by work toward deployment of advanced physics principles for weapons of strategic defense. The same array of new technologies is required for a now-projected colonization of Moon and Mars; an A.D.

Why Use the Term 'Ibero-America'

"The use of the term 'Ibero-America,' in place of 'Latin America,' is the only correct one," comments Lyndon H. LaRouche, Jr. "In the first place, the official languages of the region to the south of the Rio Bravo are dialects of Spanish and Portuguese. In the second place, Spanish and Portuguese derive from Italian, not from Latin. The myth that Italian, French, Spanish, and Portuguese were dialects of Latin roots, is an invention of the early nineteenth century, political propaganda against the Italian nationalist movement. The fraud that Italian derives from Latin was invented in the first decade of the 1900s, to attack the work of the philologists Wilhelm and Alexander von Humboldt and their Italian collaborators.

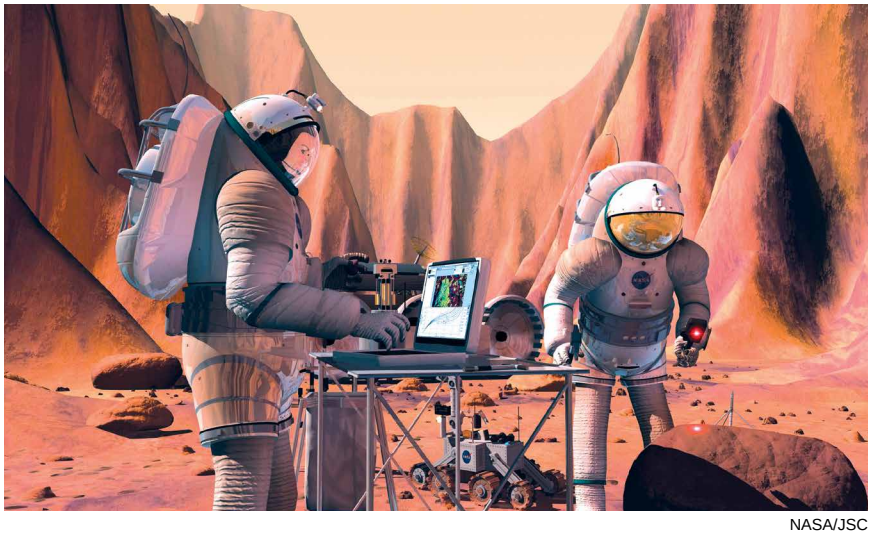
"In the third place, Italian is as ancient, at least, as Latin, and much more ancient than the Latin of ancient Latin literature. The Romans, while conquering the other peoples of Latin speech, conquered one by one the other peoples of Italy, the majority of which did not speak Latin but the Italian language, which was as perfected as the former and more broadly diffused. Moreover, the majority of the Roman soldiers, for example, spoke Italian as their native language. As a result of this, approximately 90% of the French population of the fourteenth century spoke Italian and not courtly French, which was introduced as an artificial dialect to the French royal court at the beginning of the seventeenth century.

"To use the term 'Ibero-America' is obligatory not only for reasons of philological rigor; the distinction between the terms 'Latin America' and 'Ibero-America' has a profound practical importance in politics and culture. Present-day Ibero-American culture is a product, fundamentally, of three political-cultural elements: a) the Augustinian influence in the peninsula which culminated in the period of Alfonso the Wise; b) the influence of the Italian Golden Renaissance, of the fifteenth to the seventeenth centuries; and c) the participation of outstanding forces of Spain, Portugal, and Ibero-America in the Transatlantic movement led by Benjamin Franklin between 1766 and 1789, and later by the Marquis Gilbert de Lafayette. Except for the influence of the American System of political economy and the model of the United States Constitution of 1787–89 in Ibero-American politics, the dominant cultural traits of the Spanish-speakers and Portuguese-speakers of America are Iberic, Italian, and German influences—let us say, that of Humboldt—opposed to that of the House of Austria.

"Finally, if the Augustinian Church of Western Europe did much to transform the Latin of the Roman Empire into an illustrious language, such that the medieval Latin of theology and philosophy was much more capable of expressing profound ideas than ancient Latin, the political movements to create sovereign and republican nation-states, starting from the work of Dante Alighieri (for example: *De Monarchia*; or the *Concordantia Catholica* of Cardinal Nicolaus of Cusa) were dedicated to completing the plan of Dante to elevate the quality and the political category of the national vernacular tongues, as is exemplified in the role played by the *Commedia* of Dante in the elevation of Literary Italian to the profound capacity of conception of Plato's classical Greek.

"This was the historical basis of the great movements for the founding of republics, which were unleashed in the majority of the Spanish speaking and Portuguese speaking portions of the hemisphere in the era of the Napoleonic war. It is to these historical foundations which all the great political movements of the hemisphere must today return, as well as to the notions of the American Revolution of 1776–89 and the Ibero-American revolutions, to encounter a common political-cultural basis for their mutual relations and their common actions."

2027 date for beginning the permanent colonization of Mars has been proposed by a U.S. commission. Using the results of 1960s U.S. aerospace development as a point of reference, it is easily shown that new directions in technology of production and product-design will emerge as a by-product of development of the indicated four branches of technology for purposes of strategic defense and space-colonization.



NASA/JSC

It will take about two generations of technologically advanced retooling of production on Earth to be ready to begin Mars colonization. Shown: an artist's rendering depicting NASA scientists conducting sample analysis on Mars.

For example, flight between Earth and Mars will not occur as flights of individual spacecraft. Each flight will occur as the flight of a flotilla of spacecraft, most probably about five at a time. During the flight from Earth to Mars, and back, there will be physical movements from ship to ship, through small space vehicles, analogous to the captain's launch of an ocean liner. A ballistic trajectory between the Earth and Mars is a long flight; a long period in zero-gravity is not recommended for health. Space-ships flying between the planets will be under either continuous acceleration, or continuous deceleration, each probably at a rate acting with a force of one gravity on the occupants of the craft. The source of power for such flights will be fusion power.

Fusion power (controlled thermonuclear fusion) will also be the prime source of power for the colonies on Mars. The basic tool used on Mars, will be high-powered lasers and similar instruments. The technology of optical biophysics will perform a central role in sustaining the organic environment and food-supplies during space-flights and on Mars.

About two generations of technologically advanced retooling of production on Earth, will bring Earth's economy up to the level that we will have perfected the broad spectrum of technologies needed to begin Mars-colonization. In the meantime, during the late 1990s, or shortly after that, the permanent colonization of the Moon will have begun; the industrialized Moon will produce many of the heavier components of the spacecraft used for Earth-Mars flight, as well as some key components to be shipped through space for starting the initial colonization of Mars.

It should be obvious enough, that at the point we have the technology to sustain colonization of Mars, we will be able to transform large tracts of the world's deserts into rich agro-industrial complexes. Over the coming generation, or perhaps slightly longer, the level of productivity of operatives will be about ten times the productivity of skilled operatives in Europe, Japan, and North America today. That means, that a house which is as good or better than one which costs $250,000 to build in the United States today, would cost only about a half a years' pay for a skilled worker by 2010 or 2020. This means that, by that time, we can afford to build cities whose construction-cost would be several millions of dollars per household today. The yields per hectare then, will be between five to ten times the best average yields in the northern hemisphere today. All this assumes that we direct the policies of investment and social policies, including education, along the pathways which assure effective use of the new technologies now emerging.

The technological policy of the states of Central and South America, must be, to direct investments and promotion of trade in such a way, that by 2020 (about two generations from now), the level of productivity throughout the continent will be approximately that then prevailing in the most advanced portions of the northern hemisphere. The technologies we have indicated, must be the dominant technologies of the continent by that time.

To analyze this process of technological transfor-

mation, the methods for solution of non-linear problems associated with the LaRouche-Riemann method, are indispensable.

The General Program of Development

The present levels of development vary greatly, from nation to nation, throughout Central and South America as a whole. In some nations, a greater or smaller part of the population lives and works at a level of technology and income approximately that typical of Europe. In most of these same countries, a greater or lesser portion of the rural area and urban poor, live in extremely depressed states of productivity and income. The crucial problems through the continent as a whole, are chiefly two: provide productive employment for the great mass of unemployed, and establish a rational, mutually advantageous relationship between the urban centers and rural production.

The colonial system, including the cases of semi-colonial states of nominal political independence, has two pathological characteristics: foreign looting of mining and rural production, and the development of oversized, slum-infested cities which have chiefly a parasitical relationship to the countryside. The looting of mining and of the countryside generally, means that the rural population is a very poor market for urban goods. Farmers in general, are unable to purchase technologies essential for significant improvement of the per capita and per hectare yields of agriculture. Therefore, urban centers develop very poorly as centers of industrial production for the domestic market as a whole. The cities become predominantly administrative centers, centers of tourism, and dumping places for displaced, unskilled, rural poor.

Under such or similar conditions, the basis for development of the economy is primarily massive development of basic economic infrastructure plus providing protected fair prices for agricultural products, the latter at levels at which the farmers are able to be a market for the kinds of urban-produced technologies which raise the levels of per capita and per hectare agricultural development. Within this context, the emphasis must be the fostering and protection of urban industries based on expanded markets for industrial goods consumed in infrastructure-building and development of agricultural productivity.

Within this context, each nation must develop advanced capabilities in production of capital goods. The domestic market for such capital goods, will be the industries supplying infrastructure-building and agricultural development. Through "common market" agreements, the few capital goods industries in each nation will become part of a broad spectrum of capital-goods production throughout the common market as a whole. So, each nation will export some capital goods to other nations of the common market, and use that revenue to purchase other types of capital goods from other members of the common market. The point to be stressed, is that the projected common market presently represents a population in the order of 350 millions persons, in which no nation (excepting Brazil to some limited degree) has a sufficient labor-force base to sustain a broad spectrum of capital-goods industries. Since the average income and productivity of most of the population is very low, this kind of constriction is presently an acute one. However, the market as a whole, is a rich market for capital-goods production, on condition that relatively high portions of aggregate national income are properly invested in economic development.

The major market for employment of the present masses of the unemployed, is building new basic economic infrastructure: water-management, production and distribution of energy, general transportation, communications, and such basic urban infrastructure as schools, hospitals, public sanitation, and so forth. A very large portion of the total labor-force is required for this purpose: without building infrastructure, agricultural and industrial development on an extended scale is impossible. The commodities and services which represent the wage-equivalents for employment of the unemployed, can be supplied chiefly by domestic production, without requiring foreign credit for anything except some essential capital goods. Therefore, the mode for employment of unemployed for infrastructure-building is issue of lendable currency by the national banking institutions.

This is not inflationary, since we are, essentially, converting waste, unemployed labor, into production of useful things. The wealth created, will greatly exceed the costs involved. This labor will significantly increase the domestic market for consumer goods, stimulating growth of investment and tax-revenues.

Transportation will have an immediately beneficial effect upon the productivity of agriculture. It will permit orientation toward market-production, and facilitate re-

duction of spoilage, both increasing national income. One of the greatest real costs to developing nations, is the low life-expectancies of large portions of the population. Every person who dies prematurely, is an economic loss of the investment in that person, and in the production which that person might have contributed. Better nutrition, clean water, and improved sanitation and health-care, are not only morally imperative, but are also a direct economic benefit of infrastructure-building.

Energy-production is the precondition for increasing the productivity of agriculture and mining, and for making possible investments in modern modes of urban production. The upper limit for employing improved technology, and for increases in per capita and per hectare productivities, is, in first approximation, the quantity of usable energy consumed per unit of population-density. Without adequate increases of energy-throughput, per capita and per hectare combined, there can be no appreciable improvements in productivity or output.

Schiller Institute

As a consequence of lack of infrastructure development throughout the nations generally, the urban populations of developing nations tend to be concentrated in the vicinity of the limited number of urban centers which have some basic elements of urban infrastructure. The cities tend toward becoming slum-ridden megacities, which are both inherently inefficient, and into which large sums can be sunk without perceptible improvement in the conditions of the city overall.

The remedy is to reduce the size of population of these cities, and to tear out entire sections which are beyond economical repair. This is best accomplished by founding of new urban centers at some distance from present ones, and planning and developing the new centers as "model cities," designing for efficiency, and for ease and relatively low cost of maintenance. By populating the new urban centers with households associated with new employment in those centers, the excess population of existing, burgeoning, old urban centers can be drawn down in a rational and equitable manner.

An associated feature of the problems of oversized, older urban centers, is a tendency toward excessive reliance on automobile and bus transport. Modern forms of intra-urban mass-transit are indispensable remedies. A closely related problem, is the fact that inadequate development of modern railway systems is a leading obstacle to development of new urban centers.

Paralleling the primary urgencies for agricultural and infrastructural development, is the lack of adequate development of the labor force as a whole. The principal deficiencies to be remedied include education, public culture, nutrition, sanitation, and health-care delivery.

The model policy for primary and secondary general education, is the Schiller-Humboldt program for educational reform, as just recently proposed by the relevant agency of Japan. If the next two generations are not to fail to meet the qualifications new technologies will dictate, public primary and secondary education must emphasize classical culture and pre-scientific qualifications. Obviously, a shift in emphasis within mathematical and science curricula must occur, building the pre-science programs for all pupils around the conceptions of synthetic geometry. In classical culture, the emphasis must be on principles of truth and beauty. The influence of positivism and pragmatism must be removed from educational policies.

In higher education, the emphasis must be on increasing the ratio of matriculants in science and related specialties, deemphasizing the positivistic "new sciences" which have emerged since the middle of the nineteenth century: ethnology, sociology, behavioral psychology, and so forth. In a well-ordered society, most of the present ratios of graduates in the "new sci-

ences" specialties would be unemployable in such professions, and ill-equipped to make a useful contribution to the advancement of society's goals.

In the advanced economies, the tendency has been toward employing about 5% of the labor force in science. The trend must be increased toward the vicinity of 10% or higher. Apart from functions of education, research, and engineering, the modern work-place will become increasingly "scientific-knowledge-intensive," requiring the skilled operator to employ some significant grounding in the rudiments of the new physics. In agriculture, a similar trend will appear. In general, the ability of the citizen to adapt to the practical experience of everyday life, will require increasing familiarity with the qualities of new technologies being generated.

Over recent decades, especially, there has been a growing tendency to equate "culture" with hedonistic forms of recreation, and to deemphasize that joy of experiencing beauty, which latter is the characteristic feature of classical culture. The emphasis on hedonism, an endemic tendency among sex-sensitive adolescents, tends to lower the level of moral intelligence of the population; hedonism bestializes, draws the individual away from the pleasure of creative mental life, and thus produces a less moral, less patriotic quality of citizenry.

This issue intrudes into economic policy directly, in architectural policies, and in the issue of allotting scarce resources either to classical cultural facilities and programs, or to facilities and subsidies for so-called "popular," hedonistic entertainments. In the course of history, nations and cultures which have, like ancient Rome, preferred hedonistic entertainments, have facilitated their own destruction, by fostering a lowering of the moral sensibilities of their own populations. The Colosseum of Rome is an example of how public expenditure may be misdirected to foster the self-destruction of a nation and its people.

True beauty and love, set in a context of the fostering of technological progress, is the distinction of a good and durable form of society.

As to the monetary measures of reorganization needed, to facilitate the implementation of such economic programs, I have outlined these adequately in my 1982 *Operation Juárez*.

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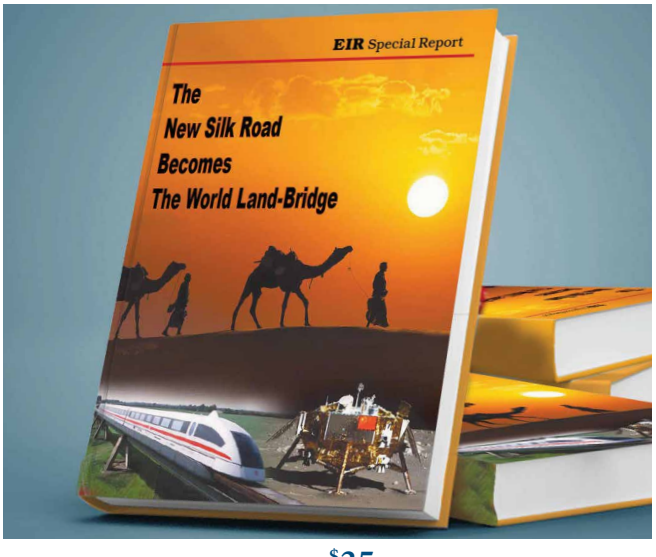

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