EIRSpecialReport

Part Three

Systems analysis is white-collar genocide

by Lyndon H. LaRouche, Jr.

We have reserved the most challenging conception for this concluding portion of our report. Although what we report now does not violate our policy of limiting this report's contents to the intellectual capacities of intelligent graduates of proper secondary-school education, what we must report now is admittedly more difficult for many among those readers than what we have outlined so far. It is by no means beyond the comprehension of such a reader, and much of what we report now will appear quite elementary to that reader, at least in afterthought. Yet, the crucial points included here do, we admit, represent some cause for culture-shock.

Therefore, as we have just noted, we have scheduled the culture-shock for the concluding portion of this report, after the general principles of our argument have been made clear.

The core of what we must outline here is elaborated more fully in a recent report outlining a policy for teaching of geometry in public schools.[1] The reader who desires to explore these matters more deeply will find that publication useful.

Negatively, our argument so far is elementary, rigorous and conclusive. The argument setting forth the application of potential relative population-density is also elementary and conclusive, at least as far as we have taken that so far in this report. Yet, if the average reader were to attempt to elaborate this proven approach to develop an actual economic analysis, the reader would soon find, in most cases, that the attempted application guides one to further conceptions whose initial impact is perhaps best described as "dizzying"—like the first time the reader, as a youth, jumped from the high diving-board into a swimming-pool. (It is delightful, once one has done it a few times.)

The analogy is appropriate. Most people, including some presumably well-educated professionals, who have confronted these conceptions retreat from them in the manner like the anguished youth who walks to the edge of the high diving-board, hesitates for a while, and then retreats, blushing with shame, and perhaps shaking slightly: "I can't do it." In confrontation with
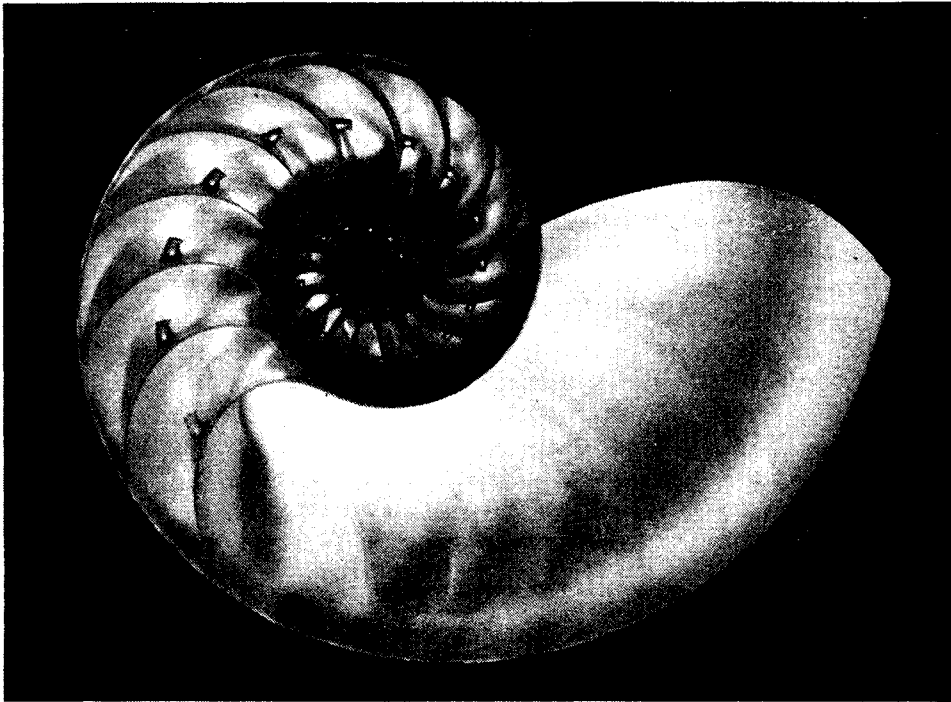
The Golden Mean relationship exhibited in living processes: every seashell's logarithmic spiral is determined by the Golden Mean ratio.

such conceptions, many have said: "I just can't accept that. I would have to give up most of what I have been trained to believe, if I were to accept the implications of that proof." Yet, despite what most were once "trained to believe," the earth is not flat, and the planets orbit around the sun in visual space. (Often, psychological cowardice is a more powerful force than physical cowardice. So, by means of playing upon a recruit's psychological cowardice, military commands force soldiers to charge against rifle and artillery-fire.)

The mental cowardice which prevents students and professionals from beginning to master a competent variety of mathematical economics is best identified as the fraudulent representation of the universe by René Descartes's and Isaac Newton's parodies of Descartes's error. Once the reader recognizes that these views are not only erroneous but pathologically fallacious, mastery of mathematical economics becomes feasible.

All modern mathematical physics, and the mathematical methods applicable to economic science, originates with the three principal published writings of Johannes Kepler at the beginning of the 17th century. Unfortunately, the interpretation of Kepler's work found in most undergraduate textbooks, classrooms, and related sources today is incompetent. It is either intentionally fraudulent, or merely a credulous regurgitation of what the dupe has been taught to recite on this topic. Kepler's accomplishment, especially when employed to expose the sheer fraud of Descartes's and Newton's physics, is the most efficient reference-point for introducing competent mathematical economics to graduates of

In Parts One and Two

The first two installments of this series, published in the Dec. 22 and Dec. 29, 1981 issues of *EIR*, identified systems analysis as an economic methodology that is viciously inapplicable to macroeconomics over periods longer than a few years, because it axiomatically denies the primacy of technological innovation in determining the course of those economies.

The author identified potential relative population density (i.e., the number of persons who can be sustained on an average square-mile of habitable territory by means solely of that population's productive efforts) as the key metric in that respect. The ratio of **net work to virtual work**, expressed as a series, determines the increase in that potential relative population density. Linear models, by contrast, rationalize a political policy of rentier economics, industrial contraction, and extermination.

This installment is the final portion of this article.

secondary schools (or higher institutions).

What Kepler proved was not merely that the solar orbits are defined as a harmonic series of possible orbits—independent of the masses of the bodies. What Kepler proved empirically, and conclusively, was that Euclidean space is not physical space. Euclidean space—the space of the geometry of vision—exists in reality, but it does not contain within it the larger reality of which it is only a part. Kepler proved this, by proving that the ordering of physical events in solar space is wholly governed by principles of a nature which can not be contained within the geometry of visual space (Euclidean space): the principle of the Golden Mean ($x^2 - x - 1 = 0$, in algebraic terms).

It was earlier established, by the work of Nicholas of Cusa, of the circle of Leonardo da Vinci and Luca Pacioli, and others, including Albrecht Dürer, that all living processes tended to exhibit principles of geometric ordering consistent with the principle of the Golden Mean. Kepler applied this to the most-conclusive body of empirical evidence available for a decisive *(crucial, unique)* experimental test of the principle at that time: the solar orbits. He proved that the entire solar system was ordered according to principles of proportioning for which the Golden Mean is paradigmatic.

Later, Isaac Newton and Newton's admirers have lied outright, attempting to deny, for example, that Kepler actually succeeded in discovering elliptical orbits, and that Kepler had not seen a connection between his laws and earthly gravitation. Both statements were outright lies, which could not have been kept in circulation in English-speaking countries if publication of English translations of Kepler's principal writings had not been suppressed up to the present time.

The truth of the matter is simply this. Kepler proved a number of fundamentals, sufficient to establish all modern mathematical physics as a coherent discipline. There were some things he did not complete, but it was his genius to define the need for discovery of such things as the calculus, establishing the guide-lines Leibniz employed to effect the development of the calculus before 1676. From the successive work of Kepler and Leibniz, most emphatically, all competent strains of modern mathematical physics flow. True, Kepler did not perfect the theory of eliptical functions; it was the enemies of Newton and Cauchy who did develop the theory of elliptical functions, up through the essential completion of that work by Bernhard Riemann in the late 1850s and early 1860s. However, Kepler defined the importance of developing a theory of elliptical functions, and set science along the pathway of successive developments which led to its fruitful realization in later times.

Enough of that aspect of the matter. We turn directly, that background identified, to the problem of defining a physical space and the indispensable contribution of such a definition for mathematical economics.

The starting-point of the work leading into Kepler's discoveries, as Kepler himself details rigorously in step-by-step fashion, is the great problem of geometry posed beginning the Tenth Book of Euclid. It was proven, at the Cyrenaic temple of Amon, during the fourth century B.C., that only five regular polyhedra can be constructed in Euclidean space. In other words, all of the postulates of proof by construction which lead into the topics of the Tenth through Thirteenth Books of Euclid lead mankind rigorously to the result that the internal ordering of all such geometry—the geometry of visual space—is governed by some principle which does not lie contained within the geometry of visual space. The characteristic quantifiable (determinate) *expression of* this "external principle" for visual (Euclidian) space is the Golden-Mean proportion.

This principle, that visual space is merely a subspace of physical space, but in projective congruence with the whole of physical space, was elaborated mathematically for geometric physics generally by the work of Riemann, leading, chiefly by way of Riemann's influence among Italy's scientists, to A. Einstein's flawed but useful discoveries concerning a Riemannian universe.

Elementary particles do not exist as ontologically self-subsisting substances, and physical processes are absolutely not governed by action-at-a-distance among particles in aprioristic empty space. Nor, as has been repeatedly demonstrated empirically, is empty space conveniently filled with an ether of the sort which James C. Maxwell contemplated as the key to making Newton's incompetent mechanical scheme credible to the 19th century.

What we see in visual space is the reality of a larger, physical space, projected as images into visual space. The principle governing such projective relationships must be, as Kepler proved conclusively, and as spiral nebulae affirm Kepler's proof today, based on harmonic proportionings *of a sort which subsume* the Golden-Mean proportioning.

What we must observe and measure in visual space, if we are to infer rigorously processes in physical space, is not things, but the ordering of transformations.

We are greatly aided in beginning to understand this point by adopting the viewpoint of elementary (Euler, et al.) topology. In elementary topology, as in physical reality, two points do not determine a line; rather, the intersection of two lines determines a point; the intersection of surfaces determines lines; the intersection of solids determines surfaces; the intersection of higher-order processes determines solids. A point, a line, a surface, a solid, is a zone of ambiguity, of overlap of the intersecting, geometrically high-order forms which define that point, line, surface, solid. These ambiguities, or boundaries of overlap, are termed *singularities*.
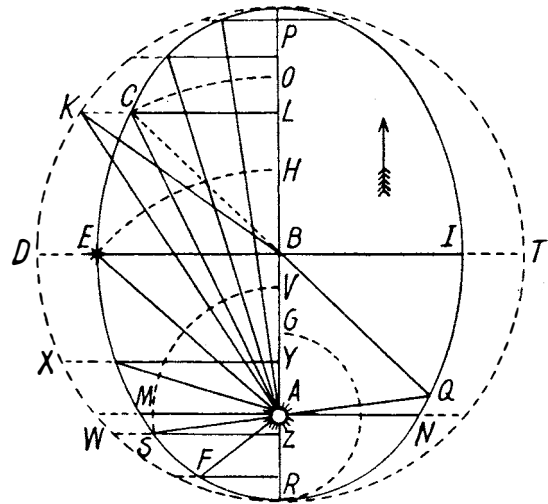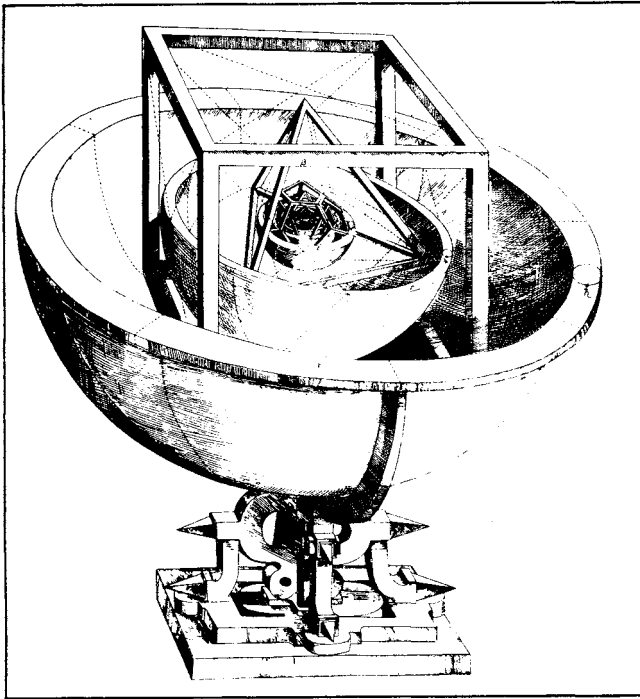
At left is Kepler's 1596 demonstration of the harmonious relations among the five Platonic solids. Above is a diagram demonstrating his 1609 Second Law, which paved the way for elliptical functions. It states that the radius vector of an elliptical planetary orbit covers equal areas of the orbital plane in equal time periods, explaining why the planets move fastest when they are closest to the sun.

By definition, a singularity has no *ontologically independent* existence in visual space, and does not correspond to any elementary existence in physical space. Thus, if it is sometimes convenient for calculations, to suppose that a "point-mass" exists, it is ignorant superstition to presume because of the usefulness of such crude calculations that such a mythological being as a point-mass actually exists in the universe apart from fictions of intellectually lazy mathematicians.

As for numbers, the integers arise in geometry and physics as an associated feature of the counting of singularities, which demonstrates the geometric origin of the integers as well as all other numbers. Similarly, the idea of a "straight line" as a self-evidence, or necessarily self-evident asssumption, is another superstitious absurdity. In topology, a straight line is defined by folding a circle against itself, just as a circle is defined topologically by folding closed areas against themselves.

As we generalize from Euler's founding theorems in topology to higher-order physical geometries, we are shown that the formulas governing coefficients of topological formulas respecting singularities work to aid us in discovering what order of physical space is required to yield a combination of singularities corresponding to a formula.

At that point, we are obliged to reject as numerological superstition all attempts to construct algebra on any basis but the geometric basis for elaboration of physical topology (e.g., Riemann's topology) from the reference-point of Kepler's work.

We must interpret processes seen in terms of visual space solely in terms of adducible characteristic features of transformations—geometrical transformations—respecting whole, coherent assemblies constituting such processes. It is only when events defined in terms of the "language of visual space" (geometry) are treated as processes in this fashion, that our interpretation of phenomena of processes in visual space is in projective congruence with the ordering of processes in physical space.

Economics and physics

This is key to what we outlined in defining work in "economic space." We generalize the notion of alternative transformation-functions, by the yardstick of increases in the potential relative population-density of society. It is in this transformation of entire societies as self-subsisting processes, which defines the efficient reality of all activities occurring within an economy.

In science, this writer is responsible for discovery of two important conceptions. First, this writer, beginning with a 1952 discovery, discovered that the characteristic function required to define a competent mathematical economics is a *negentropic function,* alternately to be defined most appropriately as a *Riemann function.* Second, this writer developed, as a by-product of the elaboration of that first discovery, an important, improved proof of the validity of scientific knowledge, by locating the basis on which that proof is properly premised. The latter is now summarized here, so that we may appreciate the conclusions to which the foregoing references to Kepler and topology lead us in eco-

nomic science.

The ordering of societies in such a way as to represent societies of higher potential relative population-density emerging from the development of societies of relatively lower such potential, provides us a series of a form outlined earlier:

$$a_1, a_2, a_3, \ldots a_n$$

The developments in technology which are responsible for this progress correlate with an actual or at least implicit body of scientific knowledge. Therefore, we may treat the indicated series as defining an ordered series of phase-changes in progress of scientific knowledge. The same tactic, of adducing the transformation-functions ordering successive members of such a series, applies.

It is the ambiguity of any particular body of currently established scientific opinions in particular that the prevailing scientific knowledge today is superior to the knowledge of the previous epoch, and yet the best formulations of today may become the favorite professor's classroom jokes of the future. For reason of this ambiguity, we can not premise any absolute authority for scientific opinion, such as that prevailing in universities today, on the putative experimental proofs cited in support of such opinions. An isolated experiment proves nothing fundamental; no mere accumulation of inductive judgments from a mass of such isolated experiments proves anything fundamental respecting the lawful ordering of the universe.

Wherein, then, does the possible authority of science lie? Look again at our approach to this series we have outlined. In the first approximation, the transformation-function which is shown to define an ordered series of successive scientific revolutions is of a higher order of knowledge than any of the particular bodies of scientific opinions it subsumes as a generator. Yet, as for the general function of economic science, we require a yet-higher notion of transformation, which subsumes all first-order transformations. This latter, higher notion, we can rightly term the principle of "scientific progress."

It is the principle of discovery underlying all successful scientific revolutions which is the sole absolute authority for scientific knowledge.

How do we measure scientific revolutions, so that we may determine which are actually advances, which are retrogressions, nonproductive detours, and to compare the implied degree of power of progress and retrogression relative to other cases? The *implicit* potential relative population-density, as variously expressed by application of the technological benefits of such a revolution, or, if realization of scientific progress is constrained by social policy, what the contribution would be if the benefits of science were promoted adequately: there is the only basis for measuring scientific revolutions.

From this method of inquiry we adduce principles (policies) of scientific discovery, of scientific progress which correlate directly with increasing the average per-capita power of mankind over the universe. It is only through means of the metric of potential relative population-density that this could be determined empirically.

What, then, does it mean to generate a series of technological developments, such that the power of the average person over the universe is successively increased?

Negentropy

To increase man's average power over the universe means to increase man's command of the lawful composition of the universe. This means that the generator which orders such a succession of phase-changes in technology is in implicit congruence with the lawful composition of the universe as a whole. It means that that generator is implicitly a statement of principles congruent with the underlying, lawful ordering of the universe.

This conception is not fundamentally new to this writer. It is Plato's notion of the hypothesis of the higher hypothesis. It is the *Logos* conception in the Nicene-Filioque doctrine of Apostolic Christianity. It is the approach of St. Augustine and his followers to the ordering of secular society. What is new to this writer's conception is to situate that Logos-conception with respect to the implications of a Riemannian approach to the fundamental function of economic science.

Yet, this very notion defines the ordering-principle of scientific (technological) progress as *negentropy*; we shall clarify this in a moment. Therefore, *the lawful composition of the universe as a whole is negentropic.*

By negentropic, we mean, in terms of physical topology, that the principle $(n+m)/n$ defines a generative principle, as this notion is reflected in Bernhard Riemann's 1854 *On The Hypotheses Which Underlie Geometry*. It means that the economy defines a series, of the form:

$$(n+a)/n; \ (n+a+b)/(n+a);$$
$$(n+a+b+c)/(n+a+b); \ldots$$

It also has a simple economic interpretation:

If the total output of a society is W, and if the following subdivisions, as distribution, of W, prevail,

C = Cost of maintaining goods-producing and physical-distribution capacity status quo ante;

V = Cost of maintaining at a current level of culture, etc., all of the households from which the goods-producing sector of the labor-force is recruited;

d = The cost of all household and other costs for non-goods-producing labor-force activities;

and if

$$S = W - (C+V);$$

$$S' = (S - d) = \text{Net Operating Profit of the society as a whole;}$$

then the ratio $S'/(C+V)$ correlates with $(n+m)/n$, on condition that S' is chiefly converted into "reinvestment" in technological-progress-oriented expansion of the economy in scale and productivity.

In this case, the ratio of $S/(C+V)$ increases. Unless the policies of practice of the society are mismanagement of the society, the increase of $S/(C+V)$ correlates with increases in $S'/(C+V)$.

However, the "objective content" of average real wages and per-capita goods-próducing investment increases, at the same time that the social cost (per average total of members of the labor-force) decreases. In other words, both C and V increase in objective content, relative to preceding epochs of the production-distribution cycle, but the average cost of C and V combined decreases as a percentile of total activity of the labor-force.

This growth of the function, $P = F[S'/(C+V)]$, is negentropic. The source of the negentropy is the principle of scientific progress, mediated through actual scientific progress, and that latter mediated through technological progress. Thus, the ordering principle which causes a successful economic process to be negentropic is scientific progress, which scientific progress is nothing but those principles of discovery which, as a generative principle, is congruent with the underlying lawful ordering of the principle as a whole.

Imago viva Dei? Is it man's power to reach atonement with the Logos, which, as an activity, is the self-mediated activity, through work, which defines man as in the image of God, above the beasts? Is it, then, through exerting increasing dominion over the universe in ways expressed by increase of the potential relative population-density of society, that mankind expresses through technological progress in work, the activity of atonement with the Logos? Is it, then, therefore the case, that the function of material progress, mediated through technological progress in work, is not material progress in itself, but that material progress is indispensable to perfect the development of man's potential, individual man's potential, as *imago viva Dei?*

All human history, all evidence adducible from science, informs us that the answer to each and all of these questions is "Yes, it is so."

Whether or not the reader prefers to embrace, ecumenically or otherwise, the Judaism of Philo of Alexandria, the Apostolic Christianity of St. Augustine, or not, there is no competent dispute against the scientific authority of the *Filioque* principle as reflected

in the principle of *imago viva Dei*.

The enemies of science

Equally to the point, all forces which have rejected those principles—whether the Delphi cult of Apollo, the Mesopotamian Mobads (Magi), the cult of Isis, the ·gnostic pseudo-Christians of Justinian Eastern Orthodoxy, Jesuitry, and Anglicanism, or simply atheistic Malthusians—have proven themselves to be evil in social practice. Central to the difference between the evil Justinian gnostics of the Eastern Church and Apostolic Christianity, as between the Sadducees and Philo of Alexandria, is the issue whether the universe is linear and entropic, or a continuing creation which is negentropic. The evil agent of the Delphi cult of Apollo is exemplary of the arguments for linearity and entropy.

The universe is not composed of aggregates of very small, ontologically self-evident particles, each variously combining with other particles, and generally otherwise acting upon one another, "at a distance," across empty, aprioristic space. What ignorant opinion sees as "concrete existence" in empty space—points, lines, surfaces, solids, and so forth—are in fact merely singularities, eminently countable singularities, of a current epoch of a process of transformations. Contrary to Descartes and Spinoza, as also Schelling, the discrete existences are real, if nonetheless, like mere mortal human persons, only ephemerals in the course of the unfolding of the determining process of successive transformations.

The discrete existences are real. The discrete existences called human beings are real, above all others. Only human beings possess the divine potential expressed as the activity of scientific progress, the power to master those laws of the universe with which men and women, among all other existences, are brought into existence and pass away. Only man, among all existences of that sort, can supersede his thing-like ephemerality, to become a real, active part of the process of continuing creation.

The notion of linearity, of entropy, is introduced to credulous folk by such wretches as the sophist Aristotle through the sophist huckster's pointing to things: "See, this thing is tangible. Only it is real." So, a kind of analogy for an optical illusion occurs, in which a sophist's hypnotism so intently focuses the credulous, deluded individual upon the abstract existence of the ephemeral thing (the mere singularity of the process), that the victim's mental power to wrap his mind around the quite observable and efficient process of transformation is destroyed. From that sort of sophist's brainwashing of the credulous arises the dogma of "reductionism," the delusion that the universe is entropic.

From a higher standpoint than we propose to introduce to the readers selected for this report, we could show that God is not the chief accountant of the universe's largest public utility. The activity of the universe cannot be measured competently in units analogous to calories or watts—a procedure admittedly to be recommended to actual public utilities' billing departments. What we call "energy" is not an independent existence, but a reflection of negentropy, the work reflected in raising processes from lower to higher degrees of organization, in the sense of organization implicit in the notions of physical topology.

General conclusion

We have shown why any superimposition of linear, entropic "economic models" upon policy-making must necessarily lower the potential relative population-density of societies. If this sort of policy is continued, the potential relative population-density must fall below the existing level of population—as is occurring today in that most evil of all relics of ancient cults, the Peking regime of China, whose nation is now undergoing one of those classical yin-yang, genocidal collapse-phases intrinsic to the Taoist-mandarin heritage of the ancient Han dynasty.

Thus, all application of linear, entropic modelling to economies is intrinsically genocidal.

Worse, we have emphasized, today's Malthusians are fully conscious of the genocidal implications of their adopted economic policies ("systems analysis"), so that their capital offenses against the Nuremberg Code are not unwitting, but fully-conscious—on both the Western and Soviet side among Malthusians today.

We have situated that proof within the context of introducing the rudiments of a competent mathematical economics, exposing, for those who may require this to be stated here, the implications to which our mathematical economics leads in practice.

The simple fact which is outstanding is that any elected or appointed official of any government, or of any supranational institution, such as the International Monetary Fund, World Bank, or International Institute for Applied Systems Analysis (IIASA), who supports the policies of the Club of Rome, of IIASA, of the Draper Fund, the Aspen Institute, or President Carter's genocidal *Global 2000* and *Global Futures* proposals deserves to be indicted and removed from office into public outlawry on grounds of complicity in capital offenses, "crimes against humanity" (genocide) of the Nuremberg Code.

That fact is conclusively established without what we have written here. What we have done in this report is to strip away the apology offered by mass-murderers such as Aurelio Peccei, Robert S. McNamara, et al., that it is economics, not malice, which makes them instruments of a greater mass-murder than Adolf Hitler perpetrated.

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1. See "How the United States Could Still Surpass the Soviets in Science," by Lyndon H. LaRouche, Jr., scheduled for publication in the *Campaigner* magazine, volume 14, number 8.

EIR presents

A National Conference on Water From Alaska

Saturday, February 27, 1982
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For the first time since the mid-1960s, a serious revival of interest in tapping the enormous water and hydroelectric potential of Alaska and Canada is occurring. The dramatic threat of shortages facing major agricultural and growth areas of the nation are well known. Overcoming the fiscal and ideological constraints that have doomed regional water development plans in recent years will be the subject of this conference. It will demonstrate both the economic necessity and engineering feasibility of water from Alaska, which would cost less to the national economy than the effects of scarcity and shortages will.

9:00-10:00 a.m.   **Welcome and opening statements**

10:00-12:00 noon   **Panel: "The Engineering Feasibility of Delivering Water From Alaska."** Experts on plans developed in the 1960s and before, including the Ralph M. Parsons Company's "North American Water and Power Alliance," will detail the feasibility and enormous water and hydroelectric yield potential of water from Alaska to Canada, Mexico and the United States.

12:00-2:30 p.m.   **Luncheon and address: "The Moral and Economic Necessity of Developing Population Growth Potential"** by *EIR* founder Lyndon H. LaRouche Jr.

2:30-4:30 p.m.   **Panel: "The Economic Feasibility of Water From Alaska."** Proofs will be presented that the nation will spend more in increased costs due to scarcity if it doesn't transfer water from Alaska than if it does. Panelists: *EIR* Economics Editor David Goldman; California Democrat Will Wertz, challenging Jerry Brown for the U.S. Senate; and Kansas State Rep. Keith Farrar (R-Hugoton), a member of the High Plains Study Council.

4:30-6:00 p.m.   Closing remarks and reception.

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