NDPC POLICY DISCUSSION MEMORANDUM

Only Beam-Weapons Could Bring to an End The Kissingerian Age of Mutual Thermonuclear Terror:

A Proposed Modern Military Policy of the United States

By Lyndon Hermyle LaRouche, Jr.

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bly of its own weight of corruption not long after our retreat; with that development, the last shred of pretext substituted for purpose evaporated even from illusory perceptions.

Although the U.S. military was given no conspicuous part in the Carter administration's support for the Khomeini insurrection, the case reflects the same variety of utopian policy of practice, and in a more degenerated form than characterized the last years of the war in Vietnam. Acting on the Aspen Institute-concocted "Bernard Lewis Plan," a Kissinger-sponsored atrocity, the Carter administration connived to bring Khomeini to power, set up the conditions for Khomeini's taking of U.S. hostages, and so destroyed a long-standing U.S. ally. The whispered pretext for that particular abomination was an assault against the southern flank of the Soviet Union, intending "Islamic fundamentalism" to spill over as an insurrectionary influence into those Asian regions of the Soviet Union. Now, the Soviet Union has hegemony over the continuing process of internal unravelling of Iran, and the U.S. military is threatened with being given the task of shooting its way into the Arabistan region of an Iran which was formerly a solid ally of the United States.

Such are the kinds of consequences which follow as military and related functions of our statecraft are given the substitute of a hand-to-mouth assignment of distinct missions in place of operations conducted in necessary action to advance an unchanging direction of national purpose.

1966-1967: The Turning Point, Sharply Downward

The virtual end of a traditionalist republican policy occurred during 1966-1967. The key development was the submission of a report on NASA prepared by the psychological-warfare arm of the British Secret Intelligence Service, the London Tavistock Institute, the *Rapaport Report*.

This Tavistock proposal lamented the discerned fact that the achievements of such post-Sputnik programs as NASA were cultivating in the general population a deplorable admiration for scientific achievements, thus threatening to increase significantly the influence of rationality over the behavior of the electorate. Therefore, it was urged that NASA begin to be taken down, dropping those elements of aerospace and related research and development not indispensable to fulfill the objective of a manned landing on the surface of the Moon.

That proposal was accepted in practice by the Johnson administration. A shock of unemployment, like that of an economic depression, struck the research and development sector of aerospace and related research. Since then, the United States has made little progress in basic technology, and our industrial and human scientific and related high-technology capabilities have collapsed at an accelerating rate. Where today are many of those specific industrial capabilities which were indispensable to the successful Moon landing?

The purpose behind British intelligence's successful proposal to begin destroying the United States' technology from the inside were, as early registered, the promotion of the destruction of the U.S. industrial economy, a policy for transforming the United States into a "Clockwork Orange" nightmare, called by many the new "technetronic post-industrial age."

Beginning Autumn 1969, a network of supranational financier interests, including the Aspen Institute of British Petroleum's Robert O. Anderson, created as if out of nothing a mass-based, international rabble of "environmentalists." With aid of "positive law"-corrupted Federal judges and the sly provisions of the Environmental Protection Act, the first major target of the marijuana-reeking environmentalist pack-mobilizations was the nuclear-energy industry.

Today, 15 years after the Tavistock report, leading political and news media institutions of the United States shamelessly promote policies public opinion would have rightly abhorred as abominations through the middle of the 1960s.

The most shameful example of the impact of this corruption upon our military ranks is the case of Gen. Maxwell Taylor's actions on behalf of the Draper Fund/Population Crisis Committee, from which vantage-point Taylor promotes as state and military policies of the United States precisely those same policies for which the United States hung Nazis as criminals at Nuremberg. For the Malthusians of the Draper Fund orbit and hard-core *Global 2000* circles, the function of U.S. military deployment is largely to promote regional wars, wars whose purpose is chiefly to promote large-scale reduction of the populations of Latin America, Africa, and Asia. As Gen. William Draper proposed throughout most of his public life, and as Britain's Dr. Alexander King, the patron of the Club of Rome, proposes today, the general purpose of such Malthusian missions is the hideous Cecil Rhodes policy, to wipe out great portions of the non-white populations of the world, to create future "living room" for colonizations by the Anglo-Saxon racial stock.

"Britain is our closest ally," one line of argument goes. Has Britain abandoned those policies which rightly prompted our forefathers to fight war against Britain? Are the inevitable consequences of present British policy consequences morally acceptable to bearers of the Judeo-Christian tradition? Such obvious issues of morality and interest are suppressed in favor of the mere posture: "Britain is our closest ally."

The form of assignment then assumes such directives as a mission "to cooperate with our closest ally Britain in destroying a force which is displeasing to that ally." We so degrade our military to the status of mercenary professional assassins, who kill a person or nation merely because that is the mission they have been assigned to perform. What of the vital interests of our nation as a republic, which must be defended against precisely that oligarchism the Judeo-Christian republican tradition has been combatting for two thousand years?

Before Kissinger permitted the U.S. forces to be withdrawn from Southeast Asia, he started a war in Cambodia, and brought to power in that nation the Lon Nol government, as a trusting political asset of U.S. policy. Yet, under Kissinger's direction, Gen. Alexander Haig and Thomas Enders connived with Peking China to permit the Lon Nol government to be toppled and its supporters butchered by Peking's asset, the Khmer Rouge led by Pol Pot. Under immediate direction of Peking advisers, Pol Pot butchered approximately three million of the seven million Kampucheans, emphasizing elimination of those portions of the population deemed particularly offensive because of their literacy. Today, the U.S. State Department and U.N. Ambassador Jeane Kirkpatrick support the return of the Pol Pot party to power in Kampuchea. That degraded policy is the endemic mission-orientation of U.S. policy in the Asian region.

Currently, it is argued that the U.S. defense budget must be increased to compensate for growth of military capabilities of the Soviet Union. Indeed, an annual budget-level of between $400 and $500 billion would be required to accomplish that purpose—which we could comfortably afford if we expanded the tax-base adequately by promoting increased employment through high rates of technological advancement in increased agricultural and industrial investment. However, the present budget prepares not to match Soviet capabilities, but chiefly to create capabilities for fighting regional wars in the Third World.

Would you wish to fly in a military aircraft serviced by drug-using semi-literates, so illiterate that their training manuals were composed in the form of comic-books?

Would you wish to fight a war which had been planned by flag-officers who made vital policy-decisions through a computerized poll-taking procedure?

The gradual weaning of our national military policy away from a republican definition of purpose and mission, toward a narrowly defined mission-performance responsibility, was the undermining of the quality of the traditionalist officer-corps which paved the way for the insidious process of displacement of the traditionalists by the sort of utopian associated with the variety of horror-stories illustrated, *the Kissingerians*.

The change in moral and philosophical outlook which absolutely separates the post-traditionalism from the emergent utopianism is a transition from the republican to the oligarchical world-outlook. Put more simply, as a matter of illustration, the key to this change is a shift away from the traditional republican values, in which technological progress in economy and warfare are the paradigms of task-oriented problem-solving. As the military mind rejects the values of a technologically progressing agriculture and industry, and re-situates the military task within a "technetronic post-industrial society" scheme of values, everything else to be abhorred as military utopianism follows.

What follows, in a more fundamental sense, is a disassociation of the military mind from *rationality*.

Rationality is inaccurately defined as "formal logic." Rationality is the certainty, first of all, that the ordering of chains of cause and effect in the universe is determined by a coherent body of higher principles, universal laws. Rationality takes the form in practice of a commitment to discovering those universal laws with increasing perfection. This practice is conducted by study of the general principles linking policies to their consequences. This study is founded upon study of the comparative relationships which variously do and do not lead to an increase in the potential relative population-density of society, through determination of what does constitute efficiently technological progress in those human terms of empirical reference.

When the mind rejects that definition of rationality, what results? The general name for irrationality is *nominalism,* in which the mere names for objects are substituted for the objects themselves. Instead of experimental inquiry into consequences of policies, formal-logical deductions in terms of the mere names for objects become the first step toward insanity. In the next step down the ladder of culture, even formal logic is discarded in favor of belief in "magic"; the mere opinion of persons toward the names of objects, the appeal of mere rhetoric to ignorant prejudice dominates. In the final step of descent, short of mental death, the only opinion of importance to the irrationalists is a fantasy-life centered around the fascist's governing-principle of a kaleidoscopic succession of perceived, momentary "inner psychological needs."

As the statesman or solider descends that ladder of irrationality, his commitments and actions appear increasingly evil or simply absurd to the rational onlooker. The Nazi slogan, "All is permitted," is one form of expression of the disassociation of decision-making from reason and morality which ensues. To such degenerated minds, only one objective criterion of policy-making survives: power, and some perceived increase in personal advantage, by whatever means achieved. Such are the utopians, the Kissingerians.

Thus, the general staff form of military organization, as developed successively by Carnot and Scharnhorst, is to be seen not merely as the most effective form of military organization yet devised. Examining more closely the philosophical world-outlook embedded within that design, it is also to be seen as the form of military organization *most susceptible to* the moral outlook for practice of the republican. A general staff will not necessarily be moral merely because of that form of organization, but if such a general staff is given a mandate embodying a proper republican definition of long-range purpose, it is the most moral as well as the most effective form of military organization.

6. A U.S. Long-Range Military Policy

According to the eyewitness accounts of his son Elliot, President Franklin D. Roosevelt came close to asserting a proper U.S. policy in the post-war world at several points, at least, during the 1940-43 period. Roosevelt threatened to deploy post-war U.S. power to do away with "British 18th-century methods," and to employ "American methods" to replace the British

Empire by means of such projects as transformation of Africa's Sahel into the breadbasket of that continent. Somewhere between the onset of the 1944 election-campaign and the Bretton Woods monetary conference, the British contrived to get Roosevelt and the United States back under the British thumb. From the accounts of Elliot Roosevelt, Roosevelt's threat was sufficiently direct and sufficiently credible nearly to deliver Prime Minister Winston Churchill a fit of apoplexy on the spot.

It is past time to set into motion what President Franklin Roosevelt threatened to undertake.

The proposed fundamental long-range policy now proposed is, in summary, as immediately follows.

The only strategic objectives consistent with the most vital interests of the United States as a constitutional republic is an efficient pathway toward eradication of oligarchism as a political force among nations. This alien intrusion must be expelled from the internal policy-making processes of the United States, and international institutions must be so reshaped that, wherever republican policies are attempted they are encouraged to succeed, and that wherever oligarchical policies venture they are crushed by the orchestration of their failure.

To this objective the full spectrum of resources of statecraft of the United States must be directed until such time as oligarchism has been eradicated as a perceptible force among nations.

To this same purpose, two general categories of undertakings are defined as priority objectives for the duration of approximately 50 years into the future. The first is a commitment to the advancement of the per-hectare and per man-year output of agriculture of the so-called developing nations to parity with improved levels to be reached in the presently industrialized sector 50 years hence. This is to be accomplished through aid of the industrial and economic-infrastructure development requisite to such indicated improvements in production of food. The second is a commitment to accomplishing during the same period of time much of the preparatory exploration of space leading toward successful colonization of space.

This is to be facilitated by the establishment of a new set of international banking institutions through which the equivalent of hundreds of billions of dollars of long-term credit are newly generated each year to fund purchases of long-term investments from capital-goods-exporting nations to accomplish high-technology projects of economic development in the developing sector.

The extension of credit and the investment in space science will cost the industrialized nations not a net penny, on condition these undertakings are properly conducted. The increases in per-capita productivity promoted by acceleration of technology will return to the exporting nations as much or more than tenfold the increased per-capita income than the costs of either extending long-term credit for exports or space-development expenditures.

The two categories of undertaking are interrelated. The spectrum of in-sight transformations in earth-bound productive technology includes many items which require assistance through scientific observations which can be made only in space. The per-capita wealth of mankind would therefore become less without large-scale space exploration than after deductions for necessary costs of such exploration.

The development policy will not oblige the United States to dictate large-scale economic-development projects to developing nations. We shall cooperate in fostering each and all sound development projects, as our means permit us to do so, and as reliable political partners desire such development. From that which is either merely incompetent or destructive of republican interests, we shall withhold our support. We shall develop and deploy our economic power to the effect of so influencing the international environment that sound republican endeavors prosper, and anti-republican ventures become ridiculed, despised, and sterile undertakings.

If some adversary shall attempt to prevent us forcibly from following such a policy, we are

prepared to crush that force. If our capabilities to this end are sufficient, and our determination sufficiently clear, only a foolish adversary maddened by the desperate state of his oligarchical cause, would even consider affronting us so. Meanwhile, our republican friends throughout the world shall know us to be true friends and reliable allies, and the forces of oligarchism shall shrink in fear from opposing us.

What better could sovereign republics desire from us? We cherish their sovereignty only less than we prize their republicanism. Do those nations not desire economic development? Do those nations not seek assurance that their enterprises of development shall be truly competent; would any of them desire that we encourage them to undertake a foolish project, or that we encourage them in what we know to be folly, merely to please a passing, misguided prejudice of their policy-making? They rightly require only the certainty of knowledge that it is the efficient intent of our foreign and military policy to promote the spread and world-hegemony of a system of truly sovereign nation-state republics, a true community of republican principle. If they desire other from us, they are in serious error on that account, an error we shall not foster either directly or by implications of our practice.

To this end, it must be our policy to seek collaboration among nations such as Japan and those of Western Europe in mobilizing long-term credit for export of high-technology capital-goods and engineering services for the needs of the developing nations. The implications of this 50-year undertaking enable us to adduce the broad requirements of our military and related economic capabilities. The logistics of such an undertaking, set in the context of foreseeable further advances in the technological state of the art, define the principal qualities and scale of capabilities we require of our military and supporting economic means.

Broad Outlines of Development

Empirical studies demonstrate that increases in national productivity correlate with exceptional agreement with rates of expansion and technological improvement of those features of economy which are usually aggregated under the heading of "economic infrastructure."

Analysis of this demonstrated correlation shows that the improvements of such infrastructure do not generally cause advances in productivity directly. The direct advances in productivity are accomplished by means of technologically advanced, generally more capital-intensive investments in agriculture and industry. The possibility of successful advances in agricultural and industrial entrepreneurial practice is delimited by the existence of an improved environment of infrastructure as the "climate" within which individual entrepreneurial ventures are situated.

For convenience, it is customary to assort the total composition of essential such economic infrastructure into two principal sub-categories. The first such sub-category is represented by physical improvements in the general organization of nature, such as highways, railways, canals, ports, energy-networks, fresh-water management systems, and public works essential to hygiene. The second sub-category focuses upon the development of the productive potentials of the population, through medical programs, programs of education, public libraries, and facilities promoting the popular experience with classical culture.

Consider the example of the Sahel region of Africa, the policy of development proposed by President Roosevelt. Two principal large-scale projects are outstanding. First, we must create one of the larger fresh-water management systems of the world, directing the surplus fresh water of the Congo watershed into the region around Lake Chad. Second, we require a high-speed railway system extended from the Atlantic Coast of West Africa, across the continent, to Djibouti. Around these two fixed reference-points of infrastructural development, all the other principal components are organized in a coherent fashion.

At the other extreme, among developing nations, we have the case of India.

India presently has the fourth-largest population of scientific and related professionals among all the nations of the world; if present rates continue, India will outrank the United States on this account by the close of the present century. The amount of the urban labor-force, generally perhaps more employable than present labor in Britain, is in the order of 60 million persons; the total number of members of households of this intrinsically modern urban labor-force is greater than the entire population of most presently industrialized nations. In the relatively more improved regions of India's agriculture, the program set into motion under Prime Minister Nehru makes India self-sufficient in basic food-supplies, on condition the existing levels of productive technology are nourished with adequate amounts of such essentials as fertilizers. Within a span of between 45 to 50 years of conservatively projected rates of development, India could produce then more annual output of visible wealth than the entire world produced in 1979.

In addition to an orderly expansion of employment of the urban labor-force in modern capital-intensive modes, India requires several large-scale infrastructural projects, so that the combined rates of industrial and agricultural development foreseeable can be realized in fact. Most impressive as an engineering project is the eminently sound and massively beneficial work of bringing the fresh water supplies of the great Himalayas under control. Much of this water must be moved into the southern plateau region; despite the costs of pumping included in this, the entire effort would be a net, large-scale producer of hydroelectric power. India also requires modernization of its transportation system, and very large increases in average per-capita energy production, chiefly through nuclear-energy modes exploiting the large reserves of thorium at the nation's disposal. (The thorium High Temperature Gas-Cooled Reactor is among the excellent devices for supplying both electrical energy and process-heat for that nation.)

The region around the Rio de la Plata in South America is among the potentially greatest agro-industrial potentials of the world today. The list continues so.

Energy development is crucial. It is currently estimated that industrialized nations today average about 35,000 kilowatt-hours per-capita produced, whereas developing nations run to about one-tenth that level. It is the modern form of heat-powered machine in industry which determines productivity. In agriculture, productivity per-hectare and per man-year is dependent upon massive inputs of both industrial products and direct infusions of energy into both soil and farming operations. It is reasonable to project a required level averaging about 100,000 kilowatt-hours production of energy during the course of the decades immediately ahead. That standard of per-capita energy-consumption will be the rough measure of the level of economic development possible in today's developing nations.

No significant portion of this increased requirement could be met by so-called renewable sources, such as direct-solar applications or combustion of biomass. Increased levels of consumption of biomass would cause a monstrous ecological global catastrophe, including ruinous effects on weather-systems and desertification. The percentile of the earth's surface required to increase appreciably energy-capture by solar collectors would not only have hideous ecological effects, but the intrinsically low energy-flux density of solar radiation means that solar-energy collection must always be at least 10 times as costly per kilowatt as any competent mode of use of nuclear or fossil fuels.

Excepting the case of MHD modes of generation of electricity from fossil-fuel combustion, the intrinsic efficiency of fossil-fuel production of electrical energy is only about 15 percent the potential of fission-energy production, whereas future fusion-energy sources are potentially a trillion times more efficient in terms of energy-flux density than either fossil or fission programs. In general, the level of technology possible is defined in terms of upper limits by the relative energy-flux density of the primary heat-sources used. So, the chief sources of increased energy-supplies world-wide must come from a combination of high-heat hydroelectric projects, fission-

energy production, and, beginning the close of this century, fusion-energy development. Fossil fuels will shift progressively toward becoming a petrochemical raw material.

Leave solar-collection alone. Solar radiation should be relegated to its practical uses in shaping our weather-resources and the production of usable forms of biomass. The only intelligent way to consume solar energy artificially is by increasing the production of desirable forms of plant-life.

Energy, water-management systems, and transportation infrastructure already suffice to define broadly the global civilian-economy requirements of development. These same parameters define to a large degree the combined civilian capabilities and peaceful use of military capabilities to be projected in the relevant functions of our military general staff.

For example, the world requires urgently an upgrading of the standard design of shipping containers. The handling of grain for both domestic and foreign-trade consumption is a task which illustrates the point. Grain should be cleanly poured into standard containers on the farm, and only the container itself handled as a unit thereafter until the shipment of grain reaches its final break-bulk destination. Containers for this and other uses must be shifted from one mode of transport to another probably several times during their handling in foreign commerce: among truck, rail, barge, air, ocean-vessel, and so forth. The efficiency of turnover from one mode of transport to another is of concern. The development of trucks, rail systems, inland waterway systems, air-freight systems, ocean-vessel systems, and of storage and handling among systems must be standardized world-wide.

With aid of such deliberations, the United States must develop a U.S.-flag fleet of nuclear-powered ocean vessels. Port designs and other obvious correlatives must be taken into account.

Throughout the treatment of the list of matters bearing up this area of infrastructure, what is developed to meet definable civilian needs is a definition of the potential military needs within the scope of what is both possible and required. The making of peace and development and maintenance of the capacities for war-fighting are overlapping republican enterprises, defining the corresponding participating role of the military general staff. If one reckons the ratio of combat activity to logistics in modern warfare, the greatest portion of war-fighting, is using the existing arsenal of ploughshares as swords.

We won the last World War by mobilizing our potential as an exporter of industrial and agricultural goods. This was the foundation of our mobility and firepower, the heart of our war-winning capability. After the war, we committed a great error, both in terms of civilian economy and long-term military capabilities, by keeping the ratio of export of visible goods to total product very low, relative to the comparative standard of present ratios for the case of West Germany and Japan. We have lost thus our intrinsic military mobility, our ability to move combat firepower and supporting capabilities to wherever such may be required. We are confronted thus with the proposition to remedy this at large costs in terms of specifically military expenditures, whereas we should have the bulk of this capability available, at virtually no military cost on that account, as reserve capacity of self-paying civilian activities. Again, the folly of setting military mission-capabilities in a separate compartment, apart from statecraft as a whole, demonstrates itself.

We have so, on this account, once more repudiated in practice the very essence of a republican military policy, the development of the intrinsic superiority of a technologically progressive republic per-capita over any oligarchical power of approximately equal magnitude. We have so lost sight of the proper developing of war-making capabilities as a subsumed feature of peace-winning capabilities.

It is on such grounds that republican military policy places the responsibility for deploying an adequate civilian maritime fleet under military general staff responsibility. Since the French 18th-century department of bridges and roads, similarly, a large military corps of engineers engaged in essential works of peace is part of the responsibilities of a military general staff.

Although we may prefer to keep civilian scientific research out from under military-security housing, the fostering of adequacy in the spectrum and scale of civilian research and development of a nation is a responsibility of a military general staff, as the Prussian general staff proved its wisdom on this point in supporting the efforts of Alexander Humboldt and Lazare Carnot.

Space Development

The keystone feature of this present report, space-based anti-missile beam-weapons systems, ought to be recognized as illustrating a far broader principle of both civilian and military policy-making. Had we not taken down much of our scientific capability, beginning 1966-67, and had we adopted tasks of development clearly foreseeable at that time, we could have had such anti-missile systems in place before 1980.

Had we continued with the projected manned space-station, and had we accelerated broad-based research and development in the development of controlled thermonuclear processes, continuing to increase our employed scientific and engineering manpower at rates implicit in post-Sputnik programs, everything required for developing and deploying such an anti-missile system was already implicit by the mid-1960s.

The same applies for advances in civilian technology. According to the standard chemical handbook, a cubic mile of the earth's crust contains most of the minerals the human race presently consumes during a year. We do not use up the stock of minerals at such a rate; most is sooner or later returned to the environment as waste. With heat-sources of sufficiently high energy flux density, there is no limit to the supply of economical raw materials—taking ultimately into account our increasing access to space. We require, essentially, merely sufficient supplies of low-social-cost, high-energy-flux-density heat to "boil" primary or sedimentary rock into a plasma, and technologies for "distilling" from such plasmas the desired separations.

Even that happy view of our prospects is defined much too narrowly, much too conventionally. During the present century, the combined impact of the work of Riemann for physics generally and Pasteur for biology has pointed our attention to the fact that man has it within his means to create new "structures" in the universe, new states of organization of matter not previously existing in that universe.

This is excellent Judeo-Christian science. Contrary to heathen cosmogonies, the universe was not created in a "big bang." Rather, as rigorous scientific evidence corroborates Philo of Alexandria on this point, the universe is a never-ending process of continuing creation. Necessarily, prior to the present state of the universe, the universe existed in a different form, with different special kinds of laws pervasive throughout that earlier universe.

Philo and Apostolic Christianity adopted Plato's conception on this point. Philo stated the point in theological terms. If God were to have created the universe in a single "big bang," and if God were perfect, then the laws embedded in that creation would necessarily be perfect laws. Then, at the instant such a God applied his omnipotence to create such a universe, such a God became impotent to intervene in that universe's developments thereafter. If God is omnipotent, then the universe is undergoing changes in its apparent laws, and perfection is located not in those apparent laws, but rather in the perfect lawful principles which order the transformations subsuming the successive states of creation.

So, concurred Philo and Christianity, the omnipotent universal personality of continuing creation and the lawful principles ordering the successive transformations of continuing creation are one and the same substance: *consubstantiality*. To the extent man adduces those higher principles of creative transformation of the universe from relatively lower to higher states of existence, man is shaping his will according to that Logos which is consubstantial

with the omnipotent, universal personality of the deity. Man, by so directing his willful self-development makes himself, in imitation of Christ, the conscious instrument of the deity, doing God's work in the universe.

This theological overview of the matter was translated into the terms of proven principles of science through a modern process begun with Cardinal Nicholas of Cusa during the 15th century, especially in Cusa's commentaries on Archimedes and related matters. Although Cusa was not the only seminal figure of science from that period, he is established in retrospect as the most important and most fruitfully influential. The founding of modern physics by Johannes Kepler during the first decades of the 17th century, the advancement beyond Kepler and Pascal by Leibniz, the development of thermodynamics and the modern theory of functions by the Ecole Polytechnique under Monge and Carnot, lead through the circles of Karl Gauss into a culminating point during the 1850s. That culmination is centered around an 1854 habilitation dissertation by Bernhard Riemann, in which Riemann summarizes a preliminary proof that the universe is composed as Philo had argued it to be approximately 19 centuries earlier. Supporting work by Karl Weierstrass and the rigorous elaboration of the geometric notion of transfinite numbers by Weierstrass's student Georg Cantor, rounded out those foundations of modern physics upon which all of the crucial scientific achievements of the subsequent hundred years have directly depended.

The cited case of Riemann's 1859 paper underscores the same principle. Although focused upon a more accessible question, the generation of acoustical shock-waves, that experimental design has the much broader significance immediately, of outlining a crucial experiment intended to prove the thesis of the 1854 dissertation, *On the Hypotheses Which Underlie Geometry*. In sum, the characteristic form of action by which the lawful composition of the universe is to be adduced empirically, is those aspects of processes in which the characteristic geometry of the process is increased by an order of at least one. This, from the standpoint of the geometry of physics, is precisely what is typified by Riemann's experimental design for creating acoustical shock-waves. The same principle is exhibited in the generation of new, higher states of matter in organized plasmas, such as so-called solitons.

In other words, this. The correct empirical discovery of the higher lawful ordering of the universe obliges us to focus our experimental inquiry upon the special, crucial examples in which a process is transformed from a lower to higher order of organization—what is called negentropy in thermodynamics. Once such higher lawful principles are so adduced, man proceeds next to introduce into the universe new, higher states of matter which, in some instances at least, the universe has not earlier witnessed.

The name for that kind of mathematical physics is best selected to be Riemannian relativistic physics. The general principles underlying anti-missile beam-weapons delivering shock are an illustration of that kind of physics. That is the highest level of advancement upon which we stand today.

The relationship of this to astrophysics (e.g., space exploration), and so to military policy, is most readily situated in these terms of reference.

The fundamental discovery of modern empirical mathematical physics was that achieved by Johannes Kepler's proof that the solar orbits were harmonically determined by laws independent of what might have been any previous position or multi-body interaction among the solar bodies as such.

The line of further exploration, contrary to Kepler's method, associated with Newton through Maxwell and beyond, attempted to reject Kepler's work on precisely that crucial point. Contrary to Newton et al., the fundamental ordering of our universe is not determined by interactions among assemblies of particles, but by higher, "ground laws" of the general conceptual order explored by Kepler's initial effort in such direction. The recent observations

of Saturn by Voyager are merely fresh illustration of the bankruptcy of the direction taken by Newton on this point.

To sum up the working-point as briefly as possible, it is largely through following the example of Kepler, by seeking the laws governing physics on earth in the empirical domain of astrophysics that we break through the limits imposed upon research by earth-bound experiments alone. In general, it is by correlating the empirical domain of microphysics with the domain of the other extreme of scale, astrophysics, that we discover what are indeed more perfect formulations of the lawful ordering of our universe. Hence, if it were only for earth-bound practical scientific reasons, we must plunge into space as quickly as possible.

Our practical objective, most narrowly defined, is to develop new powers to create on earth states of organization of matter not previously existing in our universe. There, in precisely that direction, the new technologies of the coming century are to be found.

Less profoundly, but of direct bearing on policy-making, there is no ultimate weapon. There is no ultimate weapon of assault, against which a higher level of science can not fashion an effective counter-weapon. There is no ultimate weapon of defense, or deterrence, for which more advanced science can not fashion an overwhelming weapon of assault. The delusion, of clinging to thermonuclear weapons as the ultimate weapon of deterrence, has contended for a quarter-century to date to be the greatest lunacy ever tolerated in human history. So, as effective anti-missile defense systems point toward new categories of weapons of assault, the race to discover and deploy more powerful instruments of war must be run at winning speed as long as war itself is possible.

The chief instruments of war of the French forces of 1794-1814 were the world's most-advanced scientific-research institution of that time, the Ecole Polytechnique of Monge and Carnot, and the advanced industries and improved products of those industries made possible by direction of the Ecole Polytechnique. The military power of Germany was chiefly Humboldt and Göttingen universities, together with the industries whose development flowed chiefly from German science. These institutions shaped the capacity and willingness of a population infused with the influence of such culture to fight and win war.

Ever on, so, to the next frontier, to be the first to conquer that frontier and to move on to victorious assault upon the next beyond. That is the technological foundation for the capacity to win war.

The Human Infrastructure

The soldiers of a republic are each and every citizen physically and mentally qualified to bear arms. Apart from the relatively smaller military cadres and the professional officers-corps, the soldiers of a republic are found as students, at the work-bench, or wherever else civilian pursuits for winning the peace are encountered. Without universal military training, and an organized reserve based upon such training, a nation can not be viewed as serious about its own military defense.

Although the citizen's military skills and moral capacity to fight are conspicuous points, it is the quality of the citizen as a citizen which determines whether arms and military training can assemble those citizen-soldiers as a war-winning force. True, the small units of shock troops may have a relatively greater kill-capability than levies of citizen-soldiers, but no elite troops can win war against the resolute force of a well-led citizenry in arms. Once the attempted "blitzkrieg" by shock-forces has failed to break the assaulted nation, and once the attrition of continuing warfare in depth begins, it is the citizen-soldier who wins or loses wars, as we have known this or should have known this since Machiavelli addressed the matter of