The difference between LaRouche's and Teller's role in creating SDI

by Lyndon H. LaRouche, Jr.

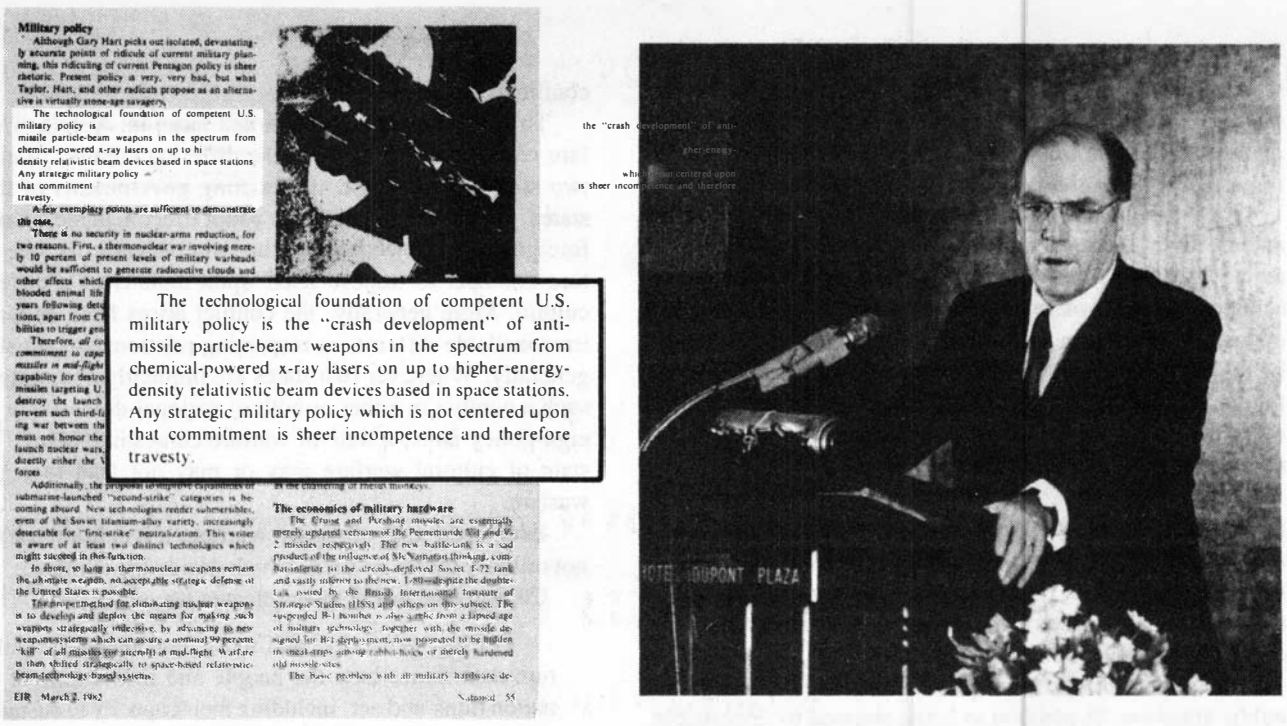
The fact that the Soviet government has successfully ordered a corrupt Department of Justice to violate savagely the human rights of my friends and me, obliges me to summarize my authorship of what is known today as the Strategic Defense Initiative (SDI). Notably, this Soviet demand was based on the Soviet perception of my authorship of SDI. The corrupt elements inside the Justice Department which authored the Leesburg raid of Oct. 6-7, 1986, are factional opponents of the SDI.

The authorship of SDI as presented by the President, is chiefly the combined work of Dr. Edward Teller and myself. Dr. Teller and his friends deserve the credit for the most important work on the physics side, whereas I am responsible for designing the overall policy employing these "new physical principles." The difference between the narrower scope of Dr. Teller's contributions, and my own broader considerations, is essential for understanding how a deployed SDI will actually function strategically, and is also key to understanding why the Soviets blame me most bitterly, rather than Dr. Teller, for authorship of this policy.

The version of SDI which President Ronald Reagan has repeatedly presented to the Soviet government, is an approach to strategic ballistic missile defense which I identified to the U.S. government during 1981, and first reported publicly at a Washington, D.C. conference during February 1982.

My February 1982 proposal won the admiration of a person then associated with me, Dr. Steven Bardwell, who worked through a preliminary design for a "layered" strategic ballistic missile defense, during the spring of that year. During the middle of 1983, Dr. Bardwell broke with me and SDI, because of massive personal pressure upon him by Soviet agents; however, his June 1982 report remains a contribution to the elaboration of an SDI.

Later, during the autumn of 1982, Dr. Edward Teller took up the cudgels for SDI. He and his younger associate, Dr. Lowell Wood, are chiefly responsible for promoting the physics side of the kind of design I have proposed. All the relevant indications are, that Dr. Teller's role was probably decisive in prompting the administration to adopt what has become known, since March 23, 1983, as SDI.



Lyndon LaRouche, speaking at Washington's Dupont Plaza hotel on Feb. 17, 1982, when he laid out the beam-weapons strategic doctrine. Inset: an article written at that time by LaRouche and published in the March 2, 1982 issue of EIR.

Since April 1983, my authorship of SDI has been increasingly obscured in the news media of Western Europe and the United States, although not, most notably, in the Soviet press. Since then, in the European and U.S. public, the meaning of SDI is usually seen as a matter of debate between the proposals of Dr. Teller and the "Rube Goldberg" scheme of Lt.-Gen. (ret.) Daniel P. Graham. Usually, those who support my policy in their private discussions, identify themselves publicly as supporters of Teller.

The question posed is this. Since I agree with Drs. Teller and Wood on their known SDI proposals, does it make much practical difference if my earlier authorship of the proposal is ignored in current discussions of the SDI? The answer to that question, is a very definite, very loud "Yes." Without those aspects of my proposal which Dr. Teller and his friends strongly, and wrongly oppose, the SDI would not succeed as a strategic doctrine.

These specific differences between Dr. Teller and myself, are at the center of what the Soviets themselves accurately describe as their motives for continuing a dialogue with Dr. Teller, while ordering the U.S. government to kill me. Therefore, while taking into account the very important areas in which Dr. Teller and I agree fully, there can be no competent understanding of SDI as a strategic doctrine, without stressing the differences between us.

The difference between Dr. Teller and myself, is essentially a matter of economic science, a long-standing, sometimes bitter controversy between Teller and me, dating from approximately a decade before March 23, 1983.

Drs. Teller and Wood agree fully with important parts of my contribution to the economics side of SDI. For example, Dr. Wood has supported publicly the fact that, using "beam-weapon" and related advanced technologies, the U.S. could kill a dollar's worth of Soviet missile for about ten cents, a support of the line of argument I presented during 1982. The U.S. government has adopted officially my argument, that the expansion of the U.S. tax-revenue base caused by "spill-over" of SDI research and development would contribute far more to national revenues than SDI itself would cost. Dr. Teller has made statements to the same general effect.

Despite these important areas of our mutual agreement on the economics of SDI, Dr. Teller rejects those principles of economic science upon which I based these arguments. He has so far rejected the most crucial feature of the design of SDI as a new strategic doctrine. By his failure to ally with me openly for more than a brief period during 1984, Dr. Teller has done great damage to our common cause. He is a lovable curmudgeon, an appellation which I hope I too would deserve, but he has a spoiling character-flaw, a flaw which bears directly upon his wrong-headedness on the subject of economics, and is the source of his embittered personal differences with me.

Were he and I to collaborate directly, we would reach agreement on all the technical features of SDI weapons-systems, about as rapidly as two curmudgeons might ever reach such agreement. We would probably come to agreement rather quickly on all the crucial features of design of both a Mark I and Mark II SDI system. He would probably attack me savagely, in his fashion, on some of my technical proposals, because that is his personal style. However, in

what he would propose, he would probably be right enough that I would agree to support his design specifications. In that qualified sense, we would probably come to agreement on all important matters of this sort.

So, at first glance, the areas of controversy between Teller and me might seem very narrow ones: his lingering personal animosity against me from the 1970s (over the issue of the economic "logic" of fusion-energy development), and his opposition to the principles of economic science. Admittedly, relative to the matters of designing a workable SDI system for deployment, we have no disagreement in principle. However, my strategic doctrine goes much further and deeper than merely a deployable SDI system.

So, putting to one side all the aspects of SDI on which Dr. Teller's position and my own are essentially the same, the area of difference between our SDI policies is an extremely important one. The difference involves life-or-death questions for the existence of not only our nation, but Western civilization as a whole.

It is important that this area of difference be brought to public attention, in addition to being stressed to responsible officials of the U.S. and our allies. This matter should be posed in the context of the question: "Why does the Soviet government demand that the U.S. kill me, because of my role in authorship of SDI, while the same Soviet government treats another author of the same SDI, Dr. Teller, almost mildly?" That question helps to expose the importance of the practical differences between Dr. Teller and myself.

The popular versus the competent definitions of strategic doctrine

The popular definition of strategy is a wrong one, by virtue of being much too narrow. The popular definition of strategy, like the popular definition of warfare, is limited to what is called "regular warfare." Since World War II, and especially since the late 1950s, the popular definition has been expanded to include what used to be called guerrilla warfare, under the Madison-Avenue-like slogan-name of "low-intensity warfare." The more general, more fundamental forms of warfare are ignored.

Insofar as SDI is defined as a weapon of regular warfare, in the popular sense of "regular warfare," there are either no differences between Dr. Teller and myself, or only secondary ones. It is when warfare is considered in its broader and more fundamental aspects, that there appear those very important differences which cause the Soviet dictatorship to fear and hate me more than any other living person.

I have supplied the correct definition of warfare in a published paper I have written as a complement to Professor von der Heydte's modern classic, *Modern Irregular Warfare* (*Die Moderne Kleinkrieg*). [Extensive excerpts are in *EIR*, Vol. 13, No. 39, Oct. 3, 1986, pp. 36-47—Ed.] Briefly, regular warfare is "the continuation of irregular warfare by other means," the deployment of military force as an arm of conflict between two cultures.

To sum up my argument in that location: A state of warfare comes into being when the differing cultures of either two states, or, at least, the existing governments of those states, causes the two states to adopt irreconcilable, implicit foreign-policy objectives. In the extreme case, the one culture attempts to impose itself upon nations of a different culture. More generally, the conflict arises from culturally irreconcilable differences respecting relations among states generally. Whenever two states are implicitly committed to such a conflict in either or both of national-domestic or foreign-policy aims, a state of warfare comes into being. This state of cultural warfare may or may not lead to regular warfare.

Even in the case of regular warfare, it is cultural warfare, not military means as such, which decide the outcome.

Culture operates in three relevant ways:

1) Most generally, and most fundamentally, culture determines how the people and institutions of a nation think and act, including their capacity to sustain warfare in all forms in the most adverse circumstances.

2) Culture is expressed most efficiently in the guise of the dominant institutions of a nation's private and public life, including churches, institutions of government, and the national economy.

3) The capacity, in depth, for conducting all forms of warfare, including regular warfare, is an elaboration of both the general culture of the nation, and of the institutions expressing that culture. Economic strength and means of regular warfare, are prominently included among these capacities in depth.

My standpoint in strategic thinking, upon which my design of the SDI is based, is global cultural warfare between the Soviet empire and those cultural principles of Western civilization upon which our Declaration of Independence, our War of Independence, and our original Constitution were based. In my approach to strategic doctrine, the means for winning a possible general form of regular warfare are but an extension of the means for winning the war without resort to regular warfare. In my approach, I start from the design for winning the peace, and develop a design of war-planning consistent with such winning of the peace.

From my standpoint, the design of war-plans must satisfy two requirements simultaneously. First, more obviously: We must anticipate the possible eruption of regular warfare, and must design a military instrument and economy assuredly capable of surviving and winning such a war with the relative minimum of losses to our nation and its allies, in the most rapid fashion, and by the minimum military exertion possible. Second, the preparations for possibility of regular warfare must be consistent with winning the cultural war by peaceful means, without resort to regular warfare.

It was the conjunction of these two requirements with

known technologies of warfare, which guided me to devise what has become known as the SDI. I did not start from the mere use of "advanced physics principles" for strategic defense. I started from the design of a strategic doctrine, and then adopted the SDI as a key element of the war-planning made necessary by that strategic doctrine.

The model I emphasized for my approach to strategic doctrine was the combined work of France's Lazare Carnot and the Prussian reformers, Scharnhorst, Wilhelm von Humboldt, and Freiherr vom Stein. Scharnhorst's work adopts all of the crucial features of Carnot's revolution in warfare, as part of a Prussian doctrine richer, and more developed than Carnot's. However, from the standpoint of the SDI, the most crucial feature of modern military science is the measures taken by Carnot during the period 1793-95 he served as the "organizer of victory."

To grasp the connection, it should be remembered, that Carnot assumed command of the military forces of France at a time, during 1793, when the defeat, occupation, and dismemberment of France seemed inevitable. During approximately two years, Carnot rebuilt and led the French military forces, effecting what became the greatest revolution in military science since the 15th-century developments in Italy and Louis XI's France. All of the later victories of Napoleon Bonaparte depended upon Napoleon's often militarily clumsy use of the greatest military instrument then in existence, the military instrument created by Lazare Carnot. (One should read the great von Schlieffen's *Cannae: The Principle of the Flank*, a work soon to appear in an English translation, for the best professional military assessment of Napoleon's relative mediocrity as a personality.) Compared with Frederick the Great, or Carnot, Napoleon as a military commander was relatively a slob, although, admittedly, vastly superior to such meat-wall tacticians as Wellington or Montgomery.

The foundation upon which Carnot's revolution in arms depended, was his design of France's war-economy, including such features as the massed deployment of relatively highly mobile field-artillery and new dimensions of mobility and firepower, in using rapid mobile development to demolish armies based on 18th-century "cabinet warfare" doctrines.

Movement and logistics of rapid movement, are the elements most characteristic of the orders Carnot issued during the critical 1793-1795 period. The late George Patton would have qualified as the model field commander in Carnot's eyes, and MacArthur as the ideal type for a general of armies. Unlike many misguided U.S. professionals, Carnot, Scharnhorst, and von Schlieffen, express an approach to strategy opposite to that represented by the famous Savigny's assessment of Napoleon's battles. Economic science is the key to deeper understanding of mobility and firepower. Thus, economic science, rightly understood, is the centerpiece of strategic doctrine.

Lowell Wood of Livermore Laboratory, who with Dr. Teller is chiefly responsible for promoting the physics side of the kind of SDI design LaRouche proposed.

By "economic science, rightly understood," we must understand two things, chiefly. First, we must understand an approach to economics, as economics, which adequately reflects culture more generally. We must be able to speak only the language of economic science, and yet be taking into account, implicitly, the relevant, non-economic sorts of key cultural factors. Second, we must define all aspects of regular warfare in the language of economic science.

On the second of these two points, mobility and firepower in military arms are interchangeable, as a matter of principle, with physical productivity in economy. This was the essence of Carnot's approach to a revolution in warfare.

Carnot, like his collaborator, and former teacher Gaspard Monge, was educated by the French teaching-order, the Oratorians, and thus imbued with the general economic doctrine of the great 17th-century organizer of modern economy, Jean-Baptiste Colbert, and also deeply imbued with the work of Gottfried Leibniz. The key to Carnot is expressed by the 1794 founding of Monge's Ecole Polytechnique under his sponsorship. The Ecole was a continuation of the work of both Colbert and Leibniz. Like the science institution, established by Colbert, where Leibniz founded economic science and developed the differential calculus, between 1672 and 1676, the Ecole was designed as a scientific institution based on Leibniz's economic science and physics, and committed to being a science-driver for the economy of France.

From its founding in 1794, until it was virtually de-

stroyed by LaPlace and Cauchy, beginning 1815, the Ecole was the world's center of fundamental scientific progress. The German preeminence in science and industry, which erupted around Alexander von Humboldt, Karl Gauss, and Lejeune Dirichlet, during the 1827-66 period, occurred as a direct continuation of the work of the Carnot-Monge Ecole. All U.S. scientific progress in the 18th and early 19th centuries came chiefly directly from France, and later chiefly from Gauss's Germany.

Soviet scientists are approximately as good as U.S. scientists, and far more numerous. Generally, we can not beat them in the science sector as such; we can beat them only on the production line, because of the cultural superiority of our labor force to theirs.

Although the principles of design of machinery and weapons were first elaborated by Leonardo da Vinci, and although the principles of the industrial revolution in powered machinery were discovered by Leibniz, the modern theory of technology of machine-design was developed directly by Carnot, Monge, and their Ecole collaborators. The work of Gauss and his collaborators, in creating the modern theory of complex functions and electrodynamics, was a revolutionary continuation of incompleted discoveries by the Ecole.

Physical productivity of labor, per-capita, expresses the relative power of a society, a culture. This is expressed as the ability of a society to sustain a large population at an improved standard of well-being in an average square kilometer of land-area. This increase of potential population-density is the economic measurement of man's increased power over nature, and, if need be, over other nations.

With certain implicit qualifications, regular warfare means chiefly the effective application of economic superiority of this sort to means of warfare. More broadly, such economic superiority is the essential correlative of a culture's power to win the peace. This does not mean that the nation with the more powerful economy necessarily wins the war; to win war, a superior economy must make effective military use of such potential. With that qualification, economic superiority is essentially decisive in war, and also in winning the peace.

This was not the entire basis for my design of a strategic doctrine centered upon the SDI, but it is the general setting in which my crucial principles are located.

At the close of 1982, I had occasion to present my design for the SDI to top military representatives of France. They wished to understand my design for strategic ballistic missile defense both as a project in which France might cooperate with the United States, and as a European undertaking attuned to the special war-planning needs of our European allies. Asked by them for my (1982 prices) price-tag on what is now called SDI, I informed them that I estimated a $200 billion price-tag for deployment of a first-generation multi-layered system of global strategic defense, and continued expenditures totaling to about $1 trillion (1982 U.S. dollars) by the end of this century.

One French military official exclaimed: "Your policy is technological attrition."

"Precisely," I replied.

What the French general meant by "technological attrition," was his recognition of the fact that what I was proposing was not one fixed system of strategic defense, but a rather rapid succession of technologically more advanced such systems.

In my strategic doctrine, I have designed SDI in a way which pits the crucial cultural superiority of our Western civilization, directly against the greatest vulnerability intrinsic to Soviet culture. I have pitted our labor-force's disposition for high rates of technological progress, against the more "traditionalist" instincts of the Russian peasant-mentality in Soviet industry. I have used both the experience of the 1940-43 U.S. economic mobilization, plus the experience of "crash programs" such as Carnot's, the German Peenemünde project, the Manhattan Project, and the Apollo project, to bring a most advantageous, additional dimension into play in our resistance to Soviet imperial aggression.

It is this aspect of my design of SDI which frightens the Soviet command to the degree that they fear and hate me more than any other living person. In our late-1982 and subsequent meetings, my French military friends were pleasantly amused by this obvious connection. Educated Europeans, especially from those patriotic families which have maintained devotion to the professions of military and statecraft over generations, have an immediate sense of history almost entirely wanting in literate Americans; from the same vantage-point, they understand the historical force of culture in a way which almost no American can. On that account, Europeans have often told me that I am one of the few Americans they recognize as understanding the world from a cultured European's standpoint. Hence, my insight into the role of technological attrition in strategic doctrine, infuriated the Russians beyond measure, and amused the relevant French.

I specified that we must develop approximately four successive strategic-defense systems over the 18 years, 1982-2000. The first, Mark I, would be a workable defense of

the sort we could assuredly deploy for limited, but strategically significant global defense within five years' work on a "crash program." The second, Mark II, would be an improved system deployed three to five years later, followed by an improved Mark III, and then a Mark IV. On condition that we did this as a cooperative undertaking with Japan and with our European allies, this schedule was a feasible one: Had the U.S. committed itself to a "crash program" immediately following the President's March 23, 1983 announcement, we would have a global strategic defense in place by approximately 1988.

The Mark IV strategic defense would eliminate all intercontinental and depressed trajectory Soviet missiles on the basis solely of the fact of the launching of such missiles. The response would be fully automatic, and destruction of about 95% of such missiles assured. Soviet missiles would be destroyed at launch, during boost, during mid-course trajectories, at descent toward target, and, finally, warheads eliminated in the near descent through modes of terminal defense. By assigning each of the layers of defense to "kill" at least 50% of the missiles or deployed warheads targeted by it, the desired kill-ratio of total missiles deployed would be achieved.

The Mark I strategic defense would achieve more modest kill-ratios, but sufficient to prevent a Soviet "first strike" from achieving a war-winning effect. This would deter Moscow from launching such an attack beforehand. Mark II and Mark III would be successive improvements.

Such technological attrition is indispensable to a strategic defense. Although the usual talk about Soviet countermeasures against SDI, from SDI opponents, is nonsense, there are sophisticated countermeasures which could be developed within a few years after any new system of defense is deployed. Therefore, we must replace Mark I with Mark II before Moscow has developed deployable countermeasures against Mark I, and deploy Mark III before Moscow could deploy effective countermeasures against Mark II.

Thus, although a good Mark I system, of the type my collaborators and I presented during 1982, could have been deployed by 1988, at a cost of approximately $200 billion (1982 dollars), the total cost by about A.D. 2000, would be in the order of $1 trillion (1982 dollars).

My strategic doctrine took SDI beyond pitting present levels of U.S. capabilities against present levels of Soviet capabilities. I shifted the equation, from fixed levels of technological capabilities, to pitting a high rate of U.S. technological attrition against a slower rate achievable by Moscow. Moscow lies when it asserts that SDI is a "first strike" weapon; however, Moscow has insisted, since the close of 1982, that it will resist U.S. deployment of SDI, because my design would ensure a growing margin of U.S. technological superiority over Soviet assault-potential.

Soviet scientists are approximately as good as U.S. scientists, and far more numerous. Therefore, in the matter of any military application of presently developed technologies, the Soviet military sector has a growing margin of advantage over us. Generally, we can not beat them in the science sector as such, at least not presently; we can beat them only on the production line, because of the cultural superiority of our labor force to theirs. Our industries can be geared up within a few years to the point our factories can assimilate scientific innovations at a high rate. Soviet scientists might match ours, but the Russian factory worker can not match the American, the German, the French, the Japanese, in ability to assimilate technological innovations rapidly.

It should be clear now, why I identify my strategic doctrine as a peace-winning doctrine.

My quarrel with Teller

The key question is: Exactly what was my own personal discovery in the design of SDI? It is in this area, that my quarrel with Dr. Teller's Lawrence Livermore has been a longstanding one.

The general feasibility of strategic defense against thermonuclear missiles was first identified by Soviet Marshal V.D. Sokolovskii, in his 1962 *Military Strategy*. At a time when the U.S. was concentrating on high-speed interceptor rockets (the 1962 system which Daniel O. Graham copied into his "High Frontier" program), the Soviet military was already concentrating research into lasers and other "new physical principles," more powerful than interceptor rockets. By 1969, when Henry A. Kissinger began pressing for an end to U.S. strategic-defense efforts, the Soviets had already begun development on systems of this sort, and had revealed this to the Pugwash Conference of which Kissinger was a member. By the middle to late 1970s, scientific proof of principle had been established for a wide range of "beam weapons" suited for such missions as killing missiles and their thermonuclear warheads.

In no sense, did I personally "discover" the feasibility of a "beam-weapons"-centered strategic ballistic missile defense. Ten years earlier, in the course of Henry A. Kissinger's treasonous role, in steering the U.S.A.-Soviet ABM treaty through the Congress and under President Nixon's pen, the signators to that treaty had explicitly stipulated that research and development of anti-ballistic-missile systems based on "new physical principles," was exempted from the general restrictions of the treaty.

All that I did, respecting the physics of strategic ballistic missile defense, was to bring together proven physics principles already worked out at places including Dr. Teller's Lawrence Livermore National Laboratory. I used the accumulated knowledge of such potential weapons, which I had assembled, bit by bit, over a period of about 10 years prior to 1982. I put these proven principles on the table, so to speak, and fitted them together as one assembles the pieces of a jig-saw puzzle. This aspect of my design deserves a pat

Dr. Edward Teller: a brief biography

Born in Hungary in 1908, Edward Teller went to Germany when he was 18 to study mathematics, chemistry, and physics at Karlsruhe, Leipzig, and Göttingen—and to escape the anti-Semitic regime of Miklós Horthy, which had ousted the equally repressive Hungarian Bolsheviks. In Germany he discussed the frontiers of physics with the leading physicists of the time—Arnold Sommerfeld, Werner Heisenberg, Erwin Schrödinger, Albert Einstein, Max Born, and Max Planck. Hitler's anti-Semitism interrupted these studies, and after a year in Denmark working with Niels Bohr, Teller came to the United States in 1935 to assume a professorship in physics at George Washington University. He brought with him his new bride, Mici, the younger sister of a close childhood friend.

During the Manhattan Project, Teller was involved in the construction of the first atomic bomb and is known familiarly as the "father of the H-bomb." After the war, he taught physics at the University of Chicago and then became asscíated with the new Lawrence Livermore Laboratory, first as a consultant and later as associate director until 1975.

Teller's theoretical work has been wide-ranging, from the structure of the nucleus, to fusion power, to peaceful nuclear explosions, to reactor safety systems. It is in the political arena, however, that Teller made his mark internationally as an advocate of a strong defense (as opposed to arms control), an opponent of classification in science, and a proponent of atoms for peace to raise the living standards in the developing sector. With his characteristic pungent wit, Teller told his biographers: ". . . I still believe that a physicist should be a physicist and not a politician, but I did become a politician, and I became one in self-defense. Now I know that self-defense, in some cases, justifies murder. Whether it ever justifies becoming a micro-politician, I don't know."

Because of his H-bomb "child," Teller was reviled by the liberal academic community as a warmonger who wanted to drop bombs on civilians, while J. Robert Oppenheimer, his boss in the Manhattan Project, is touted as the peacenik. In reality, it was Teller who counseled against dropping the atomic bomb on Hiroshima and Nagasaki, while Oppenheimer advised bombing Japan without warning.

Teller argued during and after the war for the development of the more powerful hydrogen bomb, because he wanted to push the technology as far and as fast as it would go for scientific reasons. He also knew that this was exactly what the Soviets were doing. Because he and his family had suffered directly under communist rule, Teller maintained a more realistic view of the Soviet empire and its arms control promises than his Pugwash colleagues. In 1953, Teller incurred the wrath of many fellow scientists and friends by testifying at hearings on Oppenheimer's security clearance that he thought Oppenheimer's postwar opposition to H-bomb development had delayed the development of the thermonuclear bomb about four years. Interestingly, these same scientists who ostracized Teller at that time, 30 years later opposed Teller on the SDI.

When asked, at a talk on beam defense at the Center for Strategic and International Studies in January 1983, why he made no mention of how a crash program to develop beam technologies would force a revival of the economy, Teller replied, "Economics is not my cup of tea."

on the back for excellent, persistent staff work, but does not represent my original discovery in any strict sense of discovery.

What I accomplished, as no one had accomplished this before me, was to prove the economic feasibility of a high rate of technological attrition in deployment of SDI. My proof of feasibility involved the following points:

1) Just as the Apollo Project had more than paid for itself through technological spill-overs into the U.S. economy, so the SDI would pay for itself.

For example: In my design, we would spend about $1 trillion (1982 dollars), in total, for successive deployment of Mark I, Mark II, Mark III, and Mark IV global strategic defense by approximately the year A.D. 2000. The net cost of this would be less than zero, because the increased tax-revenue of the federal government, generated by SDI "spill-over," would be far more than $1 trillion spent.

In this sense of SDI as "a commercial proposition," SDI is not an added expense, but is a sound investment, which will pay the government back several times more than the total paid-out investment.

We can spend for such SDI all day long, and be the richer, the more we spend.

2) Provided the overwhelming majority of SDI weapons is based on advanced physics principles, rather than Daniel O. Graham's technologically obsolete, and unworkable "kinetic-energy weapons," it will be far cheaper to kill a thermonuclear missile than to

produce and launch one.

One of the problems of kinetic-energy weapons, is that it costs more to kill an average missile than for the adversary to produce an added missile. Therefore, for these economic reasons, the adversary can supersaturate the defense with offensive systems and related countermeasures. To attempt to make Daniel Graham's "High Frontier" workable, on paper, we would have to spend at least 3 to 10 times as much as the Soviet cost for the missile-fleets they are deploying. In reality, the "High Frontier" system is a military farce: Since Graham's systems are based on low-orbiting platforms, they can be easily destroyed by Moscow a few seconds prior to Soviet missile-launch.

3) The superior economy and effectiveness of defensive weapons-systems based on "new physical principles," such as lasers, is that the mobility and firepower of such weapons is several orders of magnitude greater than that of both offensive and defensive kinetic-energy weapons.

Hence, Dr. Lowell Wood's estimate, that we can kill a dollar's worth of Soviet missile with 10 cents of such defense, is a fair ball-park estimate. Admittedly, SDI systems seem much more costly than offensive weapons, because they involve technologies much more advanced than those employed in constructing and deploying missiles. Set up a simple ratio, *K/C*, for which *K* represents the kill-ratio of the unit system in the beam-versus-missile domain, and *C* the cost of the unit system. *C* for advanced physical systems is approximately an order of magnitude greater than for kinetic-energy weapons, but the *K* of advanced physics principles is several orders of magnitude greater than that for kinetic-energy weapons.

4) Provided that the tooling developed for production of such strategic defense systems, is also used to produce capital goods for use in the civilian sector, and that high rates of capital-intensive investment of technologically advanced capital goods is promoted in physical production in the civilian sector, the growth of per-capita output in the economy as a whole will exceed the estimated 3% per-annum rate for the early 1960s period of post-Sputnik aerospace development. As a result, the increase of federal tax-revenues caused by such spill-over, will come not only to exceed the total expenditure for SDI, but soar way above it.

These economic considerations are at the heart of my new strategic doctrine. Without seeing the SDI as merely a necessary aspect of the implementation of that doctrine, the SDI could not be correctly, effectively understood.

With many aspects of these points I have listed, I have no doubt but that Drs. Teller and Wood agree. It is a matter of record, that they disagree strongly with the approach I employed to achieve these results. That is where they err. Although their contribution to SDI is enormously valuable, perhaps indispensable, they do not understand how SDI works in the larger framework of strategy.

This issue between Teller and me, on the one side, and between me and Lawrence Livermore generally, in the larger context, goes back many years, in two successive phases.

The beginning of the controversy was the early 1970s, over the issue of the rate of federal expenditure for development of controlled thermonuclear fusion as a primary power-source for mankind. Both Teller and we agreed, that this technology must be developed, but we disagreed strongly on the rate at which the program should be funded. He defended the position of Nelson Rockefeller's Commission on Critical Choices, with which he was associated, supporting a relatively lower rate of expenditure; we insisted on the maximum rate of expenditure projected by the federal energy agency. In the heat of this fight, we perhaps exaggerated the heat of our factional arguments a bit, and he more so. During the middle of the 1970s, I apologized publicly, in writing, to Dr. Teller, for the excessive heat on our side of the earlier debate; however, he still refers to that controversy with personal bitterness against me.

Nonetheless, we came into much closer contact with Teller's Lawrence Livermore, during the last part of that decade. This relationship was prompted by *New Solidarity*'s publication, on its front page, of a conceptual design for a thermonuclear bomb ["Implications of the Rudakov Disclosure, The Soviet Union Is on the Verge of a Strategic Weapons Breakthrough," by Uwe Parpart, *New Solidarity,* Vol. 7, No. 63, Oct. 15, 1976]. The issue was distributed at a scientific conference where Lawrence Livermore was well represented; there was turmoil in their ranks over this article.

What astonished Teller's friends was that we, with no access to classified materials, could generate a conceptually valid design for such a weapon. All we had done, was to apply the Riemannian physics of isoentropic compression to the problem defined. We had done this, not to reinvent the H-bomb, but to demonstrate to U.S. scientists, in this way, the proper approach to solving certain key problems of controlled thermonuclear fusion as a prime industrial energy-source. The reaction of many scientists to that article in *New Solidarity,* was "we have to take these people seriously in scientific matters."

The result of this encounter, was a two-faceted debate over choices of scientific method, between ourselves and many at Livermore, as well as other locations.

In the physical sciences, we advocated the geometrical method of Cusa, Leonardo, Kepler, Leibniz, Gauss, Riemann, et al., in opposition to the deductive-axiomatic, algebraic method of Descartes, Newton, Maxwell, Rayleigh, et al. In this connection, we stressed repeatedly the importance of work on advanced methods of mathematical analysis, derived from Gauss-Riemann elliptic theory, being

accomplished in Leningrad and Moscow, and warned that we would fall behind the Soviets in numerous strategically crucial areas unless we opposed the fanatical, uncritical defense of Newton and Maxwell, and turned to the geometrical standpoint of Gauss, Riemann, et al., instead.

The same issue of method was at the center of our disputes over economics.

Like many European and U.S. scientists today, our critics at Livermore were of the type which abandons all semblance of scientific method the instant the magical name of "economics" is invoked. In physical science, they are rational and rigorously so, even when they are sometimes mistaken. Mention the word "economics," and they react to that word as if by post-hypnotic suggestion, and are transformed into fanatically irrationalist ideologues of Adam Smith's persuasion.

In particular, vis-à-vis our work, they refused beyond reason to accept the fundamental fact, that economic processes are essentially physical-economic processes, rather than monetary processes, and also refused to consider the fact that physical-economic processes are elementarily nonlinear. In fact, the most characteristic feature of physical-economic processes is an ordered succession of nonlinear phase-state changes. This ordered process is of the form implicitly defined by Riemann's 1859 paper "On the Propagation of Plane Air Waves of Finite Magnitude," the paper on which the Soviets based their successful design of an H-bomb. That latter, is a matter in which Dr. Teller and his collaborators ought to be well versed. They had but to apply Riemannian H-bomb theory to the case of physical-economic processes, and their agreement with our general argument would be assured.

For that reason, Dr. Teller's circle rejected our strategic doctrine respecting use of SDI, although they independently concurred with some of our important economics conclusions. They have so far refused to recognize that strategy is properly premised on cultural-economic processes. They refuse to view physical-economic processes as physical processes, in these terms of reference.

That is the essence of Teller's quarrel with us, insofar as their statements and other actions show their motives to us.

How the SDI is intended to work

My conceptual historical reference for an SDI-centered strategic doctrine, has been the 1793-1815 work of Carnot's and Monge's science-driver institution, the Ecole Polytechnique. My fundamental discoveries in economic science have made it possible to express the principle of that Ecole's success in mathematical-functional terms of measurement of cause-effect relations within physical-economic processes.

Broadly, my economics doctrine is a continuation of the work of the founder of economic science, Gottfried Leibniz, and of the incorporation of key features of Leibniz's discoveries in Treasury Secretary Alexander Hamilton's "American System of political-economy." In Eastern Establishment jargon, I am "a neo-mercantilist." The central feature of Leibniz's discoveries in economic science, is his preliminary, rigorous definition of the concept "technology." It is in connection with "technology," that my own original discovery is located.

What I have done, is to reject the Clausius-Maxwell-Helmholtz-Boltzmann, statistical doctrine of "entropy" and "negentropy," and to define "negentropy" in a non-statistical, classical way. My point of starting-reference for this was my rage against the bestiality and fraud of the "information theory" dogmas of Professors Norbert Wiener and John v. Neumann. I have adopted the discovery of the collaborators, Pacioli and Leonardo, as adopted by Kepler, that all living processes are distinguished from non-living by a single, elementary geometrical principle: harmonic orderings congruent with the Golden Section of elementary constructive ("synthetic") geometry. Kepler constructed and essentially proved this principle, by deriving the entirety of his mathematical physics from this principle alone. Karl Gauss later proved the unique validity of Kepler's approach, relative to Descartes and Newton, and based his own fundamental contributions to mathematical physics upon that proof. This principle, defined geometrically in a classical way, is my definition of "negentropy." In other words, "negentropy" is a self-subsisting principle, not a Boltzmannian statistical variation in an overall entropic process.

The negentropy characteristic of the healthiest state of a living process, is also the harmonic characteristic of a healthy economy. This negentropic ordering of successive phase-changes in economic processes, as physical processes, is caused by mental activity of the same form as valid fundamental scientific discoveries in physics.

This class of mental activity is my definition of "reason," as opposed to the definition of reason as "formal axiomatic-deductive logic." This distinction is not peculiar to me, of course; it is the traditional Platonic-Socratic definition of reason, and also the definition of the form of the Logos, "Holy Spirit," in Christian theology.

Reason, so defined, is negentropic. This mental negentropy, is the cause of negentropic harmonic orderings in the growth of healthy physical economies. We call this result, otherwise, technological progress in an energy-intensive, capital-intensive mode.

My fundamental discovery, was to recognize that the cause-effect relationship between reason and healthy economic growth, is an intrinsically measurable one. The form of reason associated explicitly with scientific discovery, is subject to mathematical analysis, on condition that the proper standpoint in constructive geometry of the complex domain is employed. This is not possible within the confines of an axiomatic-deductive form of mathematics, such as a formal algebra.

Most of the wild, metaphysical kookery generated in the name of explaining away the mysterious unknowns of physics, are easily shown to be the result of attempting to interpret the universe from the vantage-point of an axiomatic-deductive form of mathematical logic. The most crucial features of physics, as typified by the fundamental constants, are all of a class which can not be accounted for by such a logic. Thus, for the same reason that Descartes's mechanistic physics led him to mystify reality with his *deus ex machina,* everything which can not be subsumed by formal logic, is argued, *ipso facto,* to be therefore exhibition of some mystical principle leering from between the cracks of the logician's universe. Gnosticism, or sophisticated Sufism, including astrology, cabbalistic numerology, and other satanic practices of witchcraft, is based entirely on this sort of formalist argument: "You see, this is a mystery, which logic can not explain!"

Like many European and U.S. scientists today, our critics at Livermore were of the type which abandons all semblance of scientific method the instant the magical name of 'economics' is invoked. . . . For that reason, they rejected our strategic doctrine respecting use of SDI, refusing to view physical-economic processes as physical processes.

Having once made this discovery, out of my commitment to refuting Wiener and v. Neumann's "information theory" atrocity, I was left with the need to discover a particular elaboration of geometrical physics appropriate to this task. By way of work on Georg Cantor's analysis of transfinite orderings, I was led to a correct appreciation of Riemann's work. Thus, Riemann's mathematics, added to my own original discovery, provided the general form of a feasible solution, for the task of measuring the cause-effect relationship between mental generation of new technologies and their nonlinear form of effects on the physical-economic process. (Hence, "LaRouche-Riemann method," rather than "Riemann-LaRouche method.")

By situating the work of the Ecole, notably that of Fourier and Legendre, as begging the more advanced standpoint of Gauss, Dirichlet, Weierstrass, and Riemann, it thus became possible to reduce the effectiveness of the Ecole as an "economy science-driver," to the required mathematical form. The work of Gauss, et al., in identifying the inadequacy of Fourier Analysis, and supplying the needed correction for that inadequacy, is not only key, but indispensable.

Over the decades since my 1952 discovery, my work in economics has been centered programmatically, on developing an "economy science-driver" tactic for reversing the devolutionary slide in progress in the U.S. economy since the mid-1950s. My institutional approach has been to devise some combination of private and governmental science-driver mission-assignments, through which the frontiers of scientific discovery could be brought directly to bear, effecting the highest possible rates of technological progress in the economy generally.

My early-1970s quarrel with Teller reflected this. For reasons of the physics of thermonuclear fusion, that technology represents not only an abundant, urgently needed energy-source; the physical characteristics of fusion, very high energy-density cross sections, and relative coherence, are the indispensable source of orders of magnitude of increase of productive potential. It was therefore abominable to me, considering the extent and increase of vast misery on this planet, that a capable leading scientist, such as Dr. Teller, should lend his voice to a lower level of commitment to fusion development than the federal energy agency had indicated as possible. I saw urgency for a "crash program" approach to the problem of development; Dr. Teller counterposed what was relatively a "business as usual" level of commitment.

This determined my approach to the problems of strategic doctrine. My primary point of departure was cultural warfare: the use of "economy science-driver" methods, to lift the Western world, including the developing sector, to the highest possible rates of economic growth. The approach to military capabilities must be subsumed by, consistent with, that same "economy science-driver" method.

As I have already indicated, those technologies which yield the highest rates of per-capita (physical) productivity in civilian production, are the only available technologies to provide greater firepower, mobility, and depth, per-capita, to military capabilities. The reverse is, of course, also the case.

Vis-à-vis the Soviets, the crucial question was not the relative current levels of technology and gross output of the two superpower economies. The crucial question was the highest rate of growth of physical productivity. So, rather than basing strategic doctrine on some designated "off-the-shelf" sort of technology, the task was to adopt the optimal pathway of rapid technological progress. In other words, to emphasize only those forms of technological progress which bring into practice most rapidly, the most advanced work on the frontiers of fundamental scientific research.

As I have indicated in many published items, there are precisely four lines of research and development today, which are the sole principal pathways to the highest possible rates of increase of physical productivity, and of the greatest rela-

tive firepower, mobility, and depth per-capita of military capabilities. 1) Controlled plasmas of very high energy-density cross section, and relative coherence, as typified by controlled thermonuclear fusion. 2) Directed coherent forms of radiation, especially those of very high energy-density (self-focusing) cross-section on target. 3) Optical biophysics, the application of Riemannian physics to living processes' most characteristic features. 4) Auxiliary improvements in computers and related control devices, needed to keep pace with the sensing by instruments, and to assist operators in controlling productive and other processes of ultra-high energy-density cross section.

My fundamental discovery, was to recognize that the cause-effect relationship between reason and healthy economic growth, is an intrinsically measurable one.

Any approach to military capabilities which emphasized technologies other than these four, would be sheer military incompetence. In warfare, any technology can always be overwhelmed by an adversary's effective exploitations of the potentials of a more advanced class of technology. Choosing any technology but the most advanced, is an obsession of accident-prone governments and commanders. There is no effective defense, but the most advanced defense. Since these four technologies exist on the frontiers, as the most advanced technologies for generations to come, no military policy but one based upon these could be competent defense.

So, starting from the general principles of my strategic doctrine, my military-systems problem was reduced simply to outlining the immediately foreseeable, practicable applications of these advanced lines of technological progress to the war-planning problem. The fact that these principles made the strategic defense physically and economically orders of magnitude superior to the offense, on principle, showed that strategic defense must predominate in our war-planning. In history, there has been an alternation of the relative advantage, from the defense to the offense, and back again. We have come, as a matter of science, to the prospective end of the superiority of the missile-offense, and the entry into the period of preponderance of the defense.

This strategic doctrine can not be understood as a strategic doctrine in the strict, classical sense, except as my standpoint in economic science is applied.

Winning the bigger war

The seemingly paradoxical feature of my strategic doctrine, is that, on the one side, it demands that our military policy (and budgets) be subsumed by a war-plan which ensures the survival and victory of the United States in case of Soviet attack. This is a sharp departure from the military doctrine put into place by Robert S. McNamara's "whiz kids," which has reduced U.S. military policy to a "Potemkin village" variety. On the other side, the essential feature of my strategic doctrine is, that it is a peace-winning doctrine much more than a regular-warfare doctrine. Am I, therefore, both a pacifist and a warmonger?

The problem is, that Soviet war-plans and ongoing irregular warfare against us and our allies are motivated by a deep cultural commitment, both a commitment to early world-domination by the Russian empire, and a commitment to eradicate every significant vestige of Western Judeo-Christian culture. No rational peace is possible between our two powers. Therefore, since the Russians are incapable of reason in this matter, durable war-avoidance can be secured by only one approach.

They will be deterred from launching war against us and our allies, only if the precalculable penalty they would suffer is far greater than they are willing to tolerate: "deterrence." They will give up their present war-plans, only if the deterrence is an absolute one, their assured ruin and postwar subjugation by us, should they attack. Therefore war-avoidance absolutely demands that we develop and deploy an absolute war-winning potential, even without ever intending to use this potential, unless they should attack us or our allies. In other words, absolute military containment of Soviet aggression for a more or less indefinite period ahead.

Hence, the use of classical war-planning approaches, to devise and deploy an absolute war-winning potential, is an indispensable precondition for durable war-avoidance.

However, to turn military containment of Soviet aggression into durable peace, we must observe a principle emphasized by Nicolò Machiavelli, in his commentaries on Livy. Always give a defeated adversary a safe escape from destruction. In other words, we must afford the Soviets the right to live in peace and prosperity within their proper national borders. Better than that, we should offer certain measures which will help them to improve their prosperity.

By this combination of measures, we must induce the Russians to prefer the normal national goals of a peaceable, sovereign nation-state, to the present imperial motives.

Over the longer term, our objective must be to win them to recognizing that Western Judeo-Christian culture is better for Russians than the present, Dostoevskian-Gorkyan cultural matrix. This depends upon establishing the point, that our culture is forever a more powerful culture than their present culture, and that they only injure themselves by failing to imitate ours. Since the ruling Russians do not recognize rea-

son, but merely a mysticism-dripping sort of formalistic logic, it is impossible to reach the Russian rulers solely by means of reasonable communication, or by any ruses of mere diplomacy. Irrationalists, such as those Russian rulers are, accept no premises in international relations but the combination of sheer physical power combined with the political will to deploy that power. It is therefore indispensable to define their cultural inferiority to them in these physical terms of reference, rather than the rational discourse which would be sufficient in dealing with men and women of reason.

Finally, the technical military side of the strategic equation is elementary.

French 18th-century doctrine is famous for pioneering in the application of projective geometry to analysis of the relationship between positions and fields of fire. The line of development of such geometry, from Leonardo, through Desargues, through Monge, is the proper foundation for teaching and study of elementary projective geometry today, an approach best referenced to Prof. Jacob Steiner's synthetic geometry for secondary-school pupils. Mastery of this standpoint of analysis of relative strengths of offense and defense is indispensable groundwork, but not adequate to modern technological forms of the problem.

We must extend the classical French military applications of projective geometry into the realm of the Gauss-Riemann complex domain. We must limit our approach to this complex domain to a purely constructive-geometrical one, avoiding interpretations grounded in formal algebra. Since a nonlinearly evolving physical-economic process can be mapped only in such a complex domain, the strategic question can not be posed in any other terms of reference than this one. However, the viewpoint is much the same as the 18th-century one, except from a higher level of reference.

In other words, instead of simply mapping the domain of warfare in Euclidean terms of reference, we must locate the efficient aspect of offense versus defense in the "hyperspace" of Gauss-Riemann physical space-time. For those who are deeply conditioned to imagine the Euclidean space of Descartes as the natural one, thinking in terms of physical space-time, rather than Euclidean space, takes some getting used to. However, once that viewpoint is mastered, all the essential topics are elementary ones.

My own work in economic science, has already accomplished a successful, if preliminary model for such analysis. Not only is this correct for offense-defense studies, as to form of analysis; because of the interdependency of physical economy and military capabilities, it is the only correct choice.

With many of the subsidiary points I elaborate in this way, Dr. Teller might either agree, or tend to do so. It is the method itself which he has rejected, at least to all appearances thus far. That is the key reason, my leading part as a participating intellectual author of the SDI must be kept in the foreground in U.S. policy-making today.