The Unclassified Mind: A Scientist Unlocks the Future

by Charles B. Stevens and Paul Gallagher

June 2—The technological advances of the Twentieth Century, "the Nuclear Age," were based on the scientific creativity of the Nineteenth, culminating in the broadly fruitful genius of Albert Einstein and Max Planck.

A leading scientist of the Twentieth Century who was both persistently creative, and strongly motivated by "the common aims of humanity," was also widely attacked by the century's scientific priesthood and before the public.

This was Dr. Edward Teller (1908-2003), the "father of the H-bomb," whose actual life's work was focused ("like a laser," as we have learned to say) on the principle that the completely open, unclassified pursuit of science's creative frontiers is the basis for both peace, and human progress.

Lawrence Livermore National Laboratory

President Reagan gives Edward Teller the National Medal of Science in 1983.

He thus became also a father of the Presidential science policy of Ronald Reagan which ended the Cold War—that policy known as the Strategic Defense Initiative (SDI)—and later a father of the Strategic Defense of Earth (SDE) against destructive space objects, now an essential aspect of the science policy of Russia, and a crucial potential for collaboration of American and Russian scientists.

In his earlier work as a nuclear chemist, within Einstein's legacy as mediated to Teller by collaborators of that great genius, Teller helped discover crystalline states which are now making tomorrow's high-temperature superconducting materials, so-called "Jahn-Teller metals."

Ironically, Teller's solitary and unstoppable decision in 1948 to pursue the secrets of "the Super"—a hydrogen-fusion bomb—stemmed from a commitment both to *prevent* nuclear war, and to launch open fusion-energy research competition and collaboration between the United States and the Soviet Union, creating the maximum rate of human progress of which each great power was capable.

Dr. Teller and Lyndon LaRouche worked separately from the 1970s, to bring about what became known in 1983 as President Reagan's "Star Wars" SDI. But the idea which both had, unique among all advocates of "anti-ICBM defense systems," was that the crash programs on the new physical principles involved in laser-based defense systems should be open, unclassified, and shared between U.S. and Soviet scientific teams.

It was *this* aspect of the President's famous Mar. 23, 1983 televised address announcing the SDI—sharing the research with the Soviets—which shocked and dismayed the cold warriors *of both sides*.

And the Soviet rejection of Reagan's offer, which was also Teller's offer, and which had been the offer directly conveyed to the Russians in advance by LaRouche, powerfully contributed to the Soviet Union's collapse six years later, despite the sabotage of the SDI itself by underfunding, and then non-funding.

'A Qualified Martian'

In remarks in late 2011, during the enthusiasm of *Curiosity*'s landing on Mars, Lyndon LaRouche appre-

ciated Edward Teller's creative generation of "science-driver" policies for Presidents:

> Those among us who have shared some knowledge of the kinds of scientific mission-orientation underlying the launching of the Strategic Defense Initiative (SDI) and kindred missions, who share it more or less immediately, as I do, or as do younger persons committed to this same legacy, can not overlook what I recall as Dr. Edward Teller's leading contributions to what became known by both of us as The Strategic Defense Initiative (SDI). We must also focus a mission-orientation commitment to the defense of Dr. Teller's leading role, in today's crucial goal of defending both the parts, and, ultimately, the whole of our planet Earth against what might be considered, in the rough, as space debris.
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> At the same time, we recall with some touches of bitterness, that minds such as those of Max Planck and Albert Einstein point us toward leading thinkers from [their] generation . . . who have represented something which tended to become lost in the course of what is recalled as World War I and post-World War II scientific and musical society. Much that had been beautiful as scientific achievement, became relatively mired in the cheap-shot qualities of practice which became all too familiar in the generation educated under post-World War II conditions. In effect, these, my own recollections, must also have often occurred to a qualified Martian such as my ironical sometime critic, Dr. Teller.
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> Dr. Teller is remembered with a particular emphasis on the subject of the SDI, and today's increasing concern for the need of means of defense against asteroids which have been, are, or may be deadly threats to large parts of the population of Earth, or, ultimately, worse. Those of my associates now, recognize that a very serious concern is needed against this general threat, especially in light of our stunning lack of knowledge respecting the awesomely great mass of potentially threatening asteroids whose identities we have yet to locate.
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> All of this which I have just presented as content within this present chapter of the report, now separates the practice of science prior to *Curiosity*, from the larger category which the success of *Curiosity* has prompted to be recognized as an entirely new and much greater pathway to be opened now, when the foothold of mankind on Mars has just gained an awesomely greater mission-objective in all conceivable respects.
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> The particular mission to which Dr. Teller had devoted particular attention—the threat to man on Earth from asteroids—should be long remembered, together with his famous mustering of efforts on behalf of the Strategic Defense Initiative (SDI), as the quality of humanity in science which the present threat of thermonuclear warfare demands of us all today.
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> With that, will come a further, very special concern of my own: the true meaning of the human mind.

'Science Drivers' and War Avoidance

When Edward Teller launched his single-handed campaign for development of the hydrogen-fusion or "thermonuclear" bomb in 1948, he was acting against a policy of continuing the brief 1945 nuclear war against Japan, with a "preventive" nuclear war against Russia. This was the policy of mathematician Bertrand Russell, whom LaRouche has rightly called "the most evil man of the Twentieth Century." Russell set it forth publicly in a chilling article in the *Bulletin of the Atomic Scientists* for Oct. 1, 1946, entitled "The Atomic Bomb and the Prevention of War."

Russell's title was sophistry: The article proposed to publicly threaten, and carry out if "necessary," a nuclear attack on Russia, to "prevent" the Soviet Union from breaking the U.S.-British atomic bomb monopoly. This "Strangelove" policy was agreeable to Harry Truman and to the Manhattan Project's most influential scientist, J. Robert Oppenheimer. It was based on the United States developing a stockpile of hundreds of atomic weapons during the late 1940s, while Russia had none or nearly none, and therefore winning a nuclear war either by a pre-emptive nuclear attack, or by Russian capitulation to the U.S.-British permanent atomic monopoly.

The successful detonation of the Russian atomic bomb in August 1949 in no way interfered with the implementation of the Russell doctrine, since it would take the USSR at least another five years to build a militarily significant stockpile of atom bombs. And General Eisenhower having held back from the Presidency in 1948, Truman was still in office, and ready to wage "preventive" nuclear attacks to which Eisenhower would never have consented.

Crucially, Russell and his co-thinkers were demand-

ing at the same time within the nuclear science community, that thermonuclear fusion research not be pursued at all; that nuclear science end with the fission process.

As Lyndon LaRouche has reviewed in detail, Bertrand Russell and his leading collaborators nearly succeeded in snuffing out science during the 1927 Solvay conference (see Albert Einstein's God). Among Russell's collaborators in this were J. Robert Oppenheimer and I.I. Rabi, who together are credited with bringing the "New Physics"—the anti-Einstein, anti-Planck so-called quantum physics—to the United States. This Russellite no-science policy was rescinded for a brief period in 1939, with the British support for the Manhattan Project to meet the Nazi danger. But with the end of World War II, the zero-science policy was re-implemented. Teller's 1949 crash fusion program was opposed.

U.S. National Archives

Hiroshima, after the August 6, 1945 dropping of the atomic bomb.

Teller, in the midst of the buildup for such a "preventive" nuclear war, launched a drive in 1948 for development of the far more powerful H-bomb—open-ended science, as he did not then know how such a fusion weapon could be made. It was also a mobilization, in the ranks of nuclear scientists, for a crash thermonuclear fusion program, as a science driver for technological progress. Most of the atomic scientists who, like Teller, were most enthusiastic to pursue thermonuclear fusion for endless energy for mankind, had also tried to stop the Hiroshima and Nagasaki bombings, and were in an uproar against Russell's preventive nuclear war proposal.

And they shared an opposition to classification of nuclear science work—weapons work included—in which Teller was to show himself bolder than any other over the next 40 years.

During World War II before Nagasaki and Hiroshima, Dr. Teller had brought the scientists' circular letter of his mentor, James Franck, to Los Alamos Scientific Laboratory.

Franck was a chemist colleague of William Draper Harkins, and those two had published a paper relating Einstein's famous general relativity equation, $E=mc^2$, to thermonuclear fusion energy, back in 1915. Teller wrote of Franck:

> Professor Franck was one of the two or three people who had the deepest influence on my own scientific development. I learned from him not only that most of the important things in physics cannot be described in a nonmathematical language, but also that mathematics is being used all too often to obscure the essentially simple character of the underlying ideas.[1]

The letter/petition Teller brought from Franck to Los Alamos in 1945, was a proposal to first carry out a non-lethal demonstration of the atomic bomb, for example, by exploding it high above Tokyo Bay, or in other ways demonstrating its power to Japanese leaders without attacking their people with it. J. Robert Oppenheimer, director at Los Alamos, intercepted the Franck letter before Teller could circulate it, and lied to Teller that "that much wiser people than ourselves in Washington" were seriously considering these options. Actually, as Dr. Teller learned much later to his great dismay, Oppenheimer led the Scientific Advisory Panel of the Interim Committee that forcefully put through the Churchill-Truman policy over senior military officers' objections: no demonstration; rather, nuclear attacks on cities.

Thus Dr. Teller's first attempt to prevent the use of nuclear weapons, along with such as James Franck and Dr. Robert Moon who organized "Concerned Scientists" at the Chicago Manhattan Project base, failed.

But Teller's second effort was, ironically, his push

1. Univ. of Chicago Special Collections, James Franck Collection, Box 24, Folder 23, Edward Teller notes in 1965.

for development of the hydrogen-fusion bomb in 1948, when the very influential Russell was organizing for a "preventive" nuclear attack on Russia.

In the narrowest sense, any significant weapons-design effort based on hydrogen thermonuclear fusion would require large-scale production of tritium, the heaviest isotope of hydrogen. This would immediately distract from the production of fissile fuel for the atom bomb stockpile required by Russell's plan.

More importantly, the possibility of an H-bomb could completely undermine the Russellite preventive-war strategy. Technically, even one thermonuclear fusion hydrogen bomb could have the firepower of a thousand "atomic" or fission bombs. Russia, to be specific, could transform overnight a militarily insignificant handful of atom bombs into a powerful nuclear deterrent.

Teller was thus demonstrating one of his core beliefs as a scientist—that classification, even the intensely compartmentalized classification of the Manhattan Project, was as fruitless as it was wrong: If a "super" could be done, Soviet scientists would do it. Russell's preventive war, therefore, was a recipe for absolute disaster for humanity.

The deeper question was whether unfettered scientific thinking would be permitted, to discover "science drivers" for human progress: Whether science which looked to the future, would survive the Twentieth Century and the supremacy of "mathematicians" like Russell who pronounced human knowledge to be arbitrary, and human population dangerous to the Earth.

Teller's primary goal was to develop new science and technology for the benefit of all humankind. Later, in a public speech in 1966, he estimated that thermonuclear and nuclear science and technology had advanced to the ability to support a human population of more than 30 billion at a modern standard of living. This had been the personal "driver" of his late 1940s campaign: to develop thermonuclear fusion—the decades-earlier vision of Einstein's collaborators—as the open-ended scientific leader for human technology.

'Open Laboratories'

The effort to develop the hydrogen-fusion bomb, "fathered" by Dr. Teller, opened one broad road toward fusion power: inertial confinement or "laser" fusion. The first laser was not invented until 1960 and was then of very low power. But Teller's discovery a decade earlier, for the H-bomb, showed how laser fusion would occur. His *hohlraum* design (a German word meaning "hollow chamber") effectively made the high-power

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Academician Evgeny Velikhov, Teller's frequent interlocutor, is today president of Russia's National Research Center at the Kurchatov Institute.

x-rays from the detonation of fission explosives packed around the hydrogen-ion fuel, into a tuned "soft x-ray" pulse, which compressed and heated the hydrogen-ion fuel into a far more massive fusion explosion.

After the H-bomb was developed, Teller threw himself into fusion power research in both the magnetic confinement and inertial confinement fields. What distinguished him was his attitude to the leaders of Soviet research in the field. Though his *hohlraum* design was deeply classified, he and his colleagues at the Lawrence Livermore Laboratory had public exchanges about it with leading Soviet researchers. Teller's belief was that Soviet knowledge in the field was, in the nature of science, every bit as advanced as his own, and that progress required "open laboratories" (his phrase) and a competition to develop the technological fruits of this "military" science.

In November 1976, Dr. Teller and the chief of the U.S. Magnetic Fusion Research effort, Edwin Kintner held, together with the leading figure in Soviet fusion research, Academician Evgeny P.Velikhov, a session at the American Nuclear Society annual meeting in Washington, D.C., on how to organize fusion research as the science driver for the common aims of humanity. The abstract of the discussion, given to the scientific media, said:

> Optimism is expressed on the prospects for success in practical fusion power by the end of this century. Controlled thermonuclear fusion through inertial confinement, magnetic confinement in Tokamaks, systems using lasers, relativistic electron beams, and magnetic fields are reviewed. Recent achievements in plasma heating and confinement are surveyed. Terawatt-output lasers, superconducting magnets, advanced materials, vacuum pumps, feedback control, and

improvements in targets, power sources, and fuelling are considered.

Seven years later in August 1983—just a few months following the shock of President Reagan's announcement of the SDI and offer of U.S.-Soviet scientific cooperation in developing defenses against nuclear ICBMs—Teller and Velikhov had another public meeting at the "Third International Conference on Nuclear War" in Erice, Italy. Despite the Soviet Politburo leadership's animus against SDI, and public fury against both Teller and LaRouche, Dr. Teller and Academician Velikhov agreed to jointly propose a U.S.-Russian magnetic confinement fusion experiment to be set up in Moscow.

Teller spoke of the "common aims of humanity" as being the aims of the SDI which he had promoted: Not merely the prospect of ending Mutually Assured Destruction with beam-weapon defenses against ICBMs, but the prospects of curing diseases, digging canals, transforming human communications, and exploring the galaxy with the "relativistic beam" technologies which would be developed.

LaRouche organized major conferences of scientific and military leaders all over Europe, in Japan, and in South America, and in the United States in 1984 and 1985, whose subject was precisely this idea.

Teller began, later that decade, to develop the idea of *planetary defense* (i.e., against the threat of devastation by asteroids) based on the same scientific work driving fusion research broadly, and the SDI. When the Berlin Wall fell at the end of that decade, proposals began to come from the Russian side for "open laboratories" for U.S.-Russian-European common work on science and technology for planetary defense.

This scientific cooperation—looking far to the future and far removed from what appear as "practical considerations" to most people—is today a major aspect of Russian science policy, under the rubric of "Strategic Defense of Earth." The Erice, Italy conferences with which Dr. Teller and Lawrence Livermore Laboratories were deeply involved, became the annual "International Seminars on Nuclear War and Planetary Emergencies."

Erice 1983: Reaching Out To the Soviets

An international conference in Erice, Sicily in late August 1983, was the occasion for Edward Teller to strike a major blow for U.S.-Soviet cooperation to develop strategies to prevent nuclear war. At the conclusion of the conference, Teller for the United States, Prof. Evgeny Velikhov for the Soviet Union, and Prof. Antonino Zichichi for Europe, signed a document which created a commission of 100 U.S. and Soviet scientists, dedicated to investigating the feasibility of defensive beam-weapons development, and to conducting a computer analysis on the effects of nuclear war.

Significant excerpts from the final communiqué, as published by the Rome daily *Il Tempo* August 24, under the headline "No to Deterrence Doctrine: The Erice Document," follow:

- The mutual exchange of ideas, data, and information, which resulted from the three sessions of the Eric international seminars on nuclear warfare, are of greatest importance for us.
- The previous sessions opened the path to new investigations of the global effects of a U.S.-U.S.S.R. nuclear clash, the results of which were discussed here in a climate of scientific rigor, and therefore objectively.... Such studies should be developed further with greater collaboration on an international scale....
- Another important point emerged during this third session, and is precisely the problem of defensive weapons. The underlying philosophy of this new point lies in the problem of studying the possibility of identifying new means for getting out of the present balance of terror. The first of these means is the reduction of nuclear arms. The second is the idea of new defensive weapons....
- It is therefore proposed to form a joint Europe-U.S.-U.S.S.R. research group, based at the Ettore Majorana center, for collaborative study of two above-mentioned points: 1) The simulation and evaluation of the global consequences of a U.S.-U.S.S.R. nuclear conflict. 2) A way out of the present balance of terror; and in particular, if it is possible to conceive of a new type of defense system against nuclear destruction.