

# Toppling the Tyranny of the 2<sup>nd</sup> Law of Thermodynamics

by Bruce Director

*Bruce Director, a member of the U.S. Board of the Schiller Institute, gave this speech to the Institute's conference in Berlin on Feb. 25. It can be viewed [here](#). The entire conference is or will be posted [here](#).*

It is clear from what we just heard from Lyndon LaRouche, Helga Zepp-LaRouche, and the others, that the future of mankind—whether we will face extinction in the very near period ahead, or whether we will launch a new renaissance, in science and in culture, that will take mankind places that mankind has never been before—depends on an act of will, an act of the human mind. This question, the issue that the human mind is an actually efficient power in and over the universe, is the central question, and always has been the central question of science. And it continues to be the central question of science today.

But we have a population, and a scientific community, which has been brainwashed to believe there are two universes: a universe of the mind, which behaves



EIRNS/Christopher Lewis

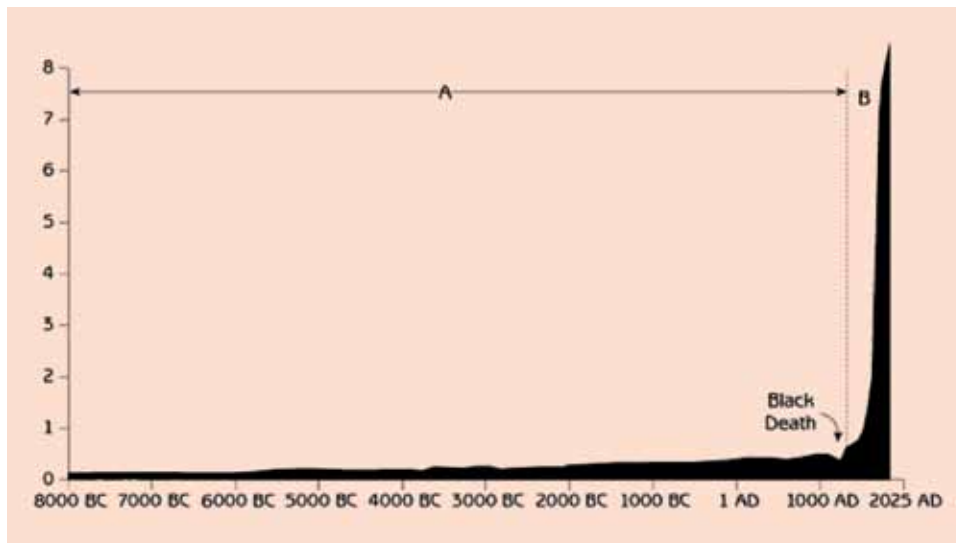
*Bruce Director addresses the Schiller Institute conference in Berlin, Feb. 25, 2012. "We have to abandon the Second Law of Thermodynamics," he said, "and put the creative minds of the scientific community to work, to elaborate the concept of an anti-entropic potential."*

in one way, and the rest of the universe, which behaves in a different way, and the two are not connected. This is a condition of clinical insanity, because the fact is that the human mind is an efficient power in and over the universe, and the kinds of insanity that we see dominating our culture, such as the Green movement, or the underpinnings of monetarism itself, of the belief in the power of money, are symptoms of the kind of insanity which denies the very central feature of the universe, which is the efficient power of the creative powers of the human mind.

What I and the subsequent speakers intend to do today, is to try and clear this question up for you, so that people can actually understand what we're facing. This centers really around the question of rooting out some of

the false beliefs which have been introduced into science, and into culture more generally, that are based on brainwashing people to believe that the power of the human mind is not an efficient power in the universe.

FIGURE 1  
**World Population**  
 (Billions)



Typical of this is an idea which was introduced into science in the middle of the 19th Century, known as the Second Law of Thermodynamics, which most people today may not even know anything about, or only vaguely. It wasn't a new idea at the time, but it was a new manifestation of an old idea, and it effectively became the central tenet of the official cult-religion of the British Empire. And today, even though people may not even know what the Second Law of Thermodynamics is, they adhere to it, sometimes with such fear that the mere mention of attacking the tenets of the Second Law of Thermodynamics, causes all kinds of reactions.

### The Human Mind vs. Aristotle

But let's first start with actually looking at what the universe actually is, the actual efficient power of the mind in and over the universe.

Some of you have seen this graph before (**Figure 1**), which shows the population growth of the human species, at least estimated, going far back. And you can see that there is a slow, but steady secular increase in the growth of the human populations. And then you see, towards the end of this graph, that there's a sharp drop in the population, which is denoted as the Black Death—the major collapse of population which occurred in the middle of the 14th Century. And then you see, after the Black Death, a huge, dramatic increase in

the population.

Now, what happened at that period? We obviously know that the biological characteristics of human reproduction did not change at that point in history. If you read Boccaccio, he clearly describes that people reproduced biologically at that time, the same way they do today! What changed was something in the human mind. What changed, led by a small group of people in the Renaissance, was the nature, the power of the mind in and over the universe: specifically, the rejection of the Aristotelean idea that the universe was essentially

fixed.

This is typified by Aristotle's cosmology, which is based on looking at the universe the way we see it from the standpoint of sense perception. You have the Earth at the center, and the planets moving around the Earth, and the stars moving around the Earth, and in this cosmology, as it's based on sense perception, you have an Earth in which everything is changing, and the further away you go from the Earth, the less things change. The argument of this cosmology is that the Earth is the least perfect, because everything is changing, and the further away you go from the Earth, toward the circumference, the less things change, and the less things change, the more perfect they become.

Which is a cosmology of an imperial system! It's a cosmology which was designed to justify a social organization that was organized around the idea of keeping everybody in their place, preventing new scientific discoveries, keeping people generally stupid, not allowing anything new to happen. And that organization of society rested on a false science, which said that this organization, this imperial order of society, conforms to the way the universe works; and the way the universe works, you can see, with your eyes and sense perception, is this idea of a fixed universe.

This thought, this belief, and this social order, is what caused the collapse of population in that period of the Black Death.

The reaction to that was an act of human will, of the power of the mind, especially led by Nicholas of Cusa, to revive the work of Plato, but also extended to assert and show that the universe did not conform to this false impression that one gets from sense perception. That it is actually organized the same way the human mind works; that the human mind is capable of making new discoveries of science, new discoveries about itself, discoveries of art, which add to our knowledge things which we didn't know before. And so, the ability of the human mind to change in a fundamental way, was a power of man that was reflected in the universe as a whole.

To put it succinctly, instead of the concept of perfection being a lack of change, a point of no change at all, the actual perfection was understood to be the self-perfectability of the universe, as reflected in the self-perfectability of the human mind. Or Cusa's concept of "learned ignorance," the ability of man to become less ignorant, and that this was an infinite characteristic.

And as a result of this, you had this excommunication of Aristotle from science. And the effort to reorganize society led to major breakthroughs in science and art, which is demonstrated by the huge growth in population. That this *idea* has an efficient power in and over the universe.

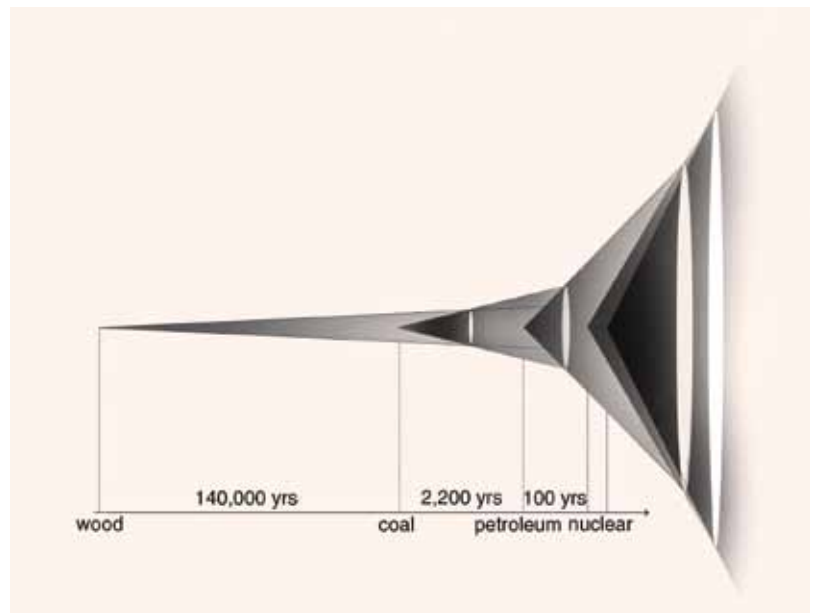
Of course, the Greenies will tell us that this was a bad thing; that the ability of mankind to exercise the power of the mind to overcome that crisis, that existential crisis, and produce the result that occurred, is something that in this crisis today, we should not make that mistake again. Instead, we should let that dip continue to decline.

### Increasing Energy-Flux Density

Now, that increase in population occurred through, as I said, new developments in science and art, which expressed themselves in economics, as an increasing power, per capita, of mankind in and over nature. And one of the most direct measures of that capability is an increase in energy-flux density. I think Sky Shields is going to address this in a little bit more detail, so I'll just go through it quickly.

**Figure 2** is a graphic which was put together by

FIGURE 2  
**Mankind's Energy Use**



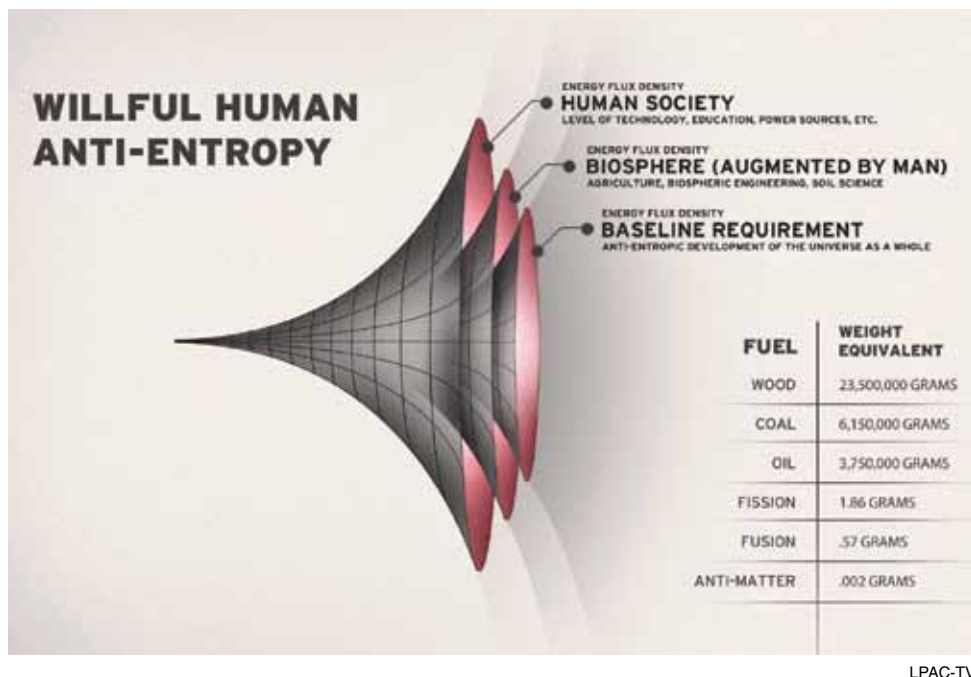
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people on the Basement Team. It shows the time period of the introduction of new energy sources, and you can compare this, in your mind, with the population graph you just saw. You see during that period in which you had a steady, but relatively slow increase in population, you had basically a continuation of the same energy source, of mankind. And after the Renaissance, the ability of mankind to harness these more and more dense forms of energy—energy of greater flux density, greater power per unit area—and the greater energy-flux density available in the economy, enables us to maintain expansion of the human population.

And of course, if we're going to do what Mr. LaRouche just discussed with us—that is, extend mankind's existence out to Mars and beyond—we're going to have to increase our population quite dramatically. And that requires an increase in energy-flux density. You can see the correlation between these two things. And this is very important, this question of energy and power, relative to the economy, for what I'm going to discuss about the Second Law of Thermodynamics.

Now, there's a sophistry which sometimes creeps in here, which says, "Okay, well, that might be illustrative of human activity, but, as the Greenies would say, that activity of mankind is working against the natural tendency of the universe." That is, when you get outside of man, the universe is tending in a different direction,

FIGURE 3



tending towards equilibrium, not tending towards growth and development. Tending towards lower states of organization of the system, not tending toward higher states of organization and existence. So the Greens may accept this as documentation of what mankind does, but they would argue that it's a violation of the natural balance of the universe. And nothing could be further from the truth.

**Figure 3** shows man's interaction—this again came out of the Basement team, the series of cones—and this is a heuristic device which shows the relationship of the interaction of human society with the biosphere, those parts of the Earth which are dominated by non-human forms of life, and the so-called abiotic domain, correlated with the type of increase in density of energy.

But if you look at just life itself, the study that has been done by Sky and the others on the Basement Team shows dramatically, that the actual characteristic of life itself, even before man developed, was exactly consistent with what we see later happening in human development. That is, throughout the evolution of living species, you see that the evolution occurs from lower to higher forms of species, which are all characterized by a biological equivalent of an increase in energy-flux density. And during that course of development, you have mass extinctions—we refer to the dinosaurs, but

there are many others—in which those species which do not have an increase in energy-flux density, those species were not able to sustain themselves, and they disappeared.

So, contrary to what Greenies will tell you, the characteristic of the evolution of life is consistent with what we see with human beings—which should not surprise a human being, but it might surprise a Greenie.

But the difference between other forms of life and human life, is that man makes this evolutionary changes through a willful act of the mind, whereas the other species evolve and de-

velop, but they have no control over their ability to adapt and conform. And at no point do you have, in this series of evolutionary developments, a situation where a lower species, a species with a lower ability of energy-flux density, takes over dominance from a higher species.

The direction of the evolution of life is irreversibly towards higher states of organization, not towards lower states.

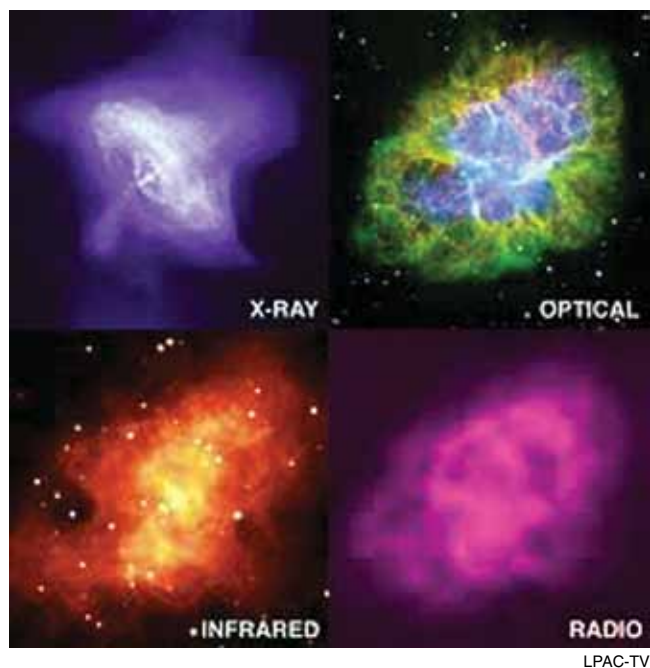
## Evolution in the Universe

But this is not limited to life itself. If you look at things which some people would say are abiotic, non-living, you see exactly the same type of process. Although I would argue that there is really no way to distinguish these divisions between abiotic, biotic, and life, and noetic processes; in fact, all three are interacting at all times in the universe. But if you look at something that's very far away—such as astronomical processes—that appears to have nothing to do with life, or is not being governed by living processes, or noetic processes, you see exactly the same thing.

This is a series of photographs of the Crab Nebula (**Figure 4**), which is one of the most interesting objects in the sky. These pictures come from different wave lengths in the electromagnetic spectrum. So you can see that the same object appears differently, whether you ex-



FIGURE 4  
**The Crab Nebula**



amine it through the optical band—which is the wavelength of the electromagnetic spectrum that your eyes are sensitive to—versus the x-ray, infrared, and radio, which are wavelengths which your ordinary sense-perceptual apparatus does not react to—at least, as far as you are conscious of. You’re actually reacting to them, and interacting with these wavelengths, even though you may not call it perception, because they don’t deal directly with your eyes. But more on that in a minute.

The Crab Nebula is hypothesized to be a remnant of an exploding star. It appeared as a big flash in the sky that Chinese astronomers noted in the 11th Century, and if it were conforming and behaving according to the principles of the Second Law of Thermodynamics, it should be just dissipating. A big explosion that just dissipates, and gets to a less and less and less state of order.

But you can even see in these pictures, just naively, that not only is it not dissipating, but it’s actually organizing higher and higher structures. And in fact, recently, as Sky noted, last year there were some gamma ray bursts, intense bursts of energy in the very high wavelength spectrum, the gamma ray spectrum, which emerged and dissipated so intensely and so rapidly, that they defied any explanation consistent with a process which was devolving toward a state of equilibrium.

And we see this in other supernovas. **Figure 5** is a

FIGURE 5



picture of what is believed to be the oldest supernova that we know of, another exploded star. And you see that even after a very, very long time, what appeared to be a big explosion is actually organizing new structures. We don’t understand what’s actually going on there, partly because the effort to understand these phenomena is clouded by the attempt to impose upon them a view of the universe consistent with the Second Law of Thermodynamics, instead of looking at it from the standpoint that these structures actually confirm what I said at the beginning: that the universe is inherently creative, and intrinsically organized towards higher states of organization and existence.

### **The Second Law: How We Were Brainwashed**

So, how did we get to this point? This point where, despite the irrefutable evidence that the characteristic of the universe is disposed toward progress, toward higher states of development, how did we get to the point where, to say such a thing, in either a popular discussion or in a scientific conference, is greeted with skepticism. And, in fact, the organization of our society, as I’ve already mentioned with the Greenie movement, or if you take just the financial system, in which all these fancy financial instruments—derivatives, credit default swaps, and so forth, which were invented over the recent years—were all invented in order to force the money system to obey the principles of equilibrium; to try and maintain an equilibrium in financial flows. And

the collapse of the financial system, and the collapse of the physical economy under the pressure of this Greenie movement, proves that the universe itself will actually crush any attempt to create a state of equilibrium.

So, how did this come about? That the universe behaves one way, and yet people are brainwashed so strongly, that they will organize their society according to principles which are exactly contrary to the way the universe works.

Well, let me give you a very brief history of how the Second Law of Thermodynamics was introduced. And when you see what a fraud it is, you'll be absolutely surprised that it's been able to achieve such dominance.

After the period of the Black Death and the Renaissance that emerged out of it, as I said, man with new ideas, and new concepts of the way the universe works, which were consistent with the view that the human mind is an efficient power of the universe, began to dominate, and as a result, you saw a huge increase in man's power in and over nature, through technology.

This occurred by the work particularly of Cusa, of Johannes Kepler, and also Gottfried Leibniz, whose work on dynamics, which elaborated the means by which man can understand the physical universe as an essentially creative process. Leibniz's work led to a new development in technology which was absolutely crucial for economy: the heat-powered machine. Now this was the first time that man had actually used heat as a form of power.

If you think about it, prior to the development of the heat-powered machine in the mid-17th Century, all of human economy was based either on muscle-power, animal or human, gravity power, or wind power. But now heat became a power source, and initially the view of heat was that it behaved like, for example, gravity. A water wheel powers a mill because the water falls under the force of gravity; the power of gravity pushes the water and turns the wheel. And heat appears to behave similarly, because it flows from the hot to the cold. And so the initial idea was that the power of heat comes from this inherent condition, where heat flows from hot to cold.

But here's a crucial difference between heat and my example here of the water wheel. Because while the



EIRNS/James Rea

*The Greenie movement insists that human development violates the natural "equilibrium" of nature. Nothing could be further from the truth! Here, anti-nuclear demonstrators in Berlin, Sept. 28, 2010. The banner reads: "The uranium has to stay in the earth!"*

water can flow from high to low, it can also be pushed back up again, which of course is the principle of how the water wheel works. But heat only flows in one direction. It only flows from hot to cold. You can't get the heat to flow back from the cold to the hot.

Now, understanding this process is crucial to being able to understand the efficiency of the heat-powered machine. Because obviously, to increase man's power over the economy, one wants to be able to construct the most efficient heat-powered machine, and to increase the energy-flux density per capita of mankind. And this is what Leibniz's studies involved, and it's also what was involved in the studies of Sadi Carnot, Riemann, Dirichlet, Fourier, and others—to actually try and understand exactly what *is* the nature of heat. We don't have time to go into this today, but let me just show you how this investigation was misused to create a brainwashing that you see today expressed in the Green movement, and in monetarism.

## Kelvin and Clausius: Heat Death

It actually probably began in the middle of the 19th Century, with the writings of Lord Kelvin, who initially was known as William Thomson, but probably because of his writings on heat, he was made the first Baron Kelvin of Largs by Queen Victoria, for articulating what became the center of their cult religion. And Thomson (Lord Kelvin) wrote many works on this, one called *On the Universal Tendency for the Dissipation of Mechani-*

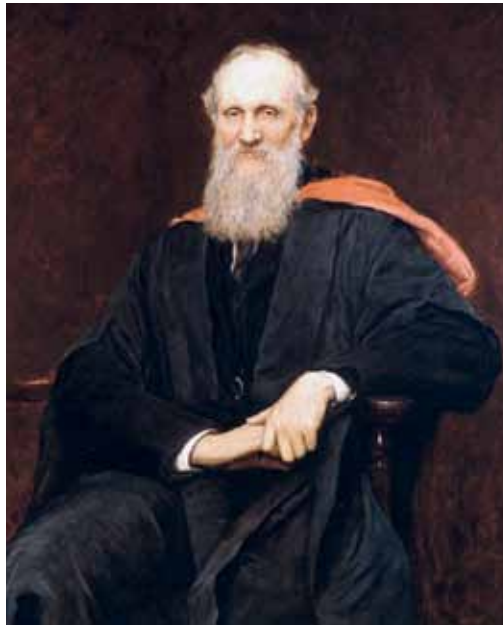


cal Energy, in which Thomson said: Since heat only flows from hot to cold, and always tends toward equilibrium, and since all action in the universe ultimately turns into heat, therefore all mechanical energy, all action in the universe, is going to eventually turn into heat; all the heat is going to flow from hot to cold, and ultimately go into equilibrium, and therefore the universe will inevitably come upon an ultimate heat death. In which all motion will stop, and everything will stop.

In such a conception of the universe, what is the meaning of human life?

What is the power of the human mind? Man might be able to make inventions and make discoveries, or compose beautiful compositions, but it's all meaningless, because ultimately, according to Lord Kelvin, the universe is going to die in an equilibrium heat death.

Now, of course, this is a pretty unscientific view, and it fell to Rudolph Clausius to actually try and come up with a more rigorous scientific concept of this ultimate heat death of the universe. So he wrote a book on heat and heat-powered machines, in which he basically reworked the ideas of Sadi Carnot, and he looked at this question of how, in a machine, you get this



Lord Kelvin (1824-1907), portrait by Hubert von Kerkomer.

dissipation of heat, and he coined a new term, because you can get a dissipation of heat without changing the amount of heat in the machine, and so he said there has to be a new idea other than energy. So he invented a word which he called "entropy." He wanted it, as he says, to sound as close to "energy" as it could. From the Greek word change (*trope*) and the prefix *en*: internal change. He asserted that this is a measure of the potential for change. And he gave it a mathematical expression, in which an increase in entropy was a decrease in the potential for change, and a decrease in entropy corresponded to an increase in the potential for change.

So, that's a little trick he plays, but then at the very end of this book

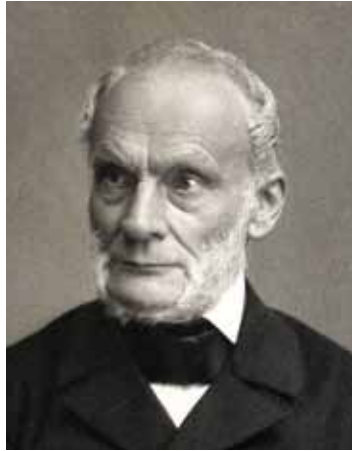
he makes the most radical assertion, without any foundation whatsoever, in two statements. The very last two sentences of his book on machines are: "The energy of



Kelvin's vision of the heat death of the universe was aptly foreseen by Peter Bruegel the Elder's "The Triumph of Death" (1562).

the universe is constant,” and “The entropy of the universe always tends toward a maximum.”

Now, on what basis does he make an assertion about the universe, from a narrow investigation of a heat-powered machine? It’s completely absurd. But that became, and has become, basically, as I said, a central tenet of a cult-religion, where people believe this; they will state it as a mantra, or believe it without any basis for realizing that they’re making a statement about the universe which is completely without foundation.



*Rudolf Clausius: “The entropy of the universe always tends toward a maximum.”*

### **Boltzmann: Probability, Not Causality**

Now, of course, because it was without foundation, it required that there be some kind of basis to say *why*. Why does the heat always tend toward equilibrium? What is the purpose of this? And nobody could come up with an actual causal reason consistent, for example, with Leibniz’s idea of least action, the curve of the catenary, or the pathway of the planet in a Keplerian orbit, which is a pathway that is determined because it’s the least action pathway with respect to the physical principles that are acting. No such formulation could occur to give a foundation for the Second Law of Thermodynamics.

So this task fell to Ludwig Boltzmann, who introduced into science a completely new basis for a foundation, which was the mathematics of probability. Equilibrium, according to the mathematics of Boltzmann, was a more *probable* state than disequilibrium. That is, a change from a higher state of organization to a lower state of organization, in which no more change is possible, because equilibrium is a state in which there is no more change—you can’t get more equilibrium than equilibrium! When you get to equilibrium, you’ve reached the end.

And so, Boltzmann said, that’s a more probable state—again, an assertion that has no foundation. It’s true that equilibrium doesn’t change any more, but why should that be more probable, than a state of disequilibrium?

And so, this introduced a new false idea, which was



*Ludwig Boltzmann: Man cannot know causality in the universe, only “probability.”*

that the universe was fundamentally random, and that anything that happened in the universe happened because it was more probable than were it not to happen.

Well, how is the composition of Beethoven’s Ninth Symphony a “more probable” event, than its non-composition? How is the creation of a great work of art something more probable than were it not to occur?

But remember the process we saw, with the development of mankind through new scientific discoveries, which, by their very nature, when they come into existence, prove that the way everybody was thinking about the world, is wrong. That

man’s future development depends on *only* the improbable, the improbable event that somebody will come up with a new creative discovery that proves the way everybody thinks is wrong. How, from that, do you get that equilibrium is the most probable state?

This, again, is the underpinnings of the Green movement: that anything man does disrupts the balance of nature; that somehow nature seeks a balance; that somehow the universe is seeking a state of equilibrium.

### **The British Imperial Project**

These doctrines are not just falsehoods that affect the design of machines, or academic scientific theories. These are false doctrines which were used by the British Empire, to build a political movement, a social movement, which was consistent with what else was going on at the end of the 19th Century. A pessimistic movement that was being pushed, to counter the optimism that was expressed by Lincoln’s victory over the Confederacy in the Civil War, and the achievement in the U.S. of a continental economy, and the spread of that to Europe, especially to Germany and Russia, and then into Asia, through Japan, in the second half of the 19th Century, a potential for what we want now: The development of continental powers based on increasing man’s power in and over nature through technology.



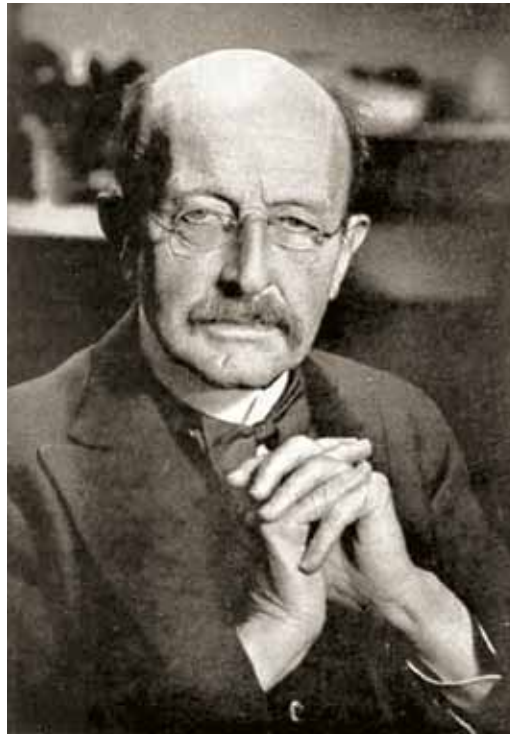
And the British wanted to destroy that, because that was obviously a threat to their Empire, a threat to the imperial system, which tried to maintain a balance of power, tried to impose an equilibrium on society. And so, the introduction of this false scientific idea was an essential ingredient to the maintenance of that imperial organization of society.

And of course, it led to the predictable result: The attempt to impose such an equilibrium, against what was in the best interests of mankind, led to the disaster that we now call World War I.

### Planck's Refutation

And this issue, as I'm stating it today, was spoken about on the eve of that disaster, by no less a scientific authority than Max Planck. Right here in Berlin, in August 1914, as the "guns of August" were mobilizing, he spoke at the Kaiser Wilhelm Institute, and addressed this question of the absurdity in science of accepting the idea of what today we would call the Second Law of Thermodynamics, as a universal law. Planck gave a rigorous investigation of it, showing the assumptions which underlie it. So that if a scientist is going to use a certain theoretical framework, the scientist has to understand, what are the underlying assumptions on which that theoretical framework is based, so as to avoid error.

And after giving this rigorous discussion of thermodynamics, Planck says that one cannot, however, apply any of these concepts to mankind. Because mankind is governed by moral law; and moral law, as Planck said, is typified by the question, "What am I to do with my life? As a mortal human being, what is my immortal contribution, not only to mankind, but how do I contribute something that expands the universe as a whole?" And Planck, and his collaborator Einstein, who also held this view, were bitterly attacked, because the pressure from the British Empire was to go back to the days before the Black Death. The Second Law of Thermodynamics had



*Max Planck: Concepts of thermodynamics cannot be applied to man, because mankind is governed by moral law.*

become the New Aristotle, the new fixed system, in which everything tends toward a greater and greater state towards equilibrium.

And Planck's insistence that science and man must be governed by moral law, not false doctrines, was antithetical to what science was becoming at the time, especially typified by things like the Copenhagen interpretation of quantum mechanics, which held, again, that the very fundamental characteristic of the universe was random and probabilistic.

Planck starts his speech by saying, "We don't know"—think about it, August 1914—"We don't know what's going to happen to us tomorrow." It's a very similar situation to where we're in today: We don't know if something's going to happen,

whereby we will lose our country. But the answer to that is not found in saying, "Well, what will happen will be whatever is the most probable thing." The most probable thing to happen to us, in the next few weeks, is to become extinct in a thermonuclear war! So, if you think the universe is predisposed to the most probable thing, that's what you get!

Obviously, human existence depends on, not the most probable, but on what appears to be the most *improbable*, which is something based on moral principles. And this means, in my view, that science actually has to develop a foundation of a new concept of an *anti-entropic* potential, a potential which characterizes man and the universe, as a tendency for development from lower to higher states of organization and existence, a creative principle.

Now, just parenthetically, this is also sometimes confusing, because of the term "anti-entropy." Because I've just described that the concept of entropy, as Clausius introduced it, is a false idea; so, why would we say, what the universe really is, is not what it isn't? And sometimes people get confused about the question of "anti-entropy." But because the concept of entropy and

the increase of entropy is ingrained, it's absolutely essential that we make the point in this way. However, I think that at some point, we have to have a positive term which actually defines, scientifically, this creative notion. I propose the term "dynatropy," from dynamic change. And we'll see if that ever takes hold.

But, this means that we have to have a concept of a potential, which has an intrinsic characteristic to generate a new potential. And there's much we can say about this, but I think the best way, at least, to get this concept across in this setting, is to first think about how the human mind works.

### How the Mind Works

I'm reminded in this respect, the example I think is the most instructive, is Plato's *Meno* dialogue. It is the story, where Socrates is arguing with Meno, who is a bit of an oligarch, about what is the nature of man. And Socrates is arguing that the nature of man is essentially creative, to discover new things, even from within himself. He says this new discovery is an intrinsic character of the human mind, to generate something from within itself, which is totally new and changes itself.

And he uses the example of trying to teach the slave boy how to double the square. He says, I'm going to show that the slave boy will be able to discover how to double the square, without telling him how to do it, but by simply asking him questions. And you know the story, that the slave boy, just by being asked questions, doubles the square, and not only amazes himself, but also Meno, who thought the slave boy was too stupid to ever learn what, at the time, was one of the most important principles of science.

But, what was the discovery there? The discovery was not the discovery of how to double the square. The slave boy did discover that, but the discovery was about the power of the human mind: The slave boy, in the nature of that discovery, *showed himself*, from *within himself*, that he had a power to change himself into something he hadn't been. And the act of doing that in front of Meno, changed Meno, because it proved to him that his view of man was wrong. Now, he wasn't changed by it, but that's a whole other story.

But you see in that example, and in the example of human creativity generally, that the human mind contains within it a type of anti-entropic potential. Because the new discovery is not *in* the mind, until it's discov-

ered, but the discovery is the effect of a potential, which is a potential not to continue to do what it's doing, but a potential to create something totally new. And the essential characteristic about this, as Mr. LaRouche has always emphasized, is that this does not occur simply in the individual human mind, but the individual human mind makes these discoveries only with respect to human culture, as it radiates across the generations, past, present, and future.

So that there's a type of harmonic interaction between the creative powers of an individual human mind, and society as a whole and culture as a whole—when I speak of that, all the generations. We absorb the creative discoveries, not through osmosis, but by replicating those discoveries in our own minds, and we add to the culture, the creative discoveries that we make. Because the action of the individual mind on the universe doesn't occur directly from the individual mind, but only through this development of culture. So, human culture, as it evolves to higher and higher states of knowledge of man and knowledge of the universe, represents the concept of an anti-entropic potential field.

I think the greatest advance in this direction, in science to date, really, has come from Lyn's work and breakthroughs in the science of physical economy, which truly lay the foundation and develop the concepts of what I'm calling today an anti-entropic potential field. But the roots of it, I think, you can find in the work of Nicholas of Cusa, in especially two works that he wrote, on this question of potential: One was the work called *De Possest*, a word he made up, from the Latin word *posse*, which means possibility, and *est*, to exist. And a later work, he called *On the Summit of Vision*, in which he refers to "the idea of the potential itself." And Cusa says that it's the potential which is where ontological existence, where reality lies, not in the thing.

He gives an example of life: Living things exist, so life exists, but life itself does not account for its own existence. What accounts for the existence of life is that the possibility for life exists in the universe. These forms of potential, the potential for life, he calls "potentials with additions." And then, Cusa says: But what's the most important thing to understand, what's the summit of vision, is what he calls the potential itself, which is the potential which makes potential possible. Why do we live in a universe in which it's possible to make things possible? And when you think of the power

of the human mind, you see that's exactly what the human mind does.

## An Anti-Entropic Potential Field

So, from this standpoint, if we start with the nature of the human mind, we can begin to construct an actual, communicable concept of the idea of an anti-entropic potential field. But, as LaRouche has emphasized, the problem we have, is how do you express such an idea? Because all our language, no matter how skillful we are, is rooted in sense perception. The language you have, that is, all the words you use and all the concepts, are tied to some type of object or action which you know through sense perception.

Now, we recognize that, in certain abstract concepts, such as justice, or truth, or love, we have to rely, not on direct language, but on metaphor, to be able to communicate such ideas, and we, of course, recognize that we're indebted to the poets and the artists for being able to develop the forms of expression by which we can communicate concepts which lie completely outside the domain of sense perception.

But this is true, also, in the domain of science, where

you think you're looking at and dealing with things that are concrete, things which exist in the domain of sense perception, or appear to be, such as supernovae, or living things. And this is something, also, that LaRouche has been quite provocative about, which I think everybody appreciates how provocative, but also how truthful it is, going all the way back to the 1970s, when LaRouche wrote a paper titled "[Poetry](#) Must Begin To Supersede Mathematics in Physics" (*Fusion*, October 1978).

So, in order to express this concept of an anti-entropic potential field, we have to actually use the principle of metaphor that we see from the great scientists.

The concept we have to express here, is a concept of a potential field, which has the potential to create a state which doesn't exist, and which is a higher state of organization of existence, and which is a necessary state of organization existence. Which means that there must be an intrinsic power in this anti-entropic potential field, the same power which we associate with the passion that's required to make the decision today, that the human race is not going to be extinct. We can all sit in this room, and agree, that we would prefer going to Mars and developing mankind, than to become extinct in the next three weeks, but without the passion to make that happen, the most probable will happen, and not the necessarily improbable.

So, our notion of an anti-entropic potential field has to have a characteristic of passion, and our science must be able to deal with this question of passion, and power. And because this is a necessary transformation: The anti-entropic potential field must exert a pressure, a pressure towards higher states of organization of existence. We see this in the question of evolution, as well.

And there's a tension also associated, which is the resistance that the anti-entropic potential field exerts on *any* attempt to produce and to increase entropy. So, rather than an increase in entropy being the characteristic of the universe, the decrease of entropy is the characteristic of the universe, and a tension arises in any attempt to impose an increase in entropy.

## A Riemannian Approach

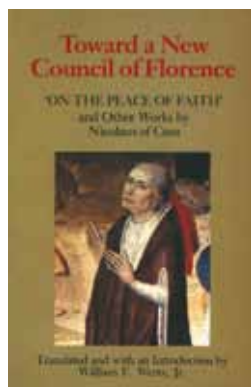
Now, this, of course, is quite a difficult program, which I outlined that we have to develop, and I don't claim to have solved the problem, but I think that by stating it in this way, we can perhaps get more of a scientific approach to solving the problem. And I'll just give a very quick indication of the kind of concepts which I think are appropriate to this.

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(Projection from the North Pole)



His seminal work on this, was a paper he wrote which is too technical to discuss here, called “On the Subject of Abelian Functions.” But in that paper, Riemann introduces an idea of connectivity, and that, as a way to express the development of a system from a lower to a higher state, the development of a potential from a lower state of potential to a higher state of potential. We can see this in the noetic domain, in the domain of human culture: That is, if you think about it, as we add to human knowledge through the development of new scientific

And you can see this exemplified in the program for the Arctic development, where we take this region of the planet, which right

So, as I said, this is just a beginning of what kind of direction science must go. We have to abandon the Second Law of Thermodynamics, and put the creative minds of the scientific community to work, to elaborate and develop this concept of an *anti*-entropic potential. And, to paraphrase Riemann's great habilitation paper, this is a subject in which we must enter the domain of politics, and the current occasion emphatically demands that we do so.