
IV. The Curvature of Human Progress

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1997 Is Not 1929: A Lesson from Carl Gauss

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The following is the edited transcript of Lyndon LaRouche's keynote speech to an EIR symposium, "Toward a New 'Bretton Woods System,'" held in Bonn-Bad Godesberg, Germany, on Nov. 5, 1997. It first was published in the EIR of November 21, 1997.

We are in a phase-change, right now, in world politics. With the partnership which was established between the President of the United States and the President of China, a turning-point has been reached in planetary political relations. This agreement, this partnership, signifies a long process, since 1989, of a shrinking of importance of the Atlantic relationship, and a relative increase of the polarity of the Pacific relationship.

This has been due to two processes: One was the collapse of the Soviet system, beginning in 1989. The importance of the European economies became less, particularly after George Bush, then President of the United States, supported the policies of Mrs. Margaret Thatcher of England and François Mitterrand of France, to destroy eastern Europe, and to prevent Germany from rising in the wake of the collapse of the Soviet system, to become a stronger power in Europe. The result of the self-destruction of the European economies since then, plus the destruction of eastern Europe and the former Soviet Union itself, means, that the economic center of gravity on the planet is no longer Atlantic, but it is presently Pacific.

The agreements between the two Presidents—

whose importance, I think, is even underplayed greatly in the European press, the depth and profundity of the practical understanding between the two heads of state—that this will become a strategic bloc, a partnership, not a fixed kind of partnership, but a partnership-process, which will engage Japan, which will engage Russia, which is already engaging Southeast Asia, which will hopefully engage South Asia, centered around India, Bangladesh, Pakistan, as well as Iran. That process is in place.

What I should say today, in the nature of addressing the subject, will include: Under these circumstances, what is the role of Europe, and especially western Europe, in these circumstances? What crucial strategic role and what crucial strategic interest does western Europe, especially western continental Europe, have, in these circumstances?

In addressing this problem, it is important, as we assemble in Germany today, to emphasize four leading thinkers of Germany, whose words bear directly upon the problems and solutions we have to consider here. The first is Johannes Kepler; his follower Gottfried Leibniz; his follower Carl Gauss (it is a very specific work, that he did as a follower of Kepler); and the work of a follower of Gauss and Leibniz, Bernhard Riemann. These four figures of German thought are crucial for understanding both the nature of the problem which faces us, and the possibility of a solution.

What I shall do this morning, in keynoting this particular morning session, is to define the nature of the

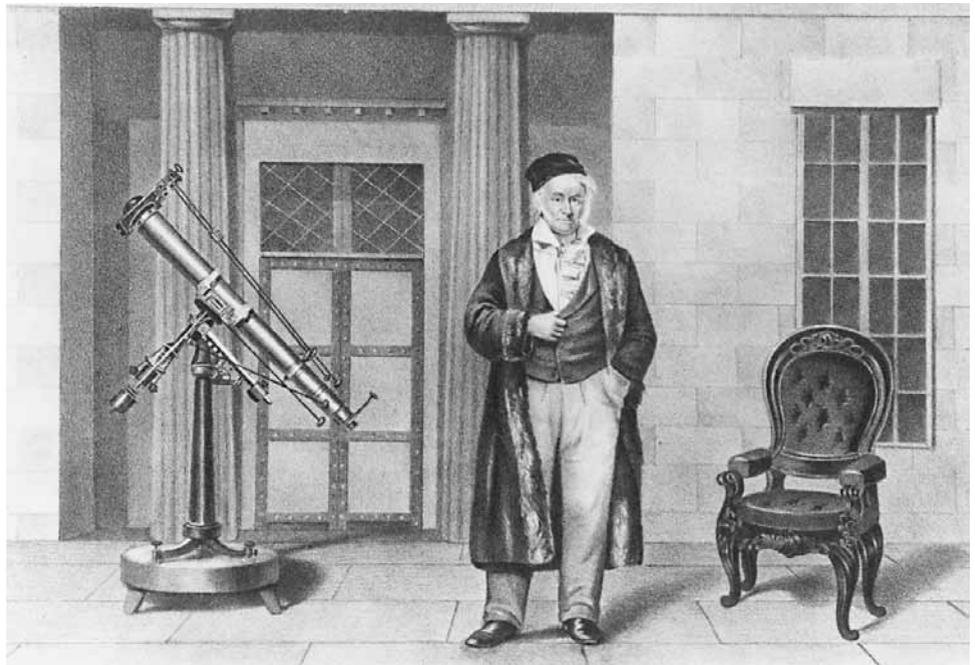
problem and the direction of the solution. Helga Zepp-LaRouche, who will be keynoting the afternoon session, will be addressing the practical approach of the problem from the standpoint of Europe as such.

In the recent period, particularly in the past weeks, we can say that the number of persons who doubted that we were in a systemic crisis, has greatly diminished. Virtually all intelligent, influential statesmen, economists, and so forth, agree, at this point, that we are in a systemic crisis. They may not want to use the words, but they will describe it as such. The references are made commonly, as I have been doing this past month, to the October 1987 stock market collapse in New York City.

In the past week, more and more references were made, misguided references, nevertheless, to the 1929-1931 process leading into the 1930s' depression. It is useful, of course, that people will recognize the severeness of the crisis; but, it is a great error to assume, that we can learn something from the 1929-1931 experience which will be of any use to us today in defining a solution. As I shall indicate, there are no similarities of substance between the present crisis and that of 1929-1931. Today, it is qualitatively different and much worse; and, with the help of Kepler, Leibniz, Gauss, and Riemann, we can demonstrate the difference.

Go back to 1801 in Germany, when an Italian-Swiss astronomer had recently discovered the presence of a new heavenly body, which we refer to today as the asteroid Ceres. A great number of observations were made, and a number of people used statistical methods of the time, to attempt to construct the orbit of this newly discovered heavenly body.

Most were erroneous; only one young mathematician of the time correctly determined the orbit of Ceres to be that, in harmonic values, defined for a missing



Carl Gauss (1777-1855) successfully determined the orbit of the asteroid Ceres, by looking at the curvature of action in the very small. Using this method, LaRouche proves that the current collapse of the world financial system is no "cyclical crisis," but is comparable to a comet which is heading directly for the Sun.

planet between the orbits of Mars and Jupiter, which Kepler had provided years before. Kepler had specified the existence of a missing planet between Mars and Jupiter, and gave the harmonic overall values for that planet. Gauss was able to show that the newly discovered body was a fragment, in effect, of this missing planet, and had the same harmonic orbital characteristics, that Kepler had specified for the missing planet.

Most of the people who investigated this and attempted to construct the orbit, tried to measure it by statistical methods: methods superior, then, to most of statistical methods used today in economic studies. They were wrong. Gauss selected, out of all the studies, three intervals, orbital intervals, which he used to determine the orbit of this, or the trajectory of the particular heavenly body. And, he was right.

He used a principle which we can call self-similarity. That is, the body had certain characteristics in the small, the orbit had characteristics in the small, which could be used to determine the characteristics of the trajectory in the large. That method, which is central to the work of Gauss, was actually a continuation of the work of Kepler, and of Kepler's definition of astrophysics earlier: and, by way of Kepler, after Kepler, also Gott-

fried Leibniz. So, these things become crucial to understand that today.

Now, I should demonstrate that not only is this not like the 1929-1931 period of crisis, but, rather, much worse, of a much more serious and more profound nature; but, that the policies which might be adduced from studies made of the so-called Great Depression and the 1929-1931 crisis—these policies, studies, are virtually worthless, and worse than worthless, for defining policies today. There is a fundamental difference, and it would be fatal, if we did that.

We have people debating the question: “Let’s go back and study the 1929-1931 crisis; let’s look at the policy considerations then; let’s apply the policies we should have applied, then, to the situation now, and that will be the answer.” That would be the most fatal error one could make.

There is no way to fix this system, in the way the former crisis could have been fixed. We have a completely different kind of problem, which was called by some economists, back in the 1920s and 1930s, and earlier—was called “a general breakdown crisis” of the entire global system.

The causes of this problem we have today are not economic. The crisis on the surface is an economic crisis, it manifests itself in economic effects, but the causes are not economic; they are political and ideological. The beginning of this crisis is the years 1964-1972, in which, after the missile crisis and the assassination of President Kennedy, a number of powers decided that the process of détente had been secured with the Soviet system, as the result of negotiations coming out of the missile crisis. At that point they said: We are no longer in danger of general warfare, of what was called an annihilation warfare in German strategic studies, formerly. But, we would now have only limited wars, wars which would manage the diplomatic edges. We would have limited wars, which would be conducted to adjust diplomacy, and would be managed as a



A homeless woman in Frankfurt, Germany. The self-destruction of the European economies since 1989, means that “the economic center of gravity on the planet is no longer Atlantic, but it is presently Pacific.”

matter of diplomacy. This was called the new phase of balance of power.

Under these conditions, the emphasis, which is always laid in modern warfare, upon developing an adequate logistical basis and technological military basis for conduct of general warfare, this was thrown out the window. And, with it, there was a process of taking down the machine-tool design and other economic and scientific sectors, which would be essential for modern warfare.

A Large-Scale Cultural Paradigm Shift

At the same time, there was introduced, beginning 1964, a large-scale cultural paradigm shift, which targeted, principally, people entering universities during the middle to late 1960s. The degeneration of society, the degeneration of economy, over the past 30 years, is a result of the effects, not only in Europe and in the United States, but in other parts of the world, of the so-called “march through the institutions” of the new generation of radicals, out of the universities of the second half of the 1960s.

These policies were not only the rock-drug-sex youth counterculture, which echoed the youth counterculture in Germany, for example, of the 1920s. This was a synthetic counterculture, which utilized a principle of shock.

This was, for example, studied by the London Ta-

vistock Clinic, and Tavistock Institute: that if you take people, as this was studied in the First World War—if you take soldiers and you put them under great stress, you produce an effect, among many, which was called, in the First World War period, “shell shock,” from the effect of extended service on the French-German front in France, in which soldiers would go again and again into combat, charging against the machine guns and the barbed wire, and the artillery; and, they would be broken men; and they would be taken back and treated as mental cases.

Now, the people who studied the so-called “shell-shock” effects, including the Brigadier General Rees who set up the London Tavistock Clinic, determined, that people in this condition were highly suggestible and labile, easily managed, easily controlled.

What happened to the youth population during the 1960s, raised under conditions of the threat of general nuclear war during the late 1940s and 1950s, being subjected to the global shock of the missile crisis of the October-November period 1962, and then the shock, in the United States, of the Kennedy assassination in 1963: these young people lost their equilibrium. They became highly suggestible, highly labile.

I was teaching on campuses, a number of them, at that time, during the period of 1966-1973, and I observed the extreme lability, the extreme suggestibility, the rapidity with which they would go through evolutions, the general movement from one evolution to a more degenerate one. So, on the one hand, we had the rock-drug-sex counterculture, the youth counterculture, which was concentrated initially in the university populations, under the influence of the so-called Frankfurter Schule and the Tavistock Clinic, and people like that. The same thing pretty much in Europe, and in the United States, and in the Americas. And, also, in the East bloc, in eastern Europe and the Soviet Union, similar processes of demoralization occurred: very important in the process leading up to the collapse of the Soviet system.

This population was not only involved in this existentialist flight from reality, in the sense of Heidegger’s theory of existentialism: the individual thrown into an alien society, not part of a society, but thrown into a jungle, in which you took care of yourself, or maybe a few of your friends, but you were living like a beast in a jungle.

Along with this came the idea that technology is

bad; technology—at that time, that generation of the 1960s, associated technology with warfare. We had the rise, immediately under the influence of a cult of information theory, which had just begun to be spread heavily as a mass propaganda movement at that time— We had the idea of a “post-industrial society.”

Now, as these people became more and more influential, the so-called baby-boomer generation’s march through the institutions, as these ideas spread into broader sections of the population, outside the university graduates, as they spread into the entertainment industry in particular, with the mass media, we had a change to a post-industrial ideology, such that in the United States, for example, if we look at economy in physical terms, and measure productivity in the physical content of market baskets of consumption, by infrastructure, by industry, by agriculture, by essential things such as medical care, education, and so forth: that, the actual income in the United States, per capita of labor force today, is half of what it was 30 years ago.

Similar things are happening in Europe. People say we must have lower wages, you must find cheaper labor in other parts of the world. You don’t invest as much in infrastructure, you cut budgets; and, you cut away the essential economic stimulus of economic development, and even the maintenance of the present level of society. What happens, then, in economics, with the corrosive effect of this ideology, as people who were brainwashed in the universities in the 1960s graduated, advanced to higher and higher positions, occupying the top positions in banking, more and more positions in government, positions in business, in the professions? As the percentage of people who actually produced declined, and were replaced by services industries, by entertainment, by useless activities which are really of no benefit to society, just to keep them employed and give them a minimum wage, to keep them alive and keep them in the system: the economies decayed.

The Breakdown of the Bretton Woods System

And, this 1970-1971 period is crucial; 1971, the collapse of the Bretton Woods agreements, by choice, essentially. It started with the British, under the Wilson administration, back in the early to middle 1960s. The British sterling collapse of the fall of 1967, the crisis of the U.S. dollar, which broke out after the sterling collapse, beginning in January 1968, to the first break-

down of the Bretton Woods system in March 1968. In 1970-1971, the collapse of the Bretton-Woods agreements; 1972, the first step to a floating exchange-rate monetary system, after which point, virtually all Third World net development collapsed, because of the impact of this.

This was aggravated by London's rigged oil-price shock of the middle 1970s. The oil-price shock and the evolution of the so-called petro-dollar bonds and the floating-exchange-rate system, and then finally, the agreements of Rambouillet and the new rules for the floating-exchange-rate system, doomed the Third World, essentially. Yes, there is growth, there is investment, but in net effect, in terms of the total population of South America, Central America, not to speak of Africa, but also a good deal of Asia, has been doomed. The condition of India, for example, today, is much worse than it was in 1982.

Mexico has not had any net growth at all since 1982. The conditions have become worse, at an accelerating rate. And, this is generally true in most parts of the planet. As a result of these social policies, in the name of ecology, in the name of zero growth, in the name of information theory, and all these things that came in, we have systematically destroyed the economy. The idea of investing in infrastructure, in advanced education, in science and technology, as a way of providing increase in man's power over nature as a way of macroeconomic profit of our economies: that idea has long gone. The dominating idea, is to find other ways of making profit, outside of investments in scientific and technological progress and basic economic infrastructure.

As a result of that, the per-capita physical values of production have collapsed around the world, since the 1960s. Something else has happened: The floating-exchange-rate system opened the doors to unregulated speculation against currencies and economies. The first phase of this major speculation was the oil-price shock, orchestrated by the London petroleum marketing cartel, in 1974-1975.

The second shock was the collapse of the U.S. economy, willfully, by Paul Volcker, in October 1979. Volcker's methods had been studied during 1975-1976, at which time they had been called "controlled disintegration of the economy." Volcker, in October 1979, after being selected and nominated as Federal Reserve chairman, introduced the policies, which he personally also

referred to, accurately, as controlled disintegration of the economy. The radiation of the Volcker policies outside the U.S., into the rest of the world, produced that kind of effect: controlled disintegration of the world economy at an accelerated rate.

As a result of the Volcker measures, in 1982 we had the growth in the U.S. of junk bonds. Junk bonds are, essentially, looting body parts from the dead. It was done simply by moving in on institutions, which had been implicitly bankrupt, as a result of the measures of the 1970s, including the Volcker measures, and then coming in to find new ways of refinancing and looting these organizations—such as the savings-and-loan banks.

The junk-bond phase came to an end with the 1987 stock-market collapse. It continued for one more big gasp into 1988, and then collapsed. In 1987-1988, there was the unleashing of derivatives. Now, today, we have the combined on-balance-sheet and off-balance-sheet volume of derivatives, which are current obligations, of \$100 trillion, plus or minus. Of course, in addition to that, there are also highly inflated, i.e., exaggerated values of real estate mortgages, and things of that sort, as we see in the Japan case, which add up to several tens of trillions of dollars, globally. On that account, the current and near-current obligations, on financial account of the world, are several times the growth of domestic product combined of all nations of the world. Thus, implicitly, on this account alone, the world is bankrupt.

How has the mechanism functioned? It has functioned, because we discounted used-up assets of the past. We paid labor less than it cost to reproduce that quality labor. We discounted and looted these things in order to generate monetary aggregates which we put into the financial markets, which we were not investing in production, in infrastructure, in technology, but simply investing in speculation. That is, the profits of speculative gain became the profits for which people invested. So, we had a financial parasite sucking at the economy. Not only were we propping up speculation by monetary aggregates which were pumped into pure financial speculation; but, the rate of speculation increased.

For example, in the U.S., from 1956 to 1972, foreign trade, imports and exports, accounted for about 70%, consistently, every year, of total U.S. foreign exchange turnover. By the inauguration of Reagan, at the



The counterculture turns out for an anti-nuclear demonstration in Wiesbaden, Germany, in April 1996, on the the 10th anniversary of the accident at Chernobyl. Slogans read “Nuclear Power? No Thanks” (left) and “Chernobyl was also a sure thing—sure as death” (right).

beginning of the 1980s, this had fallen to 5%. Foreign trade now accounted for only 5% of the total annual foreign exchange turnover. By 1992, it had fallen to 2%. It is, today, substantially below 0.5%.

So, you have a disengagement, a decoupling of finance from reality. We reached a point of no return, a point at which the relationship among total financial aggregates to monetary aggregates goes implicitly hyperbolic; at which the relationship between increasing monetary output and decreasing net physical output per capita, also is hyperbolic. Therefore, the system goes into something that is analogous, in physics, to a trans-sonic velocity, in which anything done to put monetary aggregates into the system, to perpetuate it, makes it worse. You reverse, you go into negative curvature. So, the attempt at this point, to continue pouring in monetary aggregates, to stave off financial crises, is like pouring cold gasoline on the fire, as a way of trying to put it out. You may slow down the rate of burning for a moment, but you are building up the explosion for the next moment. We have now come to the end of the system.

This Crisis Is Not Cyclical

What is the characteristic of this process? The 1929-1931 crisis was a cyclical crisis. That is, a kind of crisis in a system, which can occur periodically, without threatening to actually destroy the system. This kind of crisis, sometimes called a “business cycle,” was characteristic of modern European economy, for a simple reason: Modern European economy was not homogeneous; it had two contrary elements in it, cohabiting.

One: You had what Friedrich List referred to as “national economy,” the real economy: infrastructure; the nation-state as protector of national development; investment in scientific and technological progress; development of basic economic infrastructure; improvement of education; improvement of health care; improvement and fostering of scientific services. That was the national economy.

Then, there was another element: the financier oligarchy, one of the relics of feudalism. Feudalism had two basic, dominant classes. One was the landed aristocracy, which was gradually eliminated, up to about

1848, when the power of landed aristocracy was broken by Lord Palmerston's deployment of the Benthamites throughout Europe, to bring down the remains of Metternich.

But, the financial oligarchy, typified by Venice, under feudalism—that continued. It established a new base, centered in London, and in the Netherlands, and continued. So, the European economies became mixed economies, with a financier oligarchy on top, dominating the finances of the economy, but underneath a national economy.

What happened was, that you would have, periodically, this accumulation of these excess financial assets in the financier section of the economy. You would purge the economy of this, by having a little depression, burning up some of that useless paper, bankrupting it. Then, usually patriotic upsurges in the nations would say: Go back to national economy! And, governments would then turn back to national economy. Or, the threat of a war would force national governments to go back into national economy policies, for strategic reasons.

So, we had—during the nineteenth and into the twentieth century, we had these business cycles, which are the pulsations of interaction between two opposing social forces: the social forces of national economy, and the social forces of finance economy.

That kind of system is like a planetary orbit. It goes through winter and summer, spring and fall; but, it keeps on going, with some qualification. It is not *determined* by the laws of the universe, but it is subject of the laws of the universe: that is quite a difference. This gives us a planetary orbit.

And, so, people talked about business cycles; and, people today are trying to talk about business cycles! This is not a business cycle. It is something else.

What happened, over the past 30-odd years, is, we have destroyed, systematically, the foundations of national economy. People say, "We can do it, because there is no longer a danger of war." We did it under *détente*, from 1964-1989. We took down our economy, saying: "We don't need that kind of economy any more, because the danger of war does not require it. Therefore, there is not a strategic imperative for maintaining national economy."

When the Soviet system began to disintegrate in 1989, under the influence of Thatcher, and a Bush who was almost a little dog on Thatcher's leash, and François Mitterrand, the other dog on the leash, these ad-

opted a policy, celebrated by the Desert Storm war, which broke the back of Europe, politically, as it was intended to do. It had nothing to do with Iraq; it had to do with breaking the back of Europe; and, breaking the back of the Soviet system. The Soviet system, or what is left of it today, has been cannibalized. Pure cannibalism!

There is no possibility of a recovery of the system in its present form. It cannot recover. The conditions in every state in eastern Europe, in terms of per-capita economic values, are vastly worse than they were under communism! We are on the verge of a social and political explosion, coming out of Russia and adjoining states, and igniting the conditions in eastern Europe—unless we do something about it.

What we are faced with now, is a crisis, not a cyclical crisis within a system, such that you could go back to the precedence of the system and use certain rules to bring the cycle back into focus again. We are now at the end of the system, at which we no longer have national economies, or only the tattered remains of it.

What has happened with the German steel industry? This is an example of that. Simple monopolization is a symptom of the last phase. The next thing is: There is no German steel industry. And, this is in sight, if things continue.

We are dealing, not with a planetary orbit; we are dealing with a comet which is headed directly for the Sun.

A Principle of Curvature

I used curvature, not as an analogy, not as a hyperbole. There actually is a principle of curvature involved here.

In the words of Schiller, most educated people, are not really educated, they are *Brotgelehrte*. They are *learned*; they don't *know*. They didn't study to find the truth; they studied to secure a position, a career. They studied to pass the examination; not to know the truth. Truth is not popular. These days, one hears of "relative truth." Everyone has their own truth. No longer does one say: "This is the universe with laws, which is occupied by human beings, who have minds; and, these minds also have laws. And, that by the interrelationship between the human mind and the universe, there are certain things which are truth, or not truth. The long history is the struggle for truth."

But, since Plato and his Socrates have been abandoned, everybody now has "relative truth;" opinion de-

termines truth: popular opinion. “What is the truth?”

“Go out and take a popular opinion poll.”

Since we have abandoned truth, we forget some things, especially in economics.

What is a “macroeconomic profit”? What should it mean?

Someone would say: “Go ask your accountant!” Or, “Ask some economist!” These are the worst people to ask. The accountants accept the figures given to them, which don’t represent the truth in any case. They represent the truth in the books, not in nature, and, therefore, don’t tell you much. The economist is a person that lied so well, that they took him off being an accountant and made him an economist.

What is “real profit”? It presumes that in man’s relationship with nature, that, in coming to an area which is poor, we improve the area; we introduce new technology, new skills; and, suddenly, the per-capita and per-square-kilometer productivity of that land area improves.

We say, “There is a gain.” That gain is the only possible source of profit, if you want to take true profit, of the economy as a whole.

How do we get this gain? Where does it come from? Leibniz was the first to examine this question, and dealt with this in references to *Analysis Situs* (that is one term he used), and to *monads*.

Where does the gain come from? Is there any monkey who can do this? Any lower species? Only man can do it.

How does man do it? We call it scientific and technological progress, or Classical artistic progress—which are both related things. The mind of man, faced with crises, faced with problems, which are sometimes called ontological paradoxes in their formal aspect: Man’s mind discovers principles, which are principles of nature, or principles of the way the mind works (which we call art, or statecraft). These principles are then applied to change human behavior in respect to nature.

As a result of the application of validated principles, man’s power over nature increases. The land is improved; the productivity per square kilometer is improved; the productivity per capita of labor force is improved; the life expectancy of people is increased; the quality of life in the family, in terms of mental and cultural development, is improved. This is true profit; this is what we should invest in, to produce.

This is what Leibniz refers to as the *monad*, the ability of the cognitive processes of mind to generate discoveries of principle; and, this articulation by Leibniz became the basis, later, for Riemann’s fundamental contribution to modern physics.

How Discoveries Are Made

What is a discovery? Let’s take the case of physical science. Let’s presume, that our physical science is based on the experimental authority of physical experiments, or observations, which have the same function as physical experiments, as in astrophysics. Now, we come along, and we find that something has occurred in nature, for which the supporting evidence is as valid in nature as the supporting evidence for our existing physics. But, our existing physics says, that this thing that we just observed, couldn’t happen. Now we have, therefore, two things presented to us: an old physics, validated on an experimental basis; and, new evidence, also validated on an experimental basis, which defies the old physics. We have, therefore, what is called an *ontological paradox*.

Now, put yourself into the mind of a student in a good classroom, as in the *Humboldtsche* program, in which the student is given this problem at the appropriate point in the student’s education; and, the student is asked to reinvent the discovery made by someone, without telling the student exactly what the discovery is. So, the student has to relive the mental act of discovery.

The student, then will have a principle; he thinks he has discovered the solution. He reports the solution to the class. They will discuss it, and they will, probably, also discuss the way in which you can validate, or invalidate, that conclusion, by means of an experiment. A good instructor will outline the experiment which is done to prove or disprove that assumed principle, and, probably, will have the equipment prepared for the classroom, for that point.

Now, the student has relived the act of original discovery, of a person perhaps centuries, or millennia earlier, as in the case of some of the Greek Classical studies.

Go through the steps of that. How do we represent each of those steps?

Step one: Can we represent the conflict between two bodies of evidence? One for the old physics, one for the new phenomenon, that contradicts it? Yes.

Can we represent the second stage, the mind of the

student actually generating a solution? No. Not by sense-perception. We only generate that by imitating that, by doing the same thing ourselves.

Third: Can we report, in a form which can be represented, the discovery of principle we have made? Yes.

Can we describe the experiment to be done; and, can we observe the result of the experiment which validates the discovery? Yes.

But, the second step is missing, in the normal course of events: the most important of all steps, the thing that makes the difference between man and a monkey. Something which some monkeys have not yet discovered: the role of the creative powers of the sovereign individual mind, the ability of the human mind to discover, and to replicate the discovery of a principle of nature, or a principle of art: to generate what Plato calls an *idea*. The *idea* belongs to the second phase: the concept of the solution in the form it is generated from the problem: *ideas, which can only be understood, and communicated, by replicating them*. That is: You can repeat the experiment. You can repeat the problem.

How do we train people? We train people in *ideas*: to relive the experience of discoveries of people before them. Because, human history is all *ideas*. Man's power over nature: *ideas*. We want children not to learn how to do things, but how to use this thing that sets man apart from and above the beasts: the power to generate valid *ideas*, and, to prove them, and, to utilize those *ideas* to transform man's relationship to nature.

That's how we get progress. We generate ideas, we apply those discoveries, once we have validated them, to human behavior.

We do this also with machine-tools. How does the machine-tool system work?—something people see less and less of these days. You make a scientific discovery. You go to test it. What do you do? You go down to someone who has machine-tool capability. You build an experimental device, or observational equipment. You keep refining this experimental test, until you get it right. You either prove or disprove what you want, and you get the measurement that you need. Now, the fellow who has designed this equipment for you, or worked with you in perfecting his design, now turns it into a machine-tool principle.

This discovery can now be incorporated in the design of product, and in changing and improving the quality of productive processes. This is, essentially, the

simple way in which man increases his power over nature; and, this is where profit comes from.

It is the gain resulting from the improvement in nature through the development of nature, and the improvement in man's behavior, his economic behavior, by increasing his knowledge, that is, increasing the *ideas* made by sharing, replicating, old scientific discoveries, or, new ones.

What do we do in art? Classical art? Why is Classical art important, as opposed to the stuff that people like these days? Because Classical art is based on the same principles as scientific discovery; but Classical art studies the human mind as such, the individual mind, the relations among minds, in society.

Classical art is the basis for statecraft: to study the mind of people. What is statecraft supposed to do? It provides the circumstances under which the people can achieve their common goals. It is supposed to make sure education exists, to make sure infrastructure is developed, to make sure medical care is provided; to ensure that society is self-organized in such a way as to meet the needs of the individual, and the society as a whole; to satisfy the aspirations of previous generations; to maintain the present generation; and, to lay the foundations for a betterment of future generations. And, that is what art is conceived to do: to train the mind, to train and educate the passions in such a way, as to produce a better, more moral individual.

Where do you find that thing in mathematics? Where do you find this quality of the mind which is able to make scientific discoveries, to replicate them, to change human behavior, to create artistic works. To perform Classical music, for example: which can not be done by playing the notes. As Furtwängler said, you must re-create the idea of the process of composition, experienced by the composer, and then you must perform that, according to the notes he specified.

It is from this power, that man is able to increase man's power over nature; and, it is from the expression of this power, and only from there, that a true macro-economic profit is generated.

What is this?

This is like the problem that was faced by Gauss, in dealing with the question of determining the orbit of Ceres, as the problem that Kepler already understood, a problem which Leibniz understood, a problem which Riemann addressed: The curvature of action in the very small, in the almost dimensionless magnitude of the



The Schiller Institute performs Bach at the St. Johannes Kirche in Dalsheim, Germany, March 1997. “Classical art is based on the same principles as scientific discovery; but Classical art studies the human mind as such, the individual mind, the relations among minds, in society. Classical art is the basis for statecraft: to study the mind of people.”

cognitive powers of the mind, shapes the entirety of the trajectory of society as a whole. There it is: this not-entropic characteristic of this quality of creative potential in the mind, which generates macroeconomic profit; in the real sense, the physical profit.

The Basis of Statecraft

It is this, that improves the quality of man; it is this, that is essential to relations among states. We don’t deal with people as animals. The Chinese are not a fixed magnitude; the Iranians are not a fixed magnitude; the Africans are not a fixed magnitude. They are human beings, exactly like ourselves, perhaps with a different experience.

How do we solve our relations with the rest of the world? Do we look at these people as stereotypes, or do we look at them as human beings like ourselves; and, do we apply the methods of art and creativity, to establish the kind of relations among states which we need for our security?

Or, do we try to find out who our enemy is, like gossiping about this nation or that nation, or this stereotype or that stereotype?

Do we love mankind? It is supposedly a Christian

principle. Do we love mankind: because mankind, every person, has this potential? Do we seek to develop that potential in every person? That is the question.

Now, look here at Germany, in particular, from that standpoint, at what has happened in Germany, which threatens the very existence of the German nation—apart from Maastricht.

The machine-tool industry is being destroyed. The relationship of science through economy, through the machine-tool sector, is being destroyed.

Look at Asia. Look at the population of most of this planet, which is located in East and South Asia, across the vast undeveloped areas of Central Asia. What do they lack?

They have people. The people have minds. They can be developed. There are resources which can be developed. What do they lack?

Look at the density of the machine-tool design, the machine-tool sector per capita of labor force, throughout East and South Asia. When you go out of Japan and Taiwan (you find a few capabilities in Korea), what have you got? You’ve got almost nothing. There is no machine-tool capability in this sector of the world, relative to population.

What is Europe's traditional power? Europe's traditional power is located in this machine-tool sector, which is an expression of science, an expression of a long process of development.

What is Europe's export product? It is an essential one: it is machine-tool design.

And, therefore, the relationship, the solution in this crisis, is to define a new frontier of economic development. The new frontier of economic development is concentrated in East and South Asia. India will soon exceed China in population. Then, you have the next, smaller: Pakistan, Bangladesh, and so forth. You have Southeast Asia, an area of growing population, an area also of growing food shortages.

Next to Asia, we have, in Africa, the largest potential area of food growth left untapped on this planet. The largest area for growth of food: present, but undeveloped. You can feed much of Asia out of Africa, if you simply supply the development to Africa that it needs: the transportation networks and other development. Then, South America, and so forth.

This is our future. The export of technology, expressed in terms of machine-tool design. The machine-tool that makes machine-tools, to bring to these parts of Asia, which cannot develop without that kind of potential, that kind of catalyst. That becomes, potentially, the strategic destiny and widening self-interest of Europe.

Look At What We Are Doing to Ourselves!

But, above all, we must recognize one thing, which is what I think is the root of all our devilish problems that we face today.

We forget the real meaning of **Genesis** 1:26-30, as understood by the apostles Peter, and, especially, John and Paul: of men and women made in the image of God, to exert dominion on this planet: to recognize that all humanity is defined by this capability, the capability which I identified with the "spark of reason," with which mankind, unlike any animal, is capable of making discoveries and of replicating past discoveries, and capable of transforming those discoveries, in the nature of science and art, into increases in power per capita in the universe, and through art, in terms of improvements in statecraft and relations of man to man in this universe.

If you look at our curriculum, as taught in the universities today—look at the sociology department, look at the psychology department, where do you find

man so represented? Man does not exist in these departments. If you look in the science departments, what defines science? No, science is buried, it is a corpse.

You know, you have a difference in art between the Egyptian and Greek Archaic art, in which you have all these tripods, this tombstone design in art, called the Archaic. Then you have—In the Classic age in Greece, you have the development of art as exemplified in sculptures which were like something captured in mid-motion. The same thing in great plastic art, in terms of painting, the paintings of Leonardo or Rafael, you have art in mid-motion.

But, what we have now, is a return to the Archaic, in thought: Everything is now linear, everything is linearized in the small. You make a linear model on a computer; you are trying to make a linear model of man in sociology, on a computer. Man is nowhere there, the human being is nowhere acknowledged. It is just a number, it is something that you go to replace with the "artificial intelligence" machine. Presumably, sometimes, it does not lie.

We have lost the spark of science; we have lost the spark of humanity, in our studies of men, in our practice of art. And, this has become worse and reached a peak in the past 30-odd years, with the changes that were imposed 30 years ago, in destroying the minds of those who marched through the institutions later, destroying the conception of man, the conception of science, with the youth counterculture of that period.

We now come to the point, that we should recognize it; because, we abandoned that very principle, of the conception of man, upon which all the achievements of modern European civilization were based. We suddenly find, European civilization is crumbling around us, crumbling in mass destruction. We are not being killed by the laws of economy; we are destroying ourselves.

And, one would hope this, then:

That the very shock of what we are doing to ourselves, the fact that we are destroying nations, we are destroying our people, we are committing crimes against humanity beyond belief, simply in carrying out these policies—that perhaps the shock of that, and more than that, the shock of the fact that we ourselves are not going to continue to live like this, our nation will disappear—perhaps, finally, we will come back to our senses and say: "The problem is not what we have to get; the problem is what we are doing to ourselves."