

# Machine-tool design: the brains of profit

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The importance of Lothar Komp's accompanying report on the role of Germany's machine-tool sector, is the clarity with which it illustrates a crucial point.<sup>1</sup> The point is, that for any national economy taken as a unified whole, scientific and classical-artistic progress, combined, are the only source of sustainable profit, nothing else. The machine-tool sector illustrates the role of science in this. For the imperilled economy of the United States, and, of many other nations, today, the lesson told is a desperately urgent one, even if it appears to address only technological progress as such.

If we measure the net production and consumption of the U.S. national economy in physical terms, rather than by the misleading prices of the monetarists' virtual reality, that economy shrank by approximately half during the past twenty-five years. That shrinking is reflected in such ways, as in the fact that more than two or three jobs per family household are required today, to come within viewing distance of the higher levels of real income, and productive output, for comparable households during the late 1960s. As measured per capita of labor-force, the U.S. economy has been shrinking by more than 2% per year, for each year since the August 1971 monetary crash. In the most recent years, since the October 1987 stock-market shock, the rate of collapse has accelerated, more or less world-wide, toward levels nearer to 5% per year, and soon much, much higher.

The decline of the machine-tool sector, in Germany, and among other formerly prosperous industrialized economies, demonstrates most clearly the reasons for the past quarter-century's economic catastrophe of our planet.

The chief cause of this collapse, is that radical change in economic, monetary, financial, and trade policies, which was introduced over the 1966-1972 interval. That was a period of great change, away from a traditional agro-industrial economy, whose superiority over all pre-Fifteenth-Century forms of society, had been rooted in fostering investment in scientific and technological progress. Since the middle 1960s, the

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1. Lothar Komp, "The Crucial Role of the 'Mittelstand' in the Economy of Post-War Germany," see p. 39, in this issue.

economic policy of the U.S. has been misshapen by an increasingly fanatical, cultish devotion to piece-by-piece looting and destruction of the pillars of earlier economic growth. We have passed from the earlier, long-standing rationality of a production-oriented society, to mimic the pre-feudal "Malthusianism" of that Code of Roman Emperor Diocletian, the which ensured the collapse of the Roman Empire, first in the slavery-ridden, Latin West, and, later, in Greek-speaking Byzantium. We have passed into the infantile fantasy-world of "post-industrial" utopianism, as, also, into the charismatic delusions of a deranged, globalist ideologue's shibboleths of "free trade" and "floating exchange-rate."

*Under present continuation of those irrationalist, pro-Malthusian trends in belief and practice*, the existing form of global society would go out of existence soon. The end now in sight, will not come gradually; its death will come with that abruptness by which long-earned ugliness suddenly overtook the fictional "Dorian Grey." We have reached the fag-end of a thirty-year, hyperbolically accelerated process of moral, cultural, economic, and political decay.

Now, during the immediate short term, events will be dominated by an assortment of financial and monetary crises comparable to earthquakes. Monetary and financial crises at 3, 5, or 7 on the Richter Scale, are to be accepted as characteristic events of the present end-phase of the global system. We await the proverbial "Big One," about 10 on the Richter Scale: the implosion of the derivatives bubble which vaporizes, within about 3-5 days, the existing financial institutions of virtually every nation on the planet.

Nothing can preserve the world economy, the world's political system in its present form. As we speak, the world's present economic system is dying of an incurable disease, in the adjoining room.

It is really of no practical importance to estimate the exact day or week the system dies: it is sinking fast, and will never recover. The only important question, is whether you are prepared to accept the fact that it is doomed, rather than go down with it. Either we have the wit to leave the world's present economic "Titanic," or we shall certainly sink with it.

Today, only fantasy-ridden dreamers make plans for the Democratic or Republican Presidential nomination for the



*Computer-controlled machining centers being built in a Cincinnati Milacron plant in Ohio. "Almost nobody in the U.S.A. knows anything important about production any more. Fifty years ago, even thirty years ago, as much as sixty percent of the U.S. labor-force was involved in agricultural or industrial production, or in some functional relationship to constructing, operating, or maintaining basic economic infrastructure."*

year 2000; by the year 2000, possibly sooner, the good old U.S.A. itself, as we have known it up to now, will probably no longer exist: unless we abandon immediately every promonetarist, pro-Malthusian innovation in economic and monetary policy introduced during the past thirty years. Why worry about who will become the President of a nation which might no longer exist in its present form? Such is the short-term choice forced upon us. Swim for it, or sink: there is no available middle ground between the two options.

It is a good time to learn to swim. That is where Lothar Komp's report on the 1945-1996 German economy comes in. The present Washington economic policies do not work, and could never be made to work; they have failed catastrophically since the first year, 1966, they began to be introduced as neo-Malthusian policies of the U.S. government, thirty years ago. It is past time we should have returned to those proven, earlier policies which had served us so well, until we began to abandon them, thirty years ago. Now, we should either remember what worked, or learn it quickly.

We must tell the good news about the pre-1966 economy to that next leading generation, now under thirty-five, most of whom have come to recognize that their parents' generation has turned out to be the worst management of the economy since that Confederacy-minded Yankee, President, and virtual Nashville Agrarian Calvin Coolidge, pre-arranged the Great Depression of the 1930s. The up-coming generation of young adults may have been far more poorly educated in

public schools and colleges than their parents' "Baby Boomer" generation, but they are accurate in their contempt for today's government and political parties, when they complain that they and their children have no future in the direction the world economy is plunging today. Showing that up-coming generation what used to work, before the follies of riotous 1968, is the best hope for the future of this nation, and the world.

China's leaders of today have dumped "The Great Proletarian Cultural Revolution" of 1966-1976, with results fairly described as a brilliant success; it is past time that the U.S.A. "Baby Boomers" did the same. The key to economic survival of the U.S.A., and civilization in general, is to get back, very quickly, what Lothar Komp's facts present as typical of the time when national economies still enjoyed a general macro-economic profit: basing the economy on investment in the successful designing of ever-better machine-tools.

### **Do you use a personal confuser?**

Not overlooking the fact, that some economists command the personal competence of a seasoned clinician:<sup>2</sup> every generally accepted doctrine of economics taught in any known

2. E.g., John Kenneth Galbraith, Maurice Allais. In each of the more notable instances of such clinician's competence, the specific quality of the expressed *virtù* is of a type located outside the realm of formal mathematical argument, as in the domain which Leibniz identified as "Analysis Situs."

university in any part of the world, is axiomatically worse than useless. On this account, there is little preference between the doctrines of the British Empire's Haileybury school, and that recocking of David Quesnay and Haileybury's Ricardo, which Karl Marx dished out of the British Museum's reading room. The worst of the common classroom effluent, is the variety of "mathematical economics" derived from John von Neumann's "systems analysis" hoax. The very worst economics, is that monetarist stuff suitable for dumping from the bilge of a personal computer. For each and all of the classroom economics dogmas, that of Marx included,<sup>3</sup> the function which Kompreports for Germany's machine-tool sector, does not exist: a function upon which all successful modern economies have depended absolutely.

The present writer has identified that problem of competence in many earlier locations, including extended treatments of the problem in 1996 editions of *EIR*. In the latter locations, he has identified the problem as the axiomatically implicit, linear presumption, that "commodities are produced by commodities."<sup>4</sup> As stressed in those locations, the axiomatic error of all such classroom doctrines and textbook theory is that they premise themselves upon a quality, "profit," or "surplus value," which is the *sine qua non* of their whole system; nonetheless, paradoxically, they describe a system which could never produce a net profit for any economy which is considered in its entirety!

The paradox is expressed in the following terms.

First: in fact, the ability to produce an array of products of a defined quality at a defined rate, depends upon two leading preconditions: 1) the development of such preconditions of production as physical-productive-capital, and of the infrastructure in which production and its product's distribution is physically situated; and 2) the development of the households of the employed labor-force. These combined preconditions, express a notional equivalent to "energy of the system." This "energy of the system" is expressed in respect to per capita of labor-force, per household from which the labor-force is drawn, and per unit of the relatively improved land-area in which immediate labor-force, production, and physical distribution are situated.

Second: for there to be a profit of such an economy as a whole, the produced output must more than replace the consumed energy of the system represented by combined physical costs and expenses of production, services, and "overhead." The margin of gain may be regarded functionally

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3. In *Capital*, Marx confesses, that his system, contrary to the economics of G. Leibniz, Alexander Hamilton, et al., leaves out of account the role of technological progress. In short, all of today's generally accepted classroom doctrines, make no functional distinction between an economy (and, presumably, economics textbooks), produced by apes, and the practice of a society of human beings.

4. "The Essential Role of 'Time Reversal' in Mathematical Economics," *EIR*, Oct. 11, 1996; "While Monetarism Dies," *EIR*, Oct. 25, 1996; and, "The Descent to Bush from Man," *EIR*, Nov. 15, 1996.

as "free energy." When technological attrition is taken into account, we have the following.

For profit to be sustained, the ratio of "free energy" to the "energy of the system" must not decline, although the relative quantity of "energy of the system" per capita, per household, and per unit-area, are each and all increasing individually, and in combined effect. Thus, the economic process is characterized by "negative entropy," as that term was employed by biologists prior to publication of Norbert Wiener's "information theory" hoax.<sup>5</sup>

Worse (for the mathematical economists)! The development of modern society (e.g., European civilization since 1439-1440, until 1966), shows that such net increases of "negative entropy" are characteristic of modern European civilization as a whole, over more than five centuries. From the standpoint of animal ecology, the situation of the mathematical economists is devastating: the development of human potential relative population-density above a potential of several million individuals on a cultural level comparable to baboons, to the several hundred millions existing prior to the Fifteenth Century, shows that such "negative entropy" is the net characteristic of all human existence.<sup>6</sup>

Whence the "free energy" which is characteristic of all successful human behavior? Where is the responsible agency? What is the sufficient and necessary reason, that humanity, and humanity alone, should exhibit such characteristics? For the answer to such questions, and for a competent economics, one must, as Bernhard Riemann insists, depart the realm of mathematics, for the higher domain of experimental physics.<sup>7</sup> This brings us into the domain which Leibniz identified by the rubric "Analysis Situs."

### Analysis situs: a snapshot

Thus far, we have identified the external side of the matters which must be correlated, if one is to understand the nature of the policy-crisis which the present monetary-financial disaster represents. Now, we must look at the matter from the "inside." The underlying issue here is locked up, inextricably, with the notion of "mind over matter," the relationship of the functions of the individual human mind to mankind's ability to achieve physical mastery over the preconditions of human life. In other words, we are obliged to detour for a few minutes, to focus upon those matters which all today's generally accepted—which is to say, manifestly incompetent—economic doctrines prefer to leave unmentioned. This compels us to focus upon the practical implications of a branch of science much higher than mere mathematics, "Analysis Situs."

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5. Norbert Wiener, *Cybernetics* (New York: John Wiley & Sons, 1948).

6. See, "While Monetarism Dies," op. cit., Figure 3, p. 18.

7. B. Riemann, *Über die Hypothesen, welche der Geometrie zu Grunde liegen* (habilitation dissertation), in *Bernhard Riemann's gesammelte mathematische Werke* (New York: Dover Publications (reprint), 1953), p. 286.

The notion of “Analysis Situs” is made intelligible through no other means than the proper definition of the Greek term “hypothesis,” a term which can be competently defined for science in no other way than by Plato’s Socratic method.

To wit: If a series of plausible propositions, such as prospective theorems of a geometry, appear to suffer no mutual inconsistency, what are the hidden, underlying assumptions, shared in common by those propositions, which supply the apparent consistency? In reply to that specific question, the Socratic method of Plato’s dialogues yields a set of interactive definitions, axioms (including the axiom of deductive method), and postulates; that latter set is termed an *hypothesis*.

If, in turn, we produce a castrated parody of Aristotle, by application of nominalist William of Ockham’s “razor” by the Venetian Paolo Sarpi; and, if we add the obsession with sensuality which a eunuch might thus achieve, we have added to a barebones Euclidean geometry’s underlying hypothesis, the axiomatic presumptions which transform Euclid into a reductionist. We have, then, one of the assorted materialist, empiricist, logical-positivist derivatives of what was called “terminism” in Ockham’s time, and philosophical “nominalism” today. That Ockhamite mutilation, as typified by Venice’s Paolo Sarpi, and by Sarpi’s lackey, Galileo Galilei, produced the empiricism of Sarpi protégé Francis Bacon, of Galileo’s student, Thomas Hobbes, of Locke, Newton, Hume, and the fraudulent doctrine of analytical mathematical functions derived from the neo-Euclidean, nominalist notions of infinite series of the Euler-Lagrange tradition.<sup>8</sup>

Thus, the delusion typical of Euler, Lagrange, Cauchy, and their followers, was provided a devastating refutation by the 1854 habilitation dissertation of Carl Gauss protégé and Göttingen professor, Bernhard Riemann.<sup>9</sup> Riemann’s dissertation returned mathematics and physics to the standpoint of the principles of Analysis Situs featured within that posthumously published writing by G. Leibniz known as the *Monadology*;<sup>10</sup> Riemann accomplished this, by exposing and correcting the fundamental fallacy pervasively corrupting all formal geometry, “from Euclid through Legendre”: that the assumptions underlying the axioms of Euclid had been asserted without the required, rigorously Socratic consideration of their origins and implications.<sup>11</sup>

For example, Leonhard Euler’s fraudulent, 1761 attack upon the Analysis Situs of Leibniz’s *Monadology*,<sup>12</sup> was

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8. Note 4.

9. op cit.

10. G.W. Leibniz, *Monadology and Other Philosophical Essays*, trans. by Paul and Anne Martin Schrecker (London: Macmillan, 1965).

11. op. cit., p. 272.

12. On Leonhard Euler’s 1761 “Letters To A German Princess,” see Lyndon H. LaRouche, Jr., *The Science of Christian Economy* (Washington, D.C.: Executive Intelligence Review, 1992), pp. 407-419. See, also, Lyndon H. LaRouche, Jr., “Russia’s Relation to Universal History,” *EIR*, Nov. 29, 1996, Note 27, p. 20.

premised, throughout, by a dirty charlatan’s trick: a willful fallacy of tautology. Euler committed the fraud, of purporting to prove, that extension in space-time is perfectly continuous; this sleight-of-hand was accomplished, by means of constructions governed by a geometry whose existence presumed that conclusion axiomatically. On this argument, which first appears in Euler’s work from about 1741, from Sarpi and Galileo, through Hermite, Lindemann, Felix Klein, Bertrand Russell, Norbert Wiener, John von Neumann, and their followers and other dupes today, the entirety of the distinctive features of the system of infinite series and theory of functions of the Euler-Lagrange faction depends axiomatically, absolutely.

It is the corruption of mathematical physics by that fraudulent presumption of perfect linearity, a presumption extended even into the remotest nooks and crannies of the microphysical domain, which is the source of the characteristic moral bankruptcy and related incompetencies of generally accepted classroom mathematics today. It is the same axiomatic presumptions of nominalist method, which render morally putrid every branch of generally accepted, taught classroom political science, social science, history, theology, musical theory, English prose style, and economics, among the university classrooms and barroom gossips of today.

Riemann’s correction, first presented in his 1854 habilitation dissertation, takes us directly inside Leibniz’s notion of Analysis Situs, thus freeing all honest and clearheaded scientists from further obligation to the Euler-Lagrange cult’s infinite series of linear mantras.

Drop the unsupported excesses, of presuming that extension in space and time are either boundless, or that such extension proceeds with perfect continuity. Then, extensions in space and time are but four among an open-ended series of geometric “dimensions” of the real-world physical-space-time manifold. Any discovered, independent principle of nature, insofar as it is supplied unique experimental validation, and as that validation is accomplished by aid of measuring extension, is a dimension of physical space-time, that in the same sense and degree one might accord a meaningful notion of “dimension” to independent senses of directedness in merely mathematical space-time.

Thus, each experimentally validated discovery of a natural physical principle, has added such a new “dimension” to man’s comprehension of a physical-space-time manifold. Thus, we must abandon the notion of a merely mathematical, and thus error-ridden geometry of Euclidean space-time, for a series of physical-space-time manifolds, in which the number of “dimensions” represented is in the process of transition from a manifold of “n dimensions,” to a higher-order manifold of “n+1 dimensions.” Not only does experimental physics show the necessary existence of each added dimension; experimental investigation also measures the difference in “physical-space-time curvature” expressed by comparison of the characteristics of action among the manifolds compared.

In physical economy, for example, the increases in productivity of labor effected through incorporation of some newly validated principle of nature as technology, represent the changes in characteristics of action within the manifold represented by the relevant physical economies as a whole.

Once we employ Riemann's standpoint, for presenting the empirical evidence of scientific and technological progress in economies, we have three principal schemes. First, the fact that the validated discovery of a new principle of nature, is a relevant paradigm for a mental, metaphorical act of creative discovery within the sovereign precincts of the individual person's cognitive processes.<sup>13</sup> Second, we are supplied the means for representing technological progress in terms of the relative curvatures of a Riemannian series of physical-space-time manifolds. Third, we are able to measure the actual physical-economic progress corresponding to the Riemannian series of manifolds. In the application of Riemann's method to the present writer's own original discoveries,<sup>14</sup> the third step, of measurement, is effected by correlating manifest increases in *potential relative population-density* of physical-economies with the "thermodynamic" requirement, that the ratio of "free energy" to "energy of the system" of the economic process as a whole, must not decline, despite the required, ongoing increase of the required rations of "energy of the system," per capita of labor-force, per household, and per unit-area.

Two fundamental principles of Leibniz's Analysis Situs are derivable from this lesson in the science of physical economy. First, the principle of Analysis Situs characteristic of all physical economy as such. Second, that law of the universe which is demonstrated conclusively by the experimental evidence of physical economy in general.

First, the series of physical-space-time manifolds represented by scientific progress expressed as technological progress, is twofoldly ordered. It is ordered by successively higher degrees of mathematically transfinite cardinality, of the form associated with the series  $(n+1)/n$ , and this correlates with an increase in the power of man in the universe: per capita of

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13. This, by itself repudiates absolutely the central assertions on which the systems of empiricism, materialism, Euler, Kant, Norbert Wiener, and John v. Neumann are premised. See, Lyndon H. LaRouche, Jr., "On the Subject of Metaphor," *Fidelio*, Fall 1992. Scientific discovery, like great Classical forms of poetry, tragedy, music, and the painting of Leonardo da Vinci, Raphael Sanzio, et al., is expressed in the literal form of the media employed as an anomaly, an anomaly which can not, in any way, be resolved by resort to symbolic or other methods of deduction. The function of the anomaly (metaphor) is to evoke the generation of a non-linear solution for the anomaly within the sovereign precincts of the hearer's or viewer's wholly internal cognitive processes of mind. This principle of metaphor is the basis for all competent modes of education: the student must never "learn" the solution for an anomaly; the student must be prompted to derive the rediscovery of the solution within the sovereign precincts of his or her own, entirely private cognitive processes. Students so trained, know; others, like trick-performing dogs, have merely "learned."

14. Hence, "The LaRouche-Riemann Method."

labor-force, per family household, and per unit-area. This is expressed as the "not-entropic" requirement cited above.

In this physical-economic series of manifolds, each manifold corresponds to an underlying hypothesis, in the same sense that Euclidean geometry is underlain by its own governing hypothesis.<sup>15</sup> Thus, physical economy confronts us with an ordered series of hypotheses: a well-ordered lattice of hypotheses. This ordering has a validated physical-economic correlative. What, then, is the ordering-principle underlying such a lattice? We are back to the challenge of the devastating, ontological paradox posed by Plato in his *Parmenides* dialogue. The formal answer, in Plato's terms of reference, is "higher hypothesis": As any open-ended lattice of mutually agreeable theorems is underlain by an hypothesis, so a lattice of hypotheses is also governed by an underlying ordering principle, which we may term either "Higher Hypothesis," or "Analysis Situs."

In the case immediately at hand, successful physical economy, Analysis Situs corresponds to that not-entropic universal characteristic of action which satisfies the requirement that the potential relative population-density must increase, and that the ratio of "free energy" to "energy of the system" must not decline, despite the imperative increase of the "energy of the system" per capita of labor-force, per family household, and per unit-area.

Second, the fact that mankind's increasingly effective domination of our universe occurs in this ordering of hypotheses, demonstrates the principle, that the universe is so "pre-designed" that it submits to mankind's will, when that will conforms to the not-entropic ordering of hypotheses manifest for the general case of physical economy. The fundamental law of the universe, is thus proven to be "universal not-entropy," in this sense of that latter term.

Here, we have summarized the intrinsic superiority of the principles of Analysis Situs to any mere mathematical precept. This accounts for the fact that the clinical insight of some notable economists stands in noble opposition to any generally accepted textbook of today's university classroom. The point is better understood by comparative reference to the case of Classical musical thorough-composition. We conclude the discussion of Analysis Situs as such, with summary of the musical comparison, and thereafter resume direct attention to the implications of machine-tool design functions within successful modern economies.

## From Bach through Brahms

The rigorous *bel canto* domain of J.S. Bach's well-tempered polyphony, laid the indispensable foundations for a revolution in musical composition introduced by Wolfgang Mozart during the early 1780s. The generic name for this improved method of Classical composition, is "motivic thor-

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15. All systems, Isaac Newton's included, are governed fully and thoroughly by an underlying hypothesis. See B. Riemann, op. cit., p. 525.



*The chorus of the Collegiate of San Bartolomeo, in Busseto, Italy, directed by Rev. Tarcisio Bolzoni, performs Mozart's "Ave Verum Corpus," Nov. 30, 1996. "This seemingly little piece of Mozart's addresses faculties of the human mind far above the reach of any generally accepted form of classroom mathematics."*

ough-composition."<sup>16</sup> For convenience, we reference the notable, most-frequently quoted keyboard example of Mozart's derivation of his discovery of the new method, his K. 475 Fantasy, and its implicitly embedded Lydian mode, the example most frequently referenced in the compositions of Beethoven and Brahms, for example. Exemplary is the case of Mozart's own *Ave Verum Corpus*, as the relevant case was presented to a September 1996 conference by Mindy Pechenuk.<sup>17</sup> This latter example serves to illustrate the musical role of the same Analysis Situs we have located within the setting of physical-economic processes.

Like the opening germ of a great Classical tragedy, such as the ironical opening setting of Shakespeare's *Hamlet*, a piece of musical thorough-composition begins with the ironies inserted into the musical universe by the explicit statement of a pair of intervals. This set of intervals, together with the shadowy, unsaid inversions it evokes in the musical intellect, constitutes an ambiguous modality, as the contra-

puntally implicit Lydian mode within Mozart's reading of Bach's C-major/C-minor modality, typifies this. From the polyphonic unfolding of a selected pathway of contrapuntal development, the entire composition flourishes.

From this flows a succession of modalities out of the opening germ, ordered according to implied, often explicit increase of relative cardinality. The effect is akin to the most ruthlessly perfected Classical strophic poem, or the most ruthlessly thorough-composed Classical Greek, Shakespeare, or Schiller tragedy. A process of "unfolding musical development" ensues. This is expressed as new modalities, an ordered series of musical hypotheses, in fact.

This brings us, as in the case of Mozart's *Ave Verum Corpus*, to a closing quoted modality. In that case, this involves a two-fold irony: the addition of a second "ave," at the outset of the vocal parts, provides an explicit access from the initial "Ave," to the Bach-Mozart, Lydian-implicated principle of Mozart's K. 475 Fantasy. This is key to the contrapuntal implications of the piece's concluding modality. The idea with which that concluding modality is associated liturgically, "the test of death," coincides with perfect functionality to the musical implications which the composition supplies to the closing modality.<sup>18</sup> Mozart's true Classical musical genius, expressed at its highest level, in a most compact form.

This seemingly little piece of Mozart's, addresses facul-

16. This method is limited to the Classical composers, as typified by Mozart, the later Joseph Haydn, Beethoven, Schubert, Brahms, et al., and never the Romantics such as Liszt, Berlioz, Wagner, et al. The Romantics, as in the case of Liszt's keyboard sonata, sometimes attempt, unsuccessfully, to parody Mozart's or Beethoven's treatments of the K. 475 Fantasy, but have no actual comprehension of the method, since it is contrary to those principles of Nineteenth-Century Romanticism derived from the *Critiques* of I. Kant.

17. See, Mindy Pechenuk, "Mozart's *Ave Verum Corpus*," *Fidelio*, Winter 1996.

18. Mindy Pechenuk, op. cit.

ties of the human mind far above the reach of any generally accepted form of classroom mathematics. Indeed, all Classical forms of musical thorough-composition lie on a much higher level of the human intellect than any of today's generally taught versions of higher mathematics! In one "little" Mozart composition, we are presented with a magnificently coherent array of successive hypotheses, arranged to such effect that the last hypothesis forces the mind to elevate itself to a specific choice of Higher Hypothesis, which then serves, musically, liturgically, and philosophically, as the indivisible Idea of the musical composition taken in its entirety. Additionally, like all functions of higher hypothesis, the mathematical representation of the manner in which both the idea of the composition and its competent performance are constructed, compels us to enter the domain of functions in which apparent time-reversal rules.

This illustrates the point, that music composed and refined to conform with the Classical principle of composition so typified, reflects the highest cognitive faculties of the human mind.<sup>19</sup> It shows the indivisible nature of that cognitive power of creativity which, contrary to both the ponderously silly Immanuel Kant and to the Nineteenth and Twentieth Centuries' Romantics and modernists, commonly underlies science and Classical art: *Naturwissenschaft* and *Geisteswissenschaft*. Indeed, the music of Bach, and of the principle of Classical composition which Mozart derived from Bach's highest principled achievements, since it is composed upon a higher cognitive level of mental processes than mathematics, has shown itself to be a more or less indispensable habit in fostering relatively high rates of creative scientific achievement among scientific professionals: whereas Country-&-Western and Rock, tend to promote blockheaded formalism, or worse tendencies. More narrowly to the point: it is the comparison of the roles of Analysis Situs in the best developed strictly Classical art-forms and creative scientific productivity, which provides us a kind of "Rosetta Stone" for understanding the domain internal to the sovereign precincts of the individual person's cognitive processes.

Notably, it is Classical art-forms derived from the tradition of Homer, Aeschylus, and Plato, which supplied Augustinian Christianity with the tools by means of which to launch the Fifteenth-Century ecumenical Renaissance and its original creation, the modern form of constitutional nation-state. It is that design of the state, derived from Classical art, not physical science, on which the effective economic development of physical scientific development depends absolutely.

## Education and economy

"Out-sourcing" is the increasingly popular form of national economic suicide practiced by those silly governments and foolish firms, which abandon customary sources of tech-

nology services and component parts, in favor of importing components "just in time" from foreign places where labor is cheaper, and less skilled. From the standpoint of industrial management, "out-sourcing" rivals the post-Brandt-Reform collapse of quality of German education, as the thing which is slaughtering the technological competitiveness of the quality of as much German industrial production as survives the general industrial *démontage* of Europe and North America during the recent two decades. The case of the departed Lopez from Volkswagen is, in several respects, a complementary expression of the same disastrous trend toward "out-sourcing."

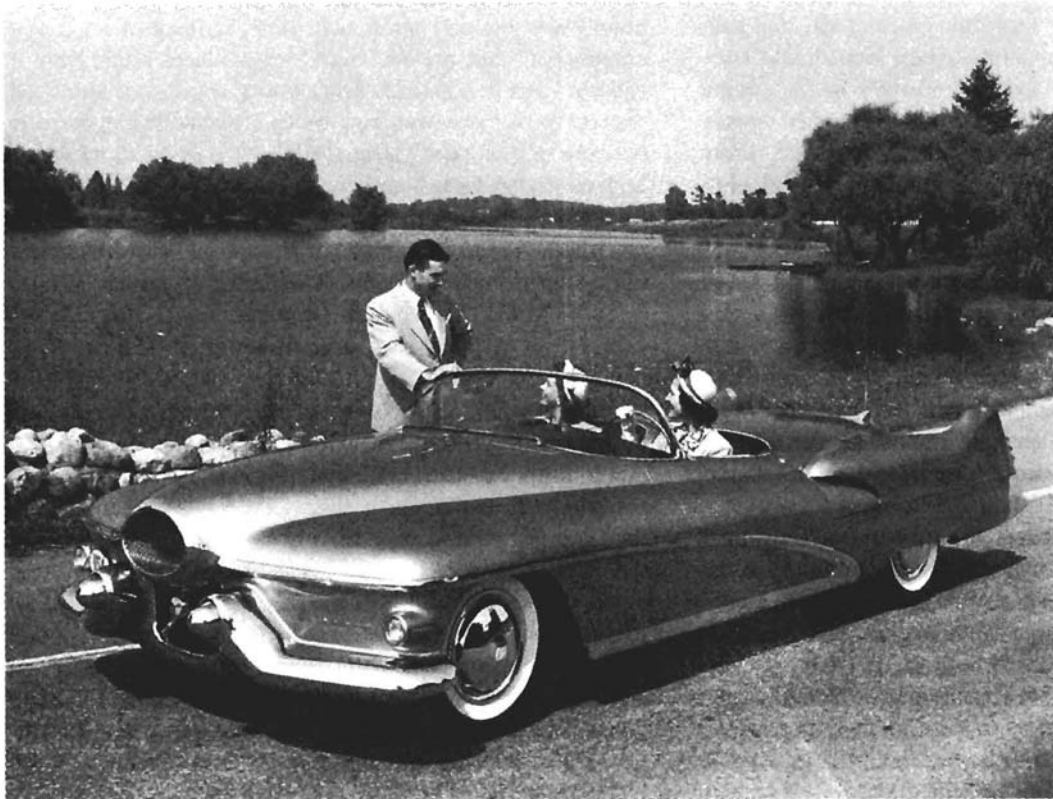
The function of the German *Mittelstand's* machine-tool design sector illustrates the point most clearly. The past economic history of U.S. manufacturing—as far back as *Monitor*-builder Ericsson, and earlier—illustrates the same point; the Germany case is more sharply focussed; but, the case of the conflict between the policies of Edison and Henry Ford, against those of Wall Street's General Motors, should be introduced to put the German case in its proper focus.

Under the influence of the Germany-educated, Gauss and Humboldt ally, and great-grandson of Benjamin Franklin, Alexander Dallas Bache, middle through late Nineteenth-Century science, agriculture, industry, and education, in the United States and Germany, were functionally closely interlinked in their development. In those days, Germany-linked Harvard University was a most eminently respectable, leading scientific institution. Exemplary of the Bache connection, are the interlinked cases of Bache-circle-sponsored Thomas Edison, Rathenau and Siemens in Germany, and the Edison-related case of industrialist Henry Ford. The United States, too, had a deeply embedded, Germany-like machine-tool-design tradition, until the heritage of Confederacy-linked Presidents Teddy Roosevelt and Ku Klux Klanner Woodrow Wilson signalled the Twentieth-Century process of destroying the patriotic and scientific tradition of the United States from within.

Henry Ford conceived of his "Model T" as a household "capital good." In rural areas, where it was well-intended for the challenge of deep-rutted muddy tracks sometimes used as if they were roads, it carried passengers, sawed wood, doubled as a tractor, and improved significantly, in vintage, from year to year, without significantly manifest concern for subtly sexual factors in seasonal styling. As General Motors emerged to challenge Ford's emphasis on technology, it brought with it the brothel-like artistic sensibilities of Manhattan's Seventh-Avenue Knock-Down industry and Hollywood's sleazeball notions of Prohibition-Era "Class."<sup>20</sup> Ford had the industrialist wisdom, but Wall Street had its hand on the spigot of big cash, and eventually Wall Street's accountant-errand boy, Robert McNamara, was installed as a kind

19. Romanticism, Modern, or Country-&-Western, or Rock correspond only to the bestial depths of soupy or satanic eroticism.

20. E.g., "Does the blonde model come with the car, like it says in your ad?"



*A General Motors Le Sabre, the most famous of GM's parade of "dream cars." "As General Motors emerged to challenge Ford's emphasis on technology, it brought with it the brothel-like artistic sensibilities of Manhattan's Seventh-Avenue Knock-Down industry and Hollywood's sleazeball notions of Prohibition-Era 'Class.' "*

of Gestapo figure at Ford.

Almost nobody in the U.S.A. knows anything important about production any more. Fifty years ago, even thirty years ago, as much as sixty percent of the U.S. labor-force was involved in agricultural or industrial production, or in some functional relationship to constructing, operating, or maintaining basic economic infrastructure. Most products were designed with the intent that they might be repaired cheaply, easily, and effectively, and a large ration of citizens, and adolescents, too, could perform significant repairs on most of the products which came into their possession. We were a production-oriented culture, and our ideas about consumption were rooted in that quality of culture. In today's U.S.A., that culture went down the tubes with the passing of the World War II generation from the leading positions of authority in the family, as in government, in education, and in management of leading firms. Largely as a result of that cultural change of the recent thirty years, our economy has gone down the drain, too, and at a presently accelerating rate.

Now, more and more view production with that same immoral mind-set otherwise seen when today's prospective heirs and Wall Street's health-management fanatics join forces to extol the serenity of "death with dignity" to family members reaching or past retirement age.

Until about thirty years ago, when we went collectively mad, production used to be a pipeline, through which the benefits of technological progress flowed more or less contin-

uously. For the production manager, who was concerned with products to be put on line as much as five to ten years hence, and with the phase-out of obsolete or worn-out plant and equipment a dozen or so years ahead, the "pipeline" was a process, filled with planning of future technological change in products and processes. The scope of any respectable firm's planning function was seldom less than a generation's span. Key to the technological change constantly in progress in any such large firm, was the role of the relatively small, high-technology firm which specialized in a range of machine-tool design and related specialties. The competitiveness of production, respecting quality of product and productivity, was derived from a relatively continuous process, generally hidden from the public—behind the scenes, so to speak, of technological improvements in product and processes.

View that "relatively continuous process . . . behind the scenes, . . . of technological improvements in product and processes," from the vantage-point of the general physical-economic function identified here at several points earlier. That the ratio of "free energy" to "energy of the system" must not decline, despite a constant, required increase in "energy of the system," per capita of labor-force, per family household, and per unit-area. It is the constant increase of productivity and product quality supplied to the productive process, chiefly through the machine-tool-design factor, which meets that requirement. The requirement is not satisfied by "getting cheaper parts from elsewhere"; it requires securing a cheapen-



ing of the effective cost by relying upon sources which have high rates of technology-driven improvements in productivity and product.

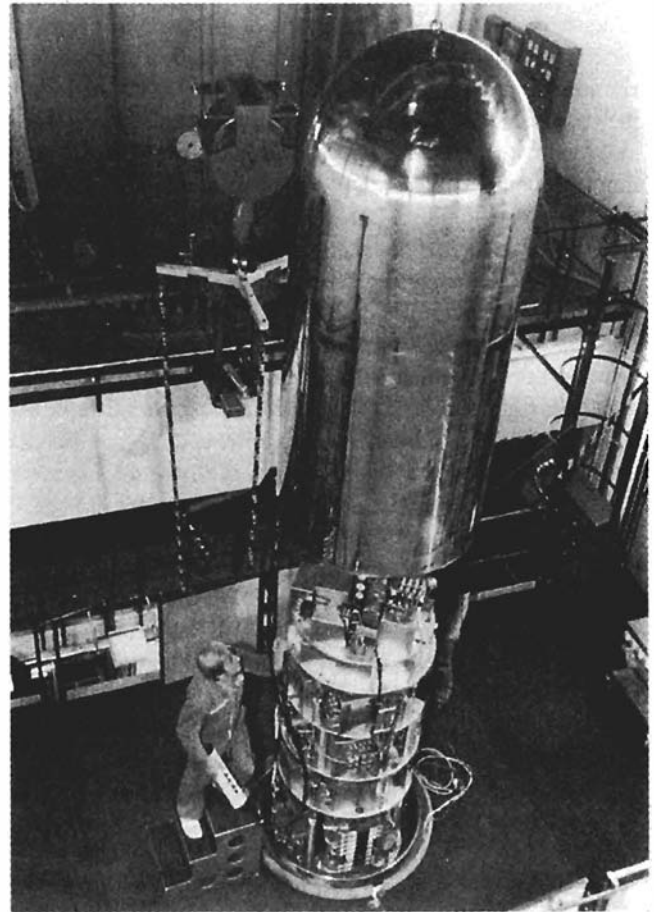
Very few of today's "third-world" countries are reliable sources for this purpose. India could be; it has the relatively largest machine-tool component of its industry. The Philippines used to have such a potential, centered around the military bases at Clark Field and Subic Bay. Argentina used to have a very high potential, until we destroyed one of the world's most productive economies there. At the same time, developing nations have very poor development of infrastructure, and poorly educated general labor forces; for highly skilled professionals in those nations, the relevant employment opportunities available to the most highly qualified, are chiefly the dwindling markets in Europe and North America. "Out-sourcing" from such "cheap-labor" markets, is the kind of policy no competent production executive would encourage; it is the Yuppies in the New York City financial center's lunacy-mills, or useless "good old boys" of the mint-julep circuits, who delude themselves that "cheap" is intrinsically more profitable.

The secret of sustainable economic growth and profit, is high rates of high-density technological progress in every possible pore of the productive process. It is not how cheaply we might import from cheap-labor markets abroad; it is not simply a matter of whether we are exporting jobs our people need. It is the density of such technological progress in production, per capita, per family household, and per unit-area in one's own national economy, which determines whether one's national economy is growing, as ours used to do, until about thirty years ago, or, like our own today, collapsing into bankruptcy through the kinds of policies which have taken over the United States during the past thirty years, up through the present day.

So, Lopez's former reign at Volkswagen represents two relevant types of blunders commonplace in Europe and the United States today. The idea, that a firm such as VW might have an advantage in swiping inventions from a General Motors, for example, shows intrinsic economic incompetence in the management which condones such practice. It is the development of captive pipelines of continued inflow of front-line technological advances, as an integral part of the operational policy of the industrial firm, which is the well-established secret of successful, long-term industrial management.

The turn of Germany's and U.S. firms to "out-sourcing," instead of fostering domestic machine-tool-design resources, is a kindred show of managerial incompetence. Buying components from a market which has low-density machine-tool-design fertility, is such an obvious blunder, of buying into assured obsolescence, that the practice could be condoned only by boards of directors which lack both the mental ability to remember yesterday, and to foresee tomorrow.

The principle is: do not think of this as a matter of buying products; it is a matter of buying change. When you buy a



*Assembly of an electron accelerator at the Hahn-Meitner Institute in Berlin. "The secret of sustainable economic growth and profit, is high rates of high-density technological progress in every possible pore of the productive process."*

product, are you also buying into the quality of change you will need for tomorrow? Are you buying into yesterday, or tomorrow? Production, and successful national economy, are both all about technological change. Therefore, the board of directors member, or operating executive, who does not understand that, should be fired with the same sense of urgency prompted by the detection of a chronic embezzler, pyromaniac, or axe-murderer in those positions.

Behind all this, is education, as Lothar Komp stresses the relevant point. The transmission of knowledge from the education and scientific-research institutions, into production, occurs chiefly in the conversion of validated experimental designs for proof of principle into the form of machine-tool designs by organizations such as the *Mittelstand* firms on which Komp focuses our attention.

This is the structure for technological progress: From Education, to Experimental-Scientific Discovery, to Machine-Tool Design, to Production Process and Basic Economic Infrastructure, to Product and its physical distribution. This structure is rooted in natural principles; but, the elaboration

of such a structure into the realized institutional forms of modern nation-state economies, is a production of a political-economic revolution launched by the 1439-1440 sessions of the great ecumenical Council of Florence. The keynote of that effort, was the building up of France's Dauphin, preparing him to become the Louis XI who established the first known nation-state in human existence: a society in which the intelligentsia drawn from the educated portion of a general citizenry emerged to challenge the reactionary authority of both the landed and financier oligarchies of feudal Europe. The process of state-backed educational programs, to transform growing portions of the ordinary citizens into a national intelligentsia, while fostering high rates of infrastructure-building, and agricultural and industrial progress, is the germ, planted in Louis XI's France, out of which the modern European nation-state economy developed, a revolutionary change in political society and economy, which, despite all evils perpetrated in the name of European civilization during this same period, had resulted, until thirty years ago, in the highest rate of progress in the human condition, in the planet as a whole, qualitatively greater than in all human existence earlier.

Without the appropriate quality of education, the kind of education which has been systematically destroyed during the past thirty years, the entire system of modern civilization must collapse into a "new dark age," whatever other errors of policy

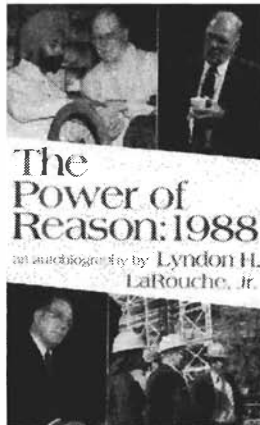
might affect the economic process. Without the fostering of high rates of experimental-scientific research, the economy must collapse, whatever the quality of other aspects of economic policy-shaping. Without the link between science and production provided by the sector of the economy devoted to machine-tool design, a similar catastrophe becomes inevitable.

In the final analysis, all that we have said here, all that is stated and implied by Lothar Komp's accompanying report, returns us to the point we have made in condemning generally accepted classroom economics doctrine for the "crime" of proposing, implicitly at least, either that it is commodities which produce commodities, or, worse, that it is financial capital which earns profit. The principle upon which the possibility of continued existence of civilization depends, is that principle of universal history, that continued human existence, and the further development of that human existence, depends absolutely upon valid changes produced by the not-entropic characteristics of the sovereign, creative-cognitive processes of the individual human mind. That is the principle one sees most plainly exposed in action, in the role of the German *Mittelstand's* machine-tool-design sub-sector. That is the capacity to survive, which is being presently destroyed in the United States by the recent and present official policies of the U.S. government and financial community.

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—Former U.S. Attorney General  
**Ramsey Clark**

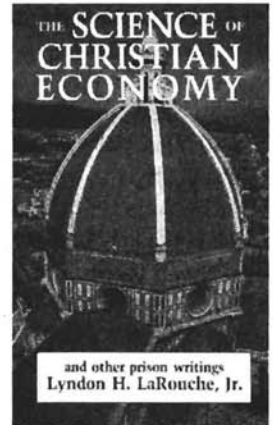


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