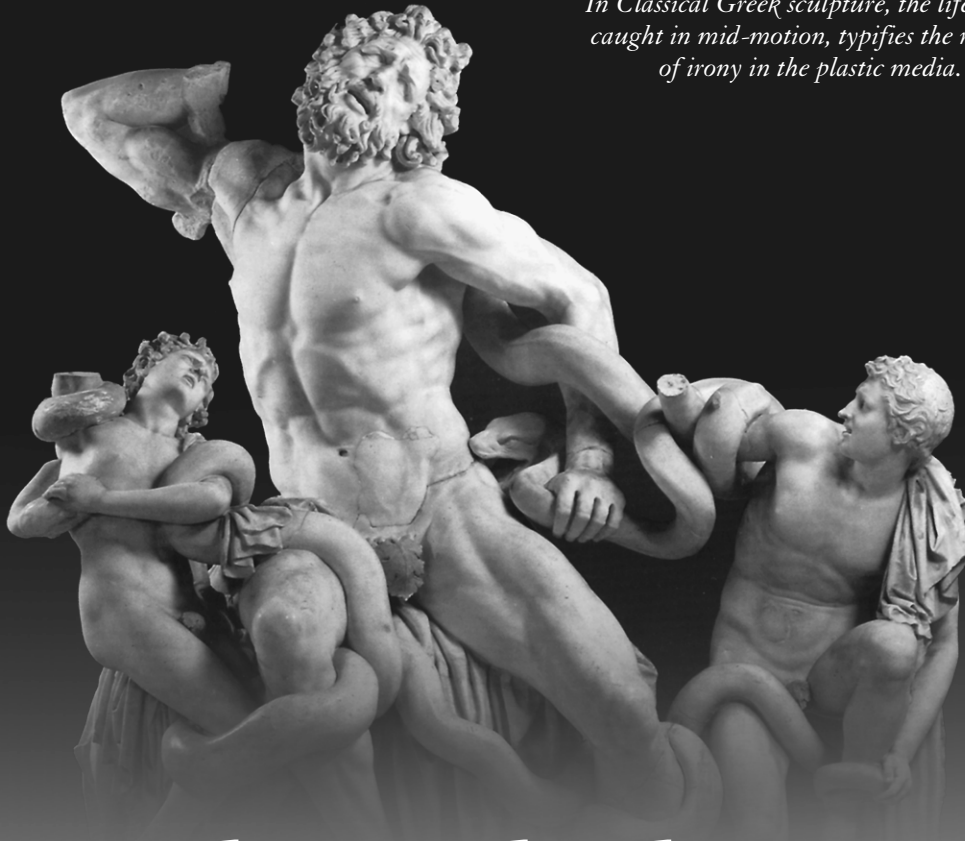


In Classical Greek sculpture, the life-like effect of an image, as if caught in mid-motion, typifies the role of metaphorical qualities of irony in the plastic media. Shown: Laocoön, 42-21 B.C.



Behind the Notes

by Lyndon H. LaRouche, Jr.

March 9, 1997

The preceding volume, Book I of this two-volume Manual, addressed the basis for music in that mode of use of the human singing voice, the which combines the Florentine *bel canto* method of voice-training, with the development of well-tempered polyphony by Johann Sebastian Bach.¹ The present volume, Book II, addresses the application of those principles of vocal polyphony to performance of those Classical compositions, and perfected folk-song,² both vocal and instrumental,

which conform to the standard of *motivic thorough-composition* which Wolfgang Mozart developed, in Vienna, during the first half of the 1780's. The function assigned to the present volume, is to present those inter-connections both to the advanced student, and to that student's teacher.

Excepting unavoidable references to that portion of the work by J.S. Bach, which established the indispensable foundations upon which Mozart's development of principles of *motivic thorough-composition* was

This article will appear as the Introduction to Book II of the Schiller Institute's "Manual on the Rudiments of Tuning and Registration." Book I, "Introduction and the Human Singing Voice," was published in 1992.

1. *A Manual On the Rudiments of Tuning and Registration*, ed. by John Sigerson and Kathy Wolfe (Washington, D.C.: Schiller Institute, 1992). Subsequent German and Italian editions have been published: *Handbuch der Grundlagen von Stimmung und Register*, trans. by Werner Hartman (Wiesbaden, Germany: Dr. Boettiger Verlag-GmbH, 1996); *Canto e diapason: Un manuale con oltre mille esempi tratti dalla creatività classica e lirica* (Bergamo, Italy: Edizione Carrara, 1996).

Is it not the case, that the architecture of natural polyphony, and of the domain of tonality, functions in music as geometry functions in the domain of physical science?

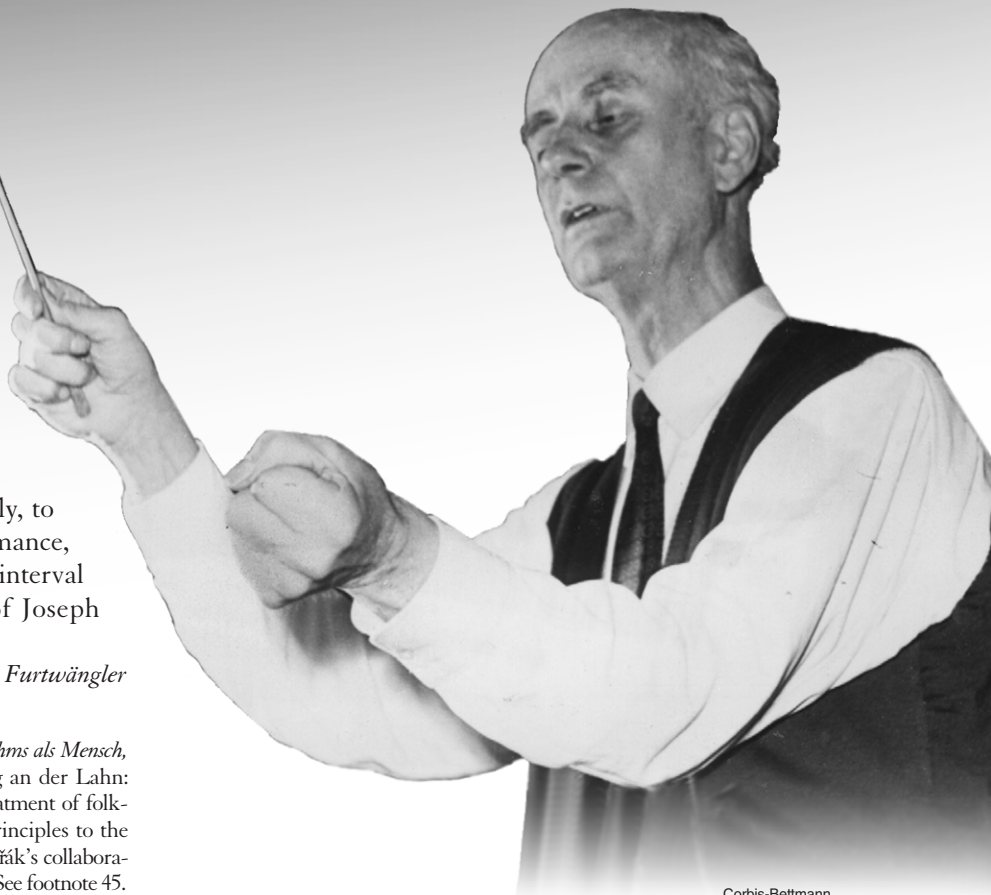
Is it not the case, that the human mind, over millennia of development of civilized life, has discovered, in geometry, a natural expression of the way in which the human mind is organized, to the effect of generating, and elaborating those discoveries upon which mankind's increased mastery of nature depends?

Is it not the case, that that long process of man's development of music, leading through J.S. Bach's development of well-tempered polyphony, the which made possible, directly, Wolfgang Mozart's discovery of his principle of motivic thorough-composition, is nothing but the process of uncovering, phase by phase, not only a less imperfect comprehension of the natural predisposition of the human singing voice, but also the way in which music might, less imperfectly, evoke that emotion of agapē which is the innermost, underlying quality, expressing man's nature, as Plato, and the Apostle Paul understood this?

premiered, the present book focusses upon examples from the work of Classical composers from Haydn and Mozart, until the last compositions of Johannes Brahms. Within the following chapters, the treatment of the instruments is limited, chiefly, to that evolution of instruments, of their performance, and of ensembles, which occurred during the interval beginning with relevant early influences of Joseph

Conductor Wilhelm Furtwängler

2. Cf. as referenced in Book I, Gustav Jenner, *Johannes Brahms als Mensch, Lehrer und Künstler: Studien unter Erlebnisse* (Marburg an der Lahn: N.G. Elwert'sche Verlagsbuchhandlung, 1930). The treatment of folk-song by Brahms, and the application of these same principles to the American Negro Spiritual by Antonin Dvořák and Dvořák's collaborator, Harry Burleigh, typifies this important qualification. See footnote 45.



Haydn, and ending at the coincidence of three interrelated, relevant, political developments: Lord Palmerston's 1848-1849 wave of "Young Europe" revolutions; the emerging hegemony of anti-Classical, Romantic trends in arbitrarily elevated tuning; and, the anti-vocal redesign of the tuning and registration of wind and other instruments.³

The origins of Book II are now identified by aid of two relevant anecdotes. The first, whose beginnings date from early 1946, is as follows.

During early 1946, the writer of this introduction returned to India, a music-starved veteran of military service in northern Burma. The sparse collection of records available from the Red Cross, at the U.S. Replacement Depot outside Calcutta, included nothing better than an HMV recording of a Tchaikowsky symphony, but in a performance under the celebrated conductor Wilhelm Furtwängler. It was the writer's first actual hearing of a Furtwängler performance. From the opening, the writer was, without exaggeration, virtually frozen in his seated position; the performance was stunning in its relentless suspension, its remarkable coherence, from opening to close.⁴ That reaction was not merely a result of coming fresh from a prolonged thirsty period in a musical desert. As later experience showed, under any circumstances, Furtwängler represented qualitatively better direction than the writer had ever heard before that moment in early 1946. Later, the writer learned of the phrase which Furtwängler employed to describe this stunning advantage: *perform-*

*ing between the notes.*⁵ Since that first hearing of Furtwängler's conducting, that experience has dominated this writer's relationship to music, in the most compelling fashion and degree.

Later, back in the U.S.A., this writer heard the report that certain agencies professed, that they had discovered a "Nazi" quality in Furtwängler's role as a conductor. Since this writer had heard the recorded Tchaikowsky performance in early 1946, and, later, other performances conducted by Furtwängler, he knew the charge to be false. The first, 1946, hearing of the great conductor's work, had provided a deep glimpse into the inner workings of the conductor's mind; that was no Nazi. During the 1970's, this judgment was buttressed by access to the facts about the crafting of the charge by Hans Haber, Margaret Mead, *et al.* There was no doubt that the charge had been entirely fraudulent.

For that controversy, the relevant term of reference, is *agapē*, as Plato defined it. The Nazis, including Martin Heidegger, like Heidegger's admirer, Hannah Arendt, as also Margaret Mead, Theodor Adorno, and as the proto-Nazi Friedrich Nietzsche and Richard Wagner, or, the irrationalists Bertolt Brecht, Heidegger clone Jean-Paul Sartre, or Sartre's Simone de Beauvoir, were embodiments of anti-*agapē*. The essence of Furtwängler's musical performance, like that of the compositions of Mozart, Beethoven, and Brahms, is *agapē*. The musical significance of that concept, is the seed-kernel, and pervasive principle underlying the presentation of music in this present volume.

Back in the U.S.A., this writer devoted a significant ration of his time to exploring the mystery: What was Furtwängler's secret? The most likely clues to discovering the principle involved, might be provided by examples from the German *lied*, as performed by the best singers among Furtwängler's contemporaries, by the Italian vocal repertoire of Giuseppe Verdi, and by close study of the instrumental works of Wolfgang Mozart, Beethoven, Schubert, Schumann, and Brahms. After a few years, this line of inquiry was focussed upon that centerpiece for the study of motivic thorough-composition, the Mozart K. 475 Fantasy. This composition, which had been derived, among other relevant Mozart works, from the discovery contained within J.S. Bach's *A Musical Offering*, seemed to provide a bench-mark,

3. The first official effort to depart from Bach's well-tempered C=256, to the Russian bandmaster's A=440, was ordered by agents of the Holy Alliance powers, in the setting of the Congress of Vienna. Later, a more insidious effort to enforce what mere decree had failed to bring about, occurred with the redesign of wind instruments, and also keyboard instruments, with a built-in registration which was shifted away from the natural registration of the *bel-canto*-trained human singing voice. This latter change gained momentum under the conditions provided by Palmerston's 1848-1849 revolutions. Those "Young Europe" revolutionaries, as typified by the cases of Richard Wagner and his bomb-throwing crony, and fellow-Beethoven-hater, N. Bakunin, also marked the unleashing of a more concerted effort to supplant the Classical tradition of Bach, Haydn, Mozart, Beethoven, *et al.*, with the irrationalist Romanticism of Carl Czerny's Franz Liszt *et al.*

4. At a recent time, even after hearing sundry Furtwängler recorded performances many times, this writer was taken by surprise once again, recapturing the same kind of "Furtwängler effect" which he had experienced on the referenced 1946 occasion. This time it was a first hearing of the Furtwängler direction of the Franz Schubert Ninth Symphony, as performed at Berlin's Jesu-Christus-Kirche, in December 1951 [Polydor International GmbH, Germany: Mono 427 405-2].

5. The alternative expression is ". . . from behind the notes." In the interest of reaching for greater conceptual transparency, the present writer's own choice, would be *performing from behind* (*var., beneath*) *the intervals*. For the functional significance of such distinctions, see below.

or, perhaps, a kind of “Rosetta Stone,” for the tracing of methods employed by Furtwängler, as derived from a basis pervading the work of such Classical composers as Mozart, Beethoven, Schubert, Schumann, and Brahms.

There were numerous coincidences, but never anything merely accidental about the writer’s dedication to this implication of Furtwängler’s conducting. Before the war, as an adolescent, this writer had become a convert to the scientific world-outlook of Gottfried Leibniz. Several notebooks, containing the writer’s notes on Kant and Leibniz, dating from the present writer’s mid-adolescence, turned up several decades later. The author was amused to recognize himself in this mirror of his youth: these contained the kernel of a competent refutation of that attack on Leibniz which is central to Immanuel Kant’s *Critique of Pure Reason*.⁶ What had gripped this writer so strongly, from the first, 1946, hearing of Furtwängler’s work, was, that the effect of the contrast of Furtwängler’s direction, to that of familiar conductors, was identical to the distinction, in *type*⁷ of quality, which separates the transparency and vitality of Leibniz, from the Romantic irrationalism permeating Kant’s sterile doctrine for aesthetics.

Furtwängler’s mastery of performing from “behind the notes,” expresses a method which may be readily observed, as practiced, in one degree of approximation or another, by the best musical artists. It is not a formal topic of the customary textbooks, and certainly not often met on the dust-jackets of recorded performances. It is a method which need be developed by the student and professional, a method which requires mastery of an accumulation of great musical learning, but, to be developed so, requires that an inclination for it must be there at some early stage of the artist’s development.

In the master-class, such as the recorded sessions with the great Pablo Casals, and in kindred settings, one often sees the master employ this method in a way which is

accessible, and very moving for sensitive young artists. Yet, often, a master insists, that he, or she could not imagine how the principle might be communicated, other than by means of demonstrations appropriate to a specific musical situation, a specific performance problem. This latter practice is irreplaceable; but, it is possible, and necessary, to render the principle itself transparent. That is the pervading task which characterizes the method employed for Book II.

Until the late 1970’s, this writer’s attention to such musical matters occupied an important niche, an integral but secondary feature of his work on the epistemological side of scientific and technological progress. It was located, notably, as an essential, correlated feature of his definition of human creativity as such. However, this was only a niche, if a crucial one, in the work of shaping of his own original, 1948-1952 discoveries in physical economy. In that work, the crucial function of metaphor, as the generative principle of Classical tragedy, poetry, and song, was referenced, to show the generality of the same creative-cognitive principle of the individual mind, as in generating and replicating valid revolutionary discoveries of principle in physical science. There, in that niche of the writer’s work, the musical matter remained lodged, until the 1970’s developments which led into production of this *Manual*.

This brings us to the second of the two relevant anecdotes, to events which began approximately thirty years later than the first.

During the early to middle 1970’s, a new organization had been formed, devoted, day to day, to political intelligence, certain scientific work, and related publishing activity. It had developed out of a body of graduate students and others, who were drawn together through a one-semester, introductory course in physical economy, which the writer taught at various 1966-1973 campus locations. It was in this setting, beginning 1978, that this writer recognized the urgency of introducing the principle of musical motivic thorough-composition, as an integral feature of the daily political and scientific intelligence activity of this association.

For the apprehension, in music, of the underlying principles of motivic thorough-composition, it should be noted, that a good quality of political-intelligence product rises above the requirements of ordinary academic professionalism, into regions loosely described as “insight.” These are regions of mental life which Gottfried Leibniz sometimes identified by the term *Analysis Situs*: those relations of ordering which underlie what is usually named the functionally “non-linear” sequences, such as evolutionary sequences of distinct species, among mutu-

6. In defense of Leibniz’s arguments in his writing which was posthumously published as the *Monadology*.

7. The present writer employs the term “type” in the sense provided to mathematics by Georg Cantor’s notion of *the ontologically transfinite*; the writer reads Cantor’s usage from the vantage-point of what Leibniz identified as *Analysis Situs* (see note below). A *type* is a species of those orderings which lie outside the bounds of any deductive/inductive method, as, for example, outside, and above, the virtual-reality domain of today’s generally-accepted classroom mathematics. *Typical* is the distinction, in the domain of experimental physics, between entropic and anti-entropic, non-linear ordering of deductively, mutually incongruent states of a continuing process. The distinction between a living and a no-longer-living process, belongs to this domain of *Analysis Situs*.

ally inconsistent, but coherent processes.⁸

In Classical music, these same considerations are expressed as the deeper, governing principles underlying motivic thorough-composition. In every species of cognition, as in the work of political intelligence, physical science, and Classical composition, it is not sufficient to deduce conclusions from arrays of facts; it is essential to discover, and validate the unifying, underlying characteristic of the contextual situation in which such an array of facts is located functionally.⁹

The motivating state of mind in which such indispensable qualities of “insight” are mustered, is precisely that which we associate with the manifest “insight” of a great performing artist, the quality of “insight” expressed by Furtwängler’s emphasis upon performing from “behind the notes.” Indeed, all great Classical musical compositions, especially motivic thorough-composition, have a common, specific quality, that of celebrating those creative qualities of the individual human mind which we might wish to recognize as the intent of “insight.” This aspect of great, well-performed Classical music, serves society as a well-spring of refreshment and inspiration for those intellectual powers and moral strength, the which might be intended by that term. This use of the term, is that which is equally applicable to every facet of most serious endeavor, in statecraft, and in matters bearing upon the underlying principles of scientific and artistic work.

The purpose of that musical program which was developed, among the writer’s associates, beginning 1978-1982, was to enhance the work-a-day, moral and intellec-

tual creative potential of the association, through broadly representative, regular participation in structured programs of musical activity. During the course of 1978-1982, these programs came to be centered upon regular polyphonic choral activities, which were based, in turn, upon the practiced rigor of Florentine *bel canto* training. To serve the intended purpose, it was essential that the principles governing this activity, be sound ones, conforming to the species-characteristics of individual human creative-cognitive processes, i.e., *reason*, as Johannes Kepler and Leibniz signify the use of that term. It was essential, that those participating in the program should come to recognize, and employ those same principles as part of the musical activity.

From the outset, this program required, that we confront, and overcome a large accumulation of popularized academic, and other, conventional, but false, shibboleths about music. This meant, most notably, the influence upon professionally trained musicians, and others, of that irrationalist, anti-Classical, Romantic and modernist ideology, radiated from such sources as the neo-Kantian Karl Savigny, Hermann Helmholtz, and the followers of Theodor Adorno.

As Book I has already documented that problem, the irrationalist influences over the concert-hall, are typified by Joseph Goebbels’ success, in inducing a pre-World War II, London conference to adopt the Nazi Party’s standard of $A=440$, one of the Nazi crimes against humanity not addressed at Nuremberg.¹⁰ Since World War II, notably under the more recent conditions of ever-greater elevation of pitch (even, sometimes, during a leading orchestra’s

8. An evolutionary sequence of mutually distinct species, is typical of such orderings in general. The notion that sequences of physical systems might be ordered in such a way that the sequence is either entropic, or anti-entropic, lying within what Leibniz defined as the domain of *Analysis Situs*, is exemplary of topics beyond the scope of deductive forms of analysis. To locate the historical origins of the writer’s approach to the subject of the essential role of the concept of time-reversal in understanding the compositional method of motivic thorough-composition, see *Gottfried Wilhelm Leibniz: Philosophical Papers and Letters*, ed. by Leroy E. Loemker, 2nd ed. (Dodrecht, Netherlands: Kluwer Academic Publishers, 1989); “Studies in a Geometry of Situation” (1679), pp. 248-257. The writings which most influenced the present writer’s adolescent thought on the subject of Leibnizian *Analysis Situs* are, as provided in the same current location: “The Monadology,” pp. 643-653, and, from the Leibniz-Clarke correspondence, Leibniz’s 3rd (pp. 682-684), 4th (pp. 687-691), and 5th reply (696-721). See, also, Gottfried Leibniz, *Monadology and Other Philosophical Essays*, trans. by Paul and Anne Martin Schrecker (Engelwood Cliffs, N.J.: Macmillan Publishing Co., 1965). For the related writings of Bernhard Riemann which were the most crucial of the present writer’s readings during 1952, see *Bernhard Riemann’s Gesammelte Mathematische Werke*, trans. by H. Weber (New York: Dover Publications, 1953); see “Über die

Hypothesen, welche der Geometrie zu Grunde liegen (On the Hypotheses Which Underlie Geometry)” (1854), pp. 272-287; see, also, “*Lehrsätze aus der analysis situs für die Theorie der Integrale von zweigliedrigen vollständigen Differentialien*” (1857). Among the present writer’s subsequent readings of Riemann which are relevant to the notions of applied Leibnizian *Analysis Situs*, see, most emphatically, the collection of posthumously published fragments from work of the year 1853 (*I. Zur Psychologie und Metaphysik, II. Erkenntnistheoretisches, III. Naturphilosophie*), pp. 507-538, and, with aid of the preface supplied by M. Noether and W. Wirtinger (pp. iii-vi of the same volume’s appended *Nachträge*), Riemann’s celebrated (1858-1859) “*Vorlesungen über die hypergeometrische Reihe*” (pp. 69-93) points to the kinds of mathematical implications of musical memory’s act of “time-reversal,” which the writer locates as central to the efficiency of Mozart’s discoveries in motivic thorough-composition.

9. Leibniz identified this as the method of “necessary and sufficient reason.” This is the same notion represented by the fundamental discoveries for physics by Bernhard Riemann, respecting the characteristic “curvature” of a specific physical space-time, among an orderable series of what are, from a deductive standpoint, mutually inconsistent such physical space-times. [Bernhard Riemann, “Über die Hypothesen, welche der Geometrie zu Grunde liegen,” *loc. cit.*]

public performance of a single work!), the professional musical careers of singers have come to depend upon conditioning themselves to the irrational standards of elevated pitch and muddled registration, the which have been enforced by the merchants of the concert-hall and recording industry, with such included results as early destruction of potentially outstanding singing voices.

The hard choice which, thus, confronted us, as it does others, was whether to seek out and cling to the truth, or, as most of today's, relatively more vulnerable, younger professionals, and, also, others have done, to submit to what passes today for "politically correct" ideas, of hoaxster Helmholtz, Joseph Goebbels, *et al.*, about professional standards for pitch, registration, and so on. During recent time, the cost to a young professional's musical career, for preferring truth to elevated pitch, might be considerable, even fatal to a young career. In the alternative, the cost which relatively so many do pay, as price for making the "politically correct" choice of success, is the weakening of one's moral fiber, the loss of otherwise attainable benefits of cognitive development of one's mind, and, for some, the additional price, of early end to a promising young singing voice.

During the course of the 1980's, we discovered, that, respecting the crucial issues so confronted, most of the relevant, outstanding musical artists, vocalists most frequently, either agreed with our view, or found the case we presented to be, at least, of significant merit, implicitly consistent with crucial principles. The relevant political problem had been, that these professionals were not organized to fight these issues in that necessary, allegedly egregious manner, to which the writer's association has committed itself in defense of truth, in science and politics.

On those premises, this writer therefore proposed, first during Spring 1981, that his relevant associates commit themselves to producing a music manual. It was proposed, at that time, that this manual, when published, would serve as the guidon, around which to rally ourselves, and also others, to the cause of music, to the defense of what Johannes Kepler and Leibniz termed

10. The first effort to institutionalize A=440 was a conference organized in 1939 by Nazi Propaganda Minister Joseph Goebbels, who had standardized A=440 as the official Nazi German pitch. Professor Robert Dussaut of the National Conservatory of Paris told the French press that, "by September 1938, the Acoustic Committee of Radio Berlin requested the British Standard Association to organize in London a congress to adopt internationally the German Radio tuning of 440 periods. The congress was held in London, a very short time before the War, in May-June 1939. No French composer was invited. The decision to raise the pitch was thus taken without consulting French musicians, and against their will." *A Manual On the Rudiments of Tuning and Registration, op. cit.*, p. 15.

reason, against the irrationalist arrogance of Kantians, neo-Kantians, and contemporary cultural modernity and *kitsch*. At the outset, the premise for undertaking such publication, was not that we possessed, then, even the majority of the answers we must address, but that, by adopting the task, and preparing to state a case publicly, we would oblige ourselves to do the preparatory work, as we were accustomed to prepare our published scientific and political intelligence work-product: in such a way that what we developed for publication, would be nothing of which we need be ashamed before the eyes of the best past or future composers and performers.

So, the success of Book I was effected. So, a comparable usefulness, and, above all, truthfulness, is sought for Book II.

What Lies Behind the Notes?

Focus now, upon the functional significance of the writer's preferred rephrasing of Furtwängler's utterance, "performing from behind the intervals." For the purposes of discussion of the following topic, reference the illustrative case provided by Wolfgang Mozart's (K. 618) motet, *Ave Verum Corpus*.¹¹ In short, focus upon that role of the principle of *memory of the future*, which plays a determining role in defining the success of the composition, or performance of all Classical art-forms, motivic thorough-composition most emphatically.

To situate the reference to motivic thorough-composition for this purpose, the following set of observations is supplied.

First, until the very early 1990's, when Maestro Norbert Brainin pointed out an earlier, crucial discovery of his own on this matter,¹² the present writer had attributed the development of Classical motivic thorough-composition, entirely, to Mozart's original, Bachian discoveries of the early to middle 1780's, as reflected in works such as his six "Haydn" quartets, and, as noted above, the K. 475 keyboard Fantasy. Focus upon the K. 475 Fantasy. Once this work were reexamined, both from the standpoint of what is made possible by

11. See Mindy Pechenuk, "Mozart's *Ave Verum Corpus*: A Crucial Proof of Mozart's Discovery, and a Short Pedagogical Exercise in Musical Memory," *Fidelio*, Winter 1996 (Vol. V, No. 4), pp. 34-45.

12. On this specific matter, see Lyndon H. LaRouche, Jr., "Musical Memory and Thorough-Composition," *Executive Intelligence Review*, Sept. 1, 1995 (Vol. 22, No. 35), and "Norbert Brainin on *Motivführung*," *Executive Intelligence Review*, Sept. 22, 1995 (Vol. 22, No. 38) [also *Fidelio*, Winter 1995 (Vol. IV, No. 4)].

J.S. Bach's development of well-tempered vocal polyphony, and from the standpoint of "musical memory" in performance of compositions reflecting Mozart's contribution to development of Classical motivic thorough-composition, the apparent "secret" of Wilhelm Furtwängler is rendered a transparent principle.

At this moment, the writer must invade the innermost privacy of the reader's mind. What is music? Put aside all of the typical varieties of sophistry, invoked by those, such as writers of program notes and recording dust-jackets, who seek to divert attention from the deep implications of that question. Address the underlying substance of the matter. In which experience, within the sovereignly private, cognitive processes of the individual mind, might we recognize the relevant principle efficiently at work?¹³ What is the quality of experience, within the sovereign bounds of the individual cognitive processes, within which one encounters the specific phenomenon which corresponds to the Classical mode of composition and performance? By what means can we supply a rigorous proof of the existence, and efficiency of that principle?

More narrowly, what lies within the experience of such music, the which has a specific power to engage an inner passion of the mind with the compelling attraction which a Bach, Mozart, Beethoven, Brahms commands among musically literate persons of high-grade cognitive and moral development? Or, to say the same thing: what is the essential difference, between passably competent, Classical performance of a Mozart, Beethoven, or Brahms composition, and what is arguably a technically accomplished (by typical contemporary standards) travesty, ostensibly in performance of the identical set of notes?

The only precise, and also concise answer, invokes the meaning of a Classical Greek term, *agapē*, as that term is defined by Plato, and as the Christian Apostle Paul, as in his I Corinthians 13, adopts fully and exactly Plato's meaning for that same term.¹⁴ This quality takes us to the core of that which sets the characteristic feature of the individual member of the human species, apart from, and absolutely above all other living species. It is the core of what we know as Classical music, as this may be traced through J.S. Bach's revolution in well-tempered polyphony, into the discovery and development of the method of

motivic thorough-composition by Wolfgang Mozart, Beethoven, Brahms, *et al.*¹⁵ The essence of great Classical composition and performance, is *agapē*.

Locate this quality of *agapē* in the domain of scientific creativity. Then, once that is done, bring the insight so developed back to the corresponding features of Classical composition.

In researches into the deep, pre-historic past of mankind, our ability to demonstrate that certain spoor should be assigned to the presence of *homo sapiens*, rather than, perhaps, some higher ape, depends upon showing a rigorously defined, cognitive factor, in the situation, as implied by the evidence. The proof for existence of that cognitive function is betrayed only for the case, in which the spoor betrays an antecedent act of discovery which is of the type we associate, in modern times, with a valid discovery of physical principle.

In modern scientific vocabulary, this definition of "principle" coheres with Bernhard Riemann's 1854 revolution in a physics viewed from the standpoint of higher geometries. In that sense, a valid principle is defined as that experimentally-based, rigorously defined discovery, the which obliges science to depart a physical space-time geometry of "*n* dimensions," for a superior geometry of "*n+1* dimensions."¹⁶ To restate that fairly in simpler, layman's terms: a validated new "axiom" of scientific knowledge, overturning previously accepted belief and practice. Implicitly, Riemann's method provides the archeologist with an exact standard to be applied as the indicated distinction between clearly human and merely ape-like activity.

There are two characteristic moments within scientific education and practice, which may be conveniently referenced as a way of affording the reader an indication of the kind of experience in which the efficient quality of *agapē* may be most readily, directly experienced as a distinct phenomenon. In the first case, the experience of the actual mental act of creating the idea which corresponds to a validated discovery of a new principle of nature. The

13. The writer employs the term "cognitive" to signify that feature of human mental processes which sets man absolutely apart from, and above all other living species: the quality which Immanuel Kant relegates to his poorly defined purgatory of synthetic judgment *a priori*, the quality of reason which exists entirely outside the narrow realm of Kant's understanding.

14. E.g., Plato, *Republic*, Book II: The difference in definition of the passion for justice (and, truth) among Socrates, Glaucon, and Thrasymachus.

15. In the discussions which occurred on the matter of selecting content for the composition of this Book II, the present writer had proposed an editorial plan in which the presentation of the modern instrumental palette, would adopt, as a point of departure, the difference in methods of composition of ensembles, which are best typified by comparing the work of C.P.E. Bach with that of a dedicated student of C.P.E. Bach's work, Joseph Haydn. In response to hearing of this proposal, Norbert Brainin exclaimed, "*Motivführung!*," and pinpointed Haydn's six string quartets, Opus 33 (the "Russian Quartets"), as the more than likely prompting for Mozart's own, subsequent discovery and development of what became, from approximately 1782-1783 onward, the Bachian approach to motivic thorough-composition of Mozart, Beethoven, Brahms, *et al.* See footnote 12, above.

16. See footnotes 8 and 9, above.

second, is the experience of reenacting, in one's own mind, the mental experience of an original such discovery by another, historic, or other individual personality. Once that recognition is established for these clinical cases, it is then feasible to explore other topics, including motivic thorough-composition, for similar consideration.

The master's act of composing a Classical piece of motivic thorough-composition, and the insightful performer's presentation of the master's act of discovery, are analogous to the mental experiences enjoyed, respectively, by the original discoverer of a valid scientific principle, or, by the student who reenacts the mental experience of that original discovery. The essential quality of such mental acts, whether in science, in Classical music, or other expressions, is always the same; there is no difference between science and art, respecting the commonly underlying principle of individual human creativity.¹⁷

It is within those acts of discovery, whether in science, or in art, that we find the primary habitat of the special quality of intellectual motive power—i.e., *emotion!*—which Plato and the Apostle Paul identified commonly as *agapē*.

Creativity: The Non-Euclidean Model

The conceptions we are about to introduce at this point, are crucial. The reader is requested to follow each of the steps of the argument which follows, perhaps retracing

this argument several times, until the conception being presented becomes transparent.

As already indicated, the author's relevant discoveries, circa 1948-1952, respecting the epistemology of scientific and technological progress, were premised upon a deep commitment to Leibniz's outlook. That commitment was established during the writer's adolescence. It is relevant to note here, that that adolescent's grounding in Leibniz, had been developed, first, in opposition to British empiricism, and to Descartes. Later in his adolescence, the commitment had undergone further development, in countering the anti-Leibniz characteristics which he identified, at that time, with his study of I. Kant's *Critique of Pure Reason* and *Prolegomena to Any Future Metaphysics*. Still later, beginning 1948, the principal provocation which set the relevant discoveries afoot, was the fraudulent claim, by Massachusetts Institute of Technology (M.I.T.) Professor Norbert Wiener. Wiener claimed to have reduced human conceptions and their communication to a subject of what was described as "statistical information theory." It is crucial to the expository report supplied here, that the present writer's adolescent grounding in the Leibniz-Kant and related controversies of the Seventeenth and Eighteenth centuries, provided the essential standpoint from which the refutation of Wiener's radically positivist, neo-Kantian claim was undertaken.¹⁸

The issue posed by the wild claims of Bertrand Russell students Wiener, John Von Neumann, *et al.*, represented a

17. The contrary, irrationalist view, is at the center of the pervasive dogma of I. Kant's *Critiques*. Kant's irrationality is heavily underscored, respecting art as such, in his *Critique of Judgment*. This is the crucial point on which Friedrich Schiller warned his followers, such as Wilhelm von Humboldt, against the perniciousness of Kant's influence. Schiller's warning against Kant, is echoed prophetically by the anti-Romantic Heinrich Heine, in his *Religion and Philosophy in Germany*. During the Nineteenth century, G.W.F. Hegel's chief political ally, Professor Karl Friedrich von Savigny, took Kant's irrationalist dogma in aesthetics as a point of departure for decreeing a hermetic separation of *Geisteswissenschaft* (e.g., art) from *Naturwissenschaft*, science. Savigny's neo-Kantian irrationalism [of *Geisteswissenschaft* versus *Naturwissenschaft*] became the widespread premise for the apologies made in defense of Nineteenth-century, anti-Classical Romanticism, such as that of Franz Liszt, erstwhile pupil of [Ludwig van Beethoven: "that criminal!"] Carl Czerny, and also, later, the apologies for virulent, anti-Beethoven irrationalism of Richard Wagner.

18. Norbert Wiener, *Cybernetics* (New York: John Wiley, 1948). Wiener, a radical positivist in the tradition of Ernst Mach and Bertrand Russell, adapted the H-theorem, ironically, from the statistical mechanics of the anti-Mach, anti-positivist Ludwig Boltzmann, purporting, thus, to derive human thought and its communication from the kinetic theory of gases. Wiener relied upon the fact [see Morris Levitt, "Linearity and Entropy: Ludwig Boltzmann and the Second Law of Thermodynamics," *Fusion Energy*

Foundation Newsletter, Sept. 1976], that Boltzmann's ("H-theorem") formulations allow for a relatively improbable, local reversal of entropy; this served Wiener's purpose, of providing a seemingly rational (e.g., mathematical-physical) basis for measuring human ideas as a relative increase in order in a purely local aspect of a kinematic domain, thus measurable in terms of negative values for Boltzmann's H-theorem. There are weaknesses in Boltzmann's own work, when it is extended beyond the bounds of its axiomatically assumed special case; these fallacies arise from accepting the hereditary assumption of "linearity in the extremely small," of Rudolf Clausius' and J.C. Maxwell's relevant dogmas; but, the fallacies imposed upon Boltzmann, posthumously, after 1906, by such among his radical-positivist adversaries, and survivors, are entirely the concoction of the latter. It is notable, that the conception of the universe inhering in the relevant work of Wiener and Von Neumann, is traced, without interruption, from the "kinetic" social theory of Hobbes' *Leviathan*, via that Hobbesian "hedonistic calculus," of Giammaria Ortes and Pierre-Louis Maupertuis, on which Bentham relied in his *Introduction to The Principles of Morals and Legislation*, his *In Defense of Usury*, and his *In Defense of Pederasty*. Thomas Malthus' plagiarizing of the same Giammaria Ortes' 1790 publication on population, is part of the same set. It should be noted that Wiener's "information theory," and Von Neumann's theory of the brain, are each copies of the argument demanding the ban of metaphor from the English language, in Hobbes' *Leviathan*.

continuation of a central point of a shared tradition of several centuries, among the British empiricists and their allies, since Thomas Hobbes' *Leviathan*. Like Hobbes, the empiricists, Kantians, neo-Kantians, and positivists, have made it a cardinal precept of their dogma, that *metaphor* does not exist, because, they argue, it should not be permitted to exist. This same contention is the underlying assumption, and motive of Kant's *Critiques*; it is the axiomatic source of the referenced, fraudulent claims of Wiener *et al.* The recognition of this fact, that the crucial issue of this controversy was metaphor, was the present writer's starting-point for refuting Wiener *et al.*, circa 1948.

Let us look on the experience of those years with compassion for that reader who may be unfamiliar with some parts of this subject-matter. At the time, during the late 1940's, much labor was required to bring this writer to the conclusion reported here. In retrospect, it seems not so difficult, as a matter of principle, to recognize, that that quality of emotion experienced in successful concentration upon replicating a valid original discovery of principle in physical science, is identical with the quality of emotion underlying the experience of a successful Classical musical performance. Out of the same compassion for such readers, we may say, that the extension of this first conclusion, to show that this connection is extended to the domains of Classical tragedy, such as Aeschylus' and Shakespeare's works, and to Classical forms of poetry, also required considerable, if somewhat less additional effort, during the years the writer was working this out; in retrospect, that too, appears not so difficult, in principle.

In a similar sense, it was not so difficult, in principle, to show where the connection lay among these branches of science and art. Consider a student's rather typical reen-

actment (in any good school, or kindred setting) of the mental experience of an original discovery of principle.

Several features typical of such experiences, show us, that the prompting of this sort of discovery of principle, is exactly of the same quality as the role of true metaphor in Classical poetry, tragedy, and music. The German *lied*, from Wolfgang Mozart's "Das Veilchen" onward, is a most convenient illustration of the intersection of poetic and musical metaphor on this account.¹⁹ In all these types of musical and other cases, the term "metaphor" has a single, consistent functional significance.

Respecting any discovery of a scientific principle, metaphor confronted the person effecting that discovery (whether as an original discoverer, or a student in a properly run educational program), with a seemingly impossible irony. On the one side, the facts provoking the search for the discovery, were more than persuasive; yet, the only apparent conclusion to be drawn from that set of facts, is that what one had believed about nature (for example), and relied upon in a very practical sense, up to that point, was now shown to be substantially false.

In such cases, there is no *deductive*, e.g., *linear*, form of link between the challenged, pre-existing scientific belief, and the reality of the newly considered evidence. Both the evidence, and that which the evidence contradicts, are provably truthful reflections of the same level of development of the cognitive processes of that mind, the which senses itself obliged by reason to accept both contradictory claims. Yet, once the two contradictory claims are juxtaposed to one another, a seemingly impossible contradiction appears. There is no symbolic meaning here; it is something much more profound, and, unlike symbolism, altogether real.²⁰ There, in that specific quality of circumstance, that specific quality of irony, lies the

19. The credit for showing Mozart's "Das Veilchen" as a breakthrough in the application of motivic thorough-composition to song, was the joint work of several collaborators, notably prompted by the argument of Kathy Wolfe, the co-editor of Book I. Mozart's "Abendempfindung" is an exquisite example of the same principle; his *Ave Verum Corpus*, as noted elsewhere, embodies the principle in an advanced way, and to relative perfection.

20. For example, Hamlet's Act III, Scene I soliloquy: ". . . But that the dread of something after death,— / The undiscover'd country, from whose bourn / No traveller returns—puzzles the will, / And makes us rather bear those ills we have / Than fly to others that we know not of? / Thus conscience does make cowards of us all; / And thus the native hue of resolution / Is sicklied o'er with the pale cast of thought; / And enterprises of great pith and moment, / With this regard, their currents turn awry, / And lose the name of action." This soliloquy, set in the context provided by the closing soliloquy of the preceding act, expresses Shakespeare's central, *motivic* germ, upon which the derivation of the entirety of that play's composition depends. This is to be compared with Friedrich Schiller's notion of this principle of composition of tragedy. The apparently unbridgeable distinction between the

contending two, each ostensibly truthful principles, exemplifies the absolute degree of irony on which the composition of great Classical tragedy pivots; the inability of the Hamlets, is the lack of will to muster that specific quality of emotion, through which breakthroughs to a new, higher, resolving order of comprehension, may be secured. That failure to force through an intellectual resolution of the conflict, through attaining a higher level of comprehension of the contradiction itself, is the defining, underlying subject-matter of all great Classical tragedy, from its root in the Homeric epics, through the compositions of Aeschylus, Shakespeare, and Schiller.

21. In bad reviews, great Classical musical compositions are degraded to products of symbolism. That is the vantage-point of the worst apologists for the Romantic school, and for the still more decadent effluvia produced in the course of the present century. In metaphor, there is no symbolism, a distinction which separates metaphor absolutely from certain less rigorous forms of irony. All metaphor represents a well-defined paradox; the most important metaphors, in science and in Classical art, present an ontological paradox. The essence of motivic thorough-composition, is of the form of ontological paradox.

Mozart's 'Das Veilchen'



Goethe's poems were part of a conceptual advance in poetry during the wave of optimism which swept Europe at the time of the American Revolution. They created new possibilities for musical composers—a fact to which Goethe's own self-involvement seems to have blinded him. Mozart, however, saw it clearly. He took "Das Veilchen," and created a musical work far beyond anything in the poem.

The poem is constructed in three strophes, which overall scheme itself contains a similar sonata-like form. Each strophe consists of two groups of three and four lines. The ends of these groups produce a rhyme across the first two strophes: "Veilchen . . . sang; Weilchen . . . lang," with similar poetic mood. The final strophe departs from this, with "Veilchen . . . doch" producing a distinct development.

Mozart saw in this poem the internal rates of development necessary to carry out an opera in microcosm, a new quality of *One* from the poem's *many* ironies. His use of voice registration was therefore much more complex. Mozart scanned the poem as a unit-conception from the ultimate singularity, the final verbal transformation: How does the violet die? Answer: "Durch sie, zu ihren Füßen." There he would require a strategic register shift.

The rising vowel-pitch vocalization of the repeated "Durch sie," /u/-/i/, /u/-/i/, indicated that the phrase rise to the desired register shift.

Once Mozart chose a soprano/tenor registration for the singer, G major was a clear candidate for the key of the song, because the line rises from the fifth D to the tonic G, in exactly four notes (D-E-F#-G) for the four measures needed for the phrases: "Und *sterb* ich denn, so *sterb* ich doch, / durch *sie*, durch *sie*." This key has a shift into the third register on the plaintive seventh degree of the

scale, creating a humorous irony on the first "durch sie," which then resolves to G when it is repeated. . . .

Mozart treats Goethe's three strophes by creating a musical *transfinite series*, an " $A \rightarrow B \rightarrow C$ transformation." In a musical transfinite, the opening thematic statement *A*, is followed by a development passage *B*, followed by a closing *C*, which is either a restatement of theme *A*, or something new. Between the passages *A*, *B*, and *C* there are singularities, one between *A* and *B*, and a second, of a different order, between *B* and *C*. Thus, *three* is the smallest number of distinct musical passages, which can define two distinct types of singularities. Such a *progressing quality of singularities* is one necessary condition of a transfinite series. The musician will recognize that the Classical *sonata form* is the usual musical term for such an " $A \rightarrow B \rightarrow C$ transformation."

Each *A*, *B*, *C* is the musical equivalent of a simple system, analogous to the simple mathematical system of axioms and postulates, which the "logical," Kantian observer assumes to be fixed. The creative composer, such as Mozart, delights in presenting such a musical idea *A*, only to take it apart or supersede it with new musical ideas *B*, and then *C*, in the same manner in which a scientist overturns what the Kantian assumes to be an axiomatic geometry, by performing a crucial experiment disproving a basic axiom. The succession of transformations so ordered, represents an indivisible *unit-process*.

Mozart has deliberately set up a transfinite principle of change from one strophe to the next, such that there is an *increasing density of singularities*. This, particularly in the keyboard voices, is something entirely new in music, with Mozart's *lieder* from 1785 on.

—from "A Manual On the Rudiments
of Tuning and Registration,"
Book I, Chapter 11

metaphor, just exactly as we encounter Classical metaphor in tragedy, poetry, and in Classical motivic thorough-composition.²¹

In each medium—science, poetry, tragedy, music—this relatively absolute degree of irony arises. In both cases, science and art, solution depends upon mustering a

special sort of passion, that which Plato and the Apostle Paul identify by the term *agapē*. It is this special quality of emotion, which is required to summon the individual mind's cognitive powers of discovery of a higher principle, and to sustain that summoned power of concentration, beyond the point in that problem-solving process, at

which a validatable form of discovered new principle has been generated.

Throughout the delimited, but nonetheless extensive history of this subject-matter, from the Vedic philology of Sanskrit's Panini, onward, and presumably also in the teachings of Confucius, the same clear distinction between the "sacred" (e.g., the Platonic Greek *agapē*) and "profane" (e.g., the Platonic Greek *eros*), which confront us in the New Testament's Gospel of St. John, and Epistles of St. Paul, may be adduced.

These emotions are, demonstrably, not of the same species. *Eros* is manifestly linear, and otherwise both fanatically *deductive* (e.g., Aristotelian), and *symbolic*, in the characteristic patterns of mental behavior with which it is associated. In words appropriate to the context of Wiener's and Von Neumann's dogmas, the ordering-principle which the Shakti-Shiva/Gaea-Python-Dionysos/Isis-Osiris syndrome of *eros* generates, is, like Hamlet's obsession-ridden, "Macho" rage, characteristically *entropic*, the characteristic expression of a stagnant, backward, or even degenerating form of culture. *Agapē* belongs to a higher realm; its characteristic, for reasons of evidence which are to be indicated in this introduction, is *anti-entropy*. This anti-entropic quality of *agapē*, is expressed as its unique function in producing those forms of insight, as an anti-entropic ordering-principle, whose typical action resolves the kind of absolute ironies identified immediately above. Upon this kind of demonstration, the rational comprehension of the principle of metaphor, in art and in science, depends absolutely.

It must be emphasized here, that the emotion of *agapē* is "two-dimensional." In the higher regions of that domain which Leibniz sometimes identified as *Analysis Situs*, where the power of *agapē* resides, it is, as the term "emotion" implies, an impulse. It is also an upward-directed impulse, in the sense of "upward" attributable to "anti-entropy." It is an impulse which orders the direction of Platonic, creative change in thought, an agency, function, conquering the contradictions of the present, by rising to a higher state of human thought and action.²²

This quality of "upward-directedness," is seen most readily in respect to those changes in mankind's relation to the universe, which are the result of scientific and technological progress. Once we have recognized the way in

which validated discoveries of physical principle are generated within the sovereign precincts of an individual's cognitive processes, and have recognized the essential role which the emotional impulse of *agapē* performs in that process, the doors to comprehension have been opened.

We can measure mankind's power over nature, in but one way: the increase of the human species' potential relative population-density, as this correlates positively with both improvement of the demographic characteristics of relevant entire populations, and with the relative increase of both physical output *per capita*, and with related increases of consumption of market-baskets composed of such physical output.²³ All increase in ranges of man's power over nature, so measured, is attributable to such discoveries of valid principles: whether as original discoveries, or as replications of such original discoveries, the latter as in the mind of an individual student. Thus, the manner in which the individual generates discovery of valid principles, is both the essential distinction of man from the beasts, and is the process, within the mind of each relevant individual person, through which this progress is generated.

From this, two leading questions are resolved, at least in first approximation.

First, that this emotional quality, termed *agapē*, is the distinctive essence of the human individual, the creative power which Moses' Book of Genesis identifies as man and woman made in the image of God, the qualities which the Latin of the Augustinian tradition names *imago dei* and *capax dei*.

Second, the fact that this same, distinctive quality of emotion is the Platonic principle of *change*, constituting the underlying ontological actuality of Classical forms of art, indicates a necessary feature of such forms of art, something essential to promoting that quality of the individual which is *imago dei*. Thus far, such considerations properly define the meaning of the term "progress," as applied to science, technology, Classical art-forms, and society in general.

To go much further than those important preliminary findings, as they were assembled during 1948-1951, as to go into the domain of science of physical economy, requires an additional effort. Thus, in 1952, a reexamination of Riemann's celebrated habilitation dissertation proved indispensable.²⁴

22. The "agency" referenced here, echoes implied solutions to the principle of ontological paradoxes set forth in Plato's *Parmenides*. Plato's *Timaeus* is of crucial relevance in this connection.

23. For an introduction to the notion of potential relative population-density, see Lyndon H. LaRouche, Jr., *So, You Wish To Learn All About Economics?*, 2nd ed. (Washington, D.C.: EIR News Service, 1995).

24. *Op. cit.*

For reasons which are made much clearer after mastery of relevant features within Riemann's leading contribution to physical science, all competent mathematics, and its internal contradictions, can be represented only in the language of geometry, not from what modern academic practice regards as an "algebraic" standpoint in method.²⁵ Riemann's habilitation dissertation, which addresses and solves the leading problems left over by all preceding geometricians, "from Euclid through Legendre,"²⁶ redefines all mathematics from the standpoint of a new conception of geometry, itself based in the rigorous practice of experimental, rather than mathematical physics. This is indispensable for solving both crucial issues of a science of physical economy, and also crucial for rendering transparent the elementary principles underlying, and driving Classical modes of motivic thorough-composition.

With that objective placed in view, now consider, the present writer's brief summation of those aspects of Riemann's discoveries which are crucial for the problem of science and music being addressed here. The writer has interpolated points here which he regards as implicit in Riemann's work, and which are indispensable for adequate comprehension of his work, but which are not explicitly elaborated in Riemann's dissertation.

"From Euclid through Legendre," geometry depended upon axiomatic assumptions accepted as if they were self-evident. On more careful inspection, it should be evident, that these assumptions are not necessarily true. Furthermore, the interrelationship among those axiomatic assumptions, is left entirely in obscurity. Most conspicuous, even today, generally accepted classroom mathematics relies upon the absurd doctrine, that extension in space and time proceeds in perfect continuity, with no possibility of interruption, even in the extremely small. Indeed, every effort to prove that assumption, such as the notorious tautological hoax concocted by the celebrated Leon-

hard Euler, was premised upon a geometry which presumed perfect continuity, axiomatically.²⁷ Similarly, the assumption that extension in space and time must be unbounded, was shown to have been arbitrary, and, in fact, false.

Riemann's argument, repeated in the concluding sentence of his dissertation, is, that, to arrive at a suitable design of geometry for physics, we must depart the realm of mathematics, for the realm of experimental physics. This is the key to solving the crucial problems of representation of both living processes, and all processes which, like physical economy and Classical musical composition, are defined by the higher processes of the individual human cognitive processes. Moreover, since living processes, and cognitive processes, are efficient modes of existence within the universe as a whole, there could be no universal physics whose fundamental laws were not coherent with that anti-entropic principle central to human cognition.

In retrospect, the crucial opening feature of Riemann's relevant discovery, is elegantly elementary. Given, an ontological paradox of the type indicated: an undeniable set of events implicitly overturns what appears to have been the equally undeniable experimental authority of a system of scientific thought which represented, up to that moment, the most advanced, most solidly established opinion. Two successive experimental steps must be taken.

First, the disturbing experimental phenomena must be validated, or the paradoxical implications refuted. This must be done experimentally. It must be done in the manner prescribed by the founder of modern science, Cardinal Nicolaus of Cusa; it must be accomplished through measurement. If it is validated, then what is demonstrated in this way, is a validated new principle of

25. The case of the consummate work establishing modern arithmetic, Carl F. Gauss' *Disquisitiones Arithmeticae*, is the proverbial exception which proves the rule. This is the entry into what Gauss identifies as "higher arithmetic," by means of creating, repeatedly, the type of contradictions, within arithmetic, which we have identified in the preceding paragraphs. The mind of the author of that most remarkable work, thinks in the language of higher geometry. Riemann's references to the precedents in Gauss, upon which he himself relied for developing higher, Riemannian geometries, underscore the approach which must be employed.

26. A.-M. Legendre, the author of the comprehensive work in geometry, composed as the basis for the mathematics education program of Gaspard Monge's famous *Ecole Polytechnique*. Legendre, the teacher of Riemann's sponsor, Lejeune Dirichlet, was, together with Gauss, a principal current leading into Riemann's revolutionary, 1854 habilitation dissertation.

27. Euler was a key figure among those Leibniz-haters imposed upon the Berlin Academy of Science by King Frederick "The Great" of Prussia. Together with his accomplice, Pierre-Louis Maupertuis, Euler participated as a leading figure in several hoaxes against the memory of Leibniz. One was the notorious "least action" hoax, in which Euler gave witting support to hoaxter Maupertuis, in a matter which led, subsequently, to Maupertuis' leaving Berlin in disgrace. Maupertuis, together with Giammaria Ortes, were the original authors of the "hedonistic calculus," whose development leads directly into the "systems analysis" hoaxes of John Von Neumann *et al.* The idea that a mathematics for physics could be premised adequately upon infinite series, was the product of a hoax concocted by Euler himself, in his attacks on the work of Leibniz posthumously published under the title *Monadology*. This Euler hoax led into the Nineteenth-century efforts, of Clausius, Maxwell, Hermite, *et al.*, to impose upon mathematical physics the arbitrary, false assumption, that physical relations could be represented adequately by functions of series, which assume linear extension, axiomatically, into the extremely small. Cf. B. Riemann, habilitation dissertation, on the matter of the extremely small.

science. However, by no stretch of imagination, does that resolve the issues. Existing physics, for example, must be purged of those definitions, axioms, and postulates which are discredited by this evidence. That is not yet sufficient; we must not simply add the newly validated principle to a cleaned-up version of the old physics. It is on the paradox which arises at precisely that latter point, that Riemann's genius shines through.

Second: The crucial question posed, bears upon a problematic issue we have mentioned above. The fallacy of preexisting geometry was not merely that some among the definitions, axioms, and postulates were of doubtful authority; the question of how the axioms might interrelate, was not properly addressed at all. This was the problem which Leibniz had referenced, in a preliminary way, under the rubric of *Analysis Situs*.²⁸

By definition, any experimentally validated principle of (for example) physics, can be regarded as a dimension of an "*n*-dimensional" physical-space-time geometry. This is necessary, since the principle was validated by measurement; that is to say, it was validated by measurement of *extension*. This includes experimentally grounded, axiomatic assumptions respecting space and time. The question posed, is: How do these "*n*" dimensions interrelate, to yield an effect which is characteristic of that physical space-time? It was Riemann's genius, to recognize in the experimental applications which Carl Gauss had made in applying his approach to bi-quadratic residues, to crucial measurements in astrophysics, geodesy, and geomagnetism, the key to crucial implications of the approach to a general theory of curved surfaces rooted in the generalization from such measurements.

The consequence of seeing those interconnections, calls forth recollection of Christiaan Huyghens' discovery of isochronicity in the gravitational field, and the, subsequent, combined outgrowths of the work of Ole Rømer, Huyghens, Leibniz, and Jean Bernouilli, in showing the coherence of this isochronicity in the gravitational field, with that same quality manifest in refraction of light propagated at a finite rate of retarded propagation.²⁹ Thus, the assumed, functionally efficient interrelationship among "*n* dimensions," could be reduced to a form of experimental validation through measurement of the "curvature" of the physical-space-time domain referenced.

28. *Op. cit.*

29. Christiaan Huyghens, *The Pendulum Clock*, trans. by Richard Blackwell (Ames, Iowa: Iowa State University Press, 1986). Jean Bernouilli, in David E. Smith, *A Source Book in Mathematics* (New York: Dover Publications, 1959), pp. 644-655. Poul Rasmussen, "Ole Rømer and the Discovery of the Speed of Light," *21st Century Science & Technology*, Spring 1993 (Vol. 6, No. 1).

The notions of extension in space and time, were fully subject to this same experimental method.

Hence, Riemann was the first to develop a truly "non-Euclidean" geometry. Other tactics, such as those which merely challenged the so-called "parallel postulate," are properly viewed as "neo-Euclidean," rather than "non-Euclidean," since they do not challenge directly the crucial, all-encompassing, axiomatic flaws of Euclidean geometry which we identified here.

What Art Must Learn From Euclid

The crucial distinction between that science and art which was developed by Classical Greece, as distinct from the work of the Greeks' Egyptian, anti-Mesopotamia, anti-Canaanite sponsors, is expressed most clearly by Plato's notion of *ideas*.³⁰ The possibility of modern science depends upon, the relatively perfected form of that Classical Greek notion of *ideas*, as that notion is defined by Plato. This is exemplified by Plato's Socratic method of hypothesis, upon which the possibility of Europe's development depended absolutely. What is passed down to modern times as Euclid's geometry, embodies a crucial kind of demonstration of that principle; Riemann's accomplishment was, thus, to have corrected the errors of Euclid, by the same Socratic method employed to produce a geometry which had been, up to Riemann's time, one of the great works of antiquity.

This, as we shall show, has crucial importance for rendering transparent the underlying principle of motivic thorough-composition.

30. Following the period of that Mediterranean "dark age" which bridges the end of the Second Millennium B.C. and the opening centuries of the First, Egypt emerged as the center of a kind of renaissance of civilization within the Mediterranean littoral and adjoining areas. Against Egypt's traditional enemies, Babylon and Canaanite Tyre, Egypt extended its sympathies to the Ionian Greeks, in the eastern Mediterranean, and to the Etruscans, in the western Mediterranean. This becomes visible to scholars for the period of the Eighth and Seventh centuries B.C. The crushing of Tyre and Babylon (Persian Empire) by Cyrenaica-allied Alexander the Great, is the predominantly happy, if imperfect outcome of this process. For the competent understanding of European civilization today, the crucial feature of superiority of the Classical Greek culture, is that centered in the work and heritage of Plato, in the notion of *ideas*. The hegemony of Classical Greek thought, and language-culture, in the eastern Mediterranean, following Alexander's conquests, is exemplified by the role of the Platonic Academy's great Eratosthenes, in Egypt, and Archimedes in *Magna Graecia*. The cultural superiority of these Greeks, over the Egyptian culture of that time, is centered in the development of the notion of the *idea* by Classical Greeks, Plato most notably.

Euclid's geometry itself becomes transparent, if we examine its characteristic, historical features from the vantage-point of Plato's Socratic method. Briefly, given a set of propositions, which appear, during that time, to have been proven, as in an Egyptian way, by construction. Enter a Socrates.

What are the implicitly underlying assumptions about space which may be shown to be common to this array of propositions? The result is an array of definitions, axioms, and postulates. It is recognized, under Socrates' leadership of the dialogue, that when we might attempt to show an equivalence among any of this collection of propositions, we are necessarily implying that we believe certain axiomatic assumptions, that we are proceeding from certain adducible assumptions, of an axiomatic quality, respecting the general nature of space, and also, implicitly, of time.

The ensuing step, then, is to define, as theorems, those propositions which are apparently proven by construction, and also deductively consistent with the adduced set of definitions, axioms, and postulates. This Socratic method in geometry, although it continues to be rooted in principles of construction, distinguishes between propositions which, respectively, are, and are not deductively consistent with the adduced, underlying set of definitions, axioms, and postulates. As distinct from the largely associative, irrational method of the Sophists, deduction is supplied a rigorous form through that development of geometry, which may be traced today from Pythagoras and Thales, through Plato and his Academy of Athens.³¹ In deductive geometry, those propositions which satisfy that requirement, are known as *theorems*.

The set of definitions, axioms, and postulates so situated, is exemplary of the most elementary of the literate uses of the term *hypothesis*. Specifically, this is a *deductive hypothesis*, as distinguished from higher forms, including *non-linear* hypotheses. Once the hypothesis underlying a known set of propositions is established, we may anticipate a larger number of propositions than those originally considered, which might also be consistent with that deductive hypothesis. The implicitly open-ended collection of theorems which might satisfy that latter requirement, may be named a *theorem-lattice*; such a theorem-lattice represents a *type* of propositions, the simplest form of a One solving paradoxes of that type represented by Plato's *Parmenides*.

The commonly underlying principle of organization internal to each such type of deductive lattice, is *extension*,

31. This development of deductive method to its highest level, by means of attacks upon the fallacies of the archetypical sophists of the Eleatic strain, is represented by the construction of the ontological paradox central to Plato's *Parmenides*.

as that principle is integral to the notion of measurement. This notion of extension, is the notion of a type of extension characteristic of the domain of the relevant choice of theorem-lattice.³² All scientific knowledge is premised upon matters pertaining to a generalized notion of extension. Hence, all rational thought, is intrinsically geometrical in character.

In first approximation, all deductively consistent systems may be described in terms of theorem-lattices. However, as we have considered crucial features of Riemann's discovery here, the essence of human knowledge is *change*, change of hypothesis, this in the sense in which the problem of ontological paradox is featured in Plato's *Parmenides*. In short, the characteristic of human knowledge, and existence, is not expressible in the mode of deductive mathematics, but, rather, must be expressed as *change*, from one hypothesis, to another. The standard for change, is to proceed from a relatively inferior, to superior hypothesis. The action of scientific-revolutionary change, from a relatively inferior, to relatively superior hypothesis, is the characteristic of human progress, human knowledge, and of the lawful composition of that universe, whose mastery mankind expresses through increases in potential relative population-density of our species.

The process of revolutionary change occurs only through the medium of metaphor, as the relevant principle of contradiction has been stated, above. Just as Euclid was necessary, that the work of descriptive geometry by Gaspard Monge *et al.*, the work of Gauss, and so forth, might make Riemann's overturning Euclid feasible, so all human progress, all human knowledge is premised upon that form of revolutionary change which appears as the *agapic* quality of solution to an ontological paradox.³³

32. Inverted, that becomes a reflection of Leibniz's notion of *necessary and sufficient reason*: the hypothesis which coincides with the characteristic form of extension of the domain in which the relevant occurrences are situated.

33. In no way, does this fact justify the fatalism of those sundry, gnostic doctrines of history peddled by the notorious G.W.F. Hegel, the irrationalist dogmas of neo-Kantian K. Friedrich Savigny, or the "objective," deterministic "theories of history" of the Social Democrats *et al.* The history of the human species is based upon a voluntary principle: one may do anything it is physically possible for one to do, and the universe may react even more freely in its response. The "dark ages" in human existence, for example, do not occur because of any inevitably cyclic character of history; each occurs because the relevant, extant culture has violated the principles of reason, either with such violence, or persistence, this to the effect, that the continued existence of the human species requires that mankind be purged of that offensive, or simply degenerate culture. The order of ideas to which we refer here, the epistemological ordering, is the resource from which men, women, and societies, select, or evade, voluntarily, those choices of behavior which determine the pathways history will follow.

Mozart's String Quartet K. 464

In response to Haydn's Opus 33, Mozart, over the next few years, composed six string quartets which integrated Haydn's development of the *Motivführung*, with J.S. Bach's discovery and elaboration of the properties of the major/minor mode. Mozart dedicated these six quartets to Haydn. Of particular interest is the string quartet K. 464 in A major, for it is known that Beethoven studied this quartet closely.

Here Mozart increases the density of change by generating the composition from a more condensed motivic idea. Notice the way Mozart constructs the initial idea such that a seemingly simple, two-measure idea has embedded within it a fundamental paradox. In measure 1, the quartet begins with a simultaneous division of the octave into a major third and a perfect fifth (A-A-C#-E). In the last half of the second beat of measure 1, the first violin descends one half-step to a D#, while the other instruments hold their original notes. The listener is presented with the singularity of the Lydian interval when he hears this half-step change from E to D# in relation to the A's of the 'cello and viola. Now the violin, playing alone, ascends up a minor third to F#, taking it across the soprano's register shift between F and F#. Then it descends step-wise a fourth to C# (playing a D-natural in contrast to the previous D#). Then it ascends again a minor third to the E on which it started, and then it descends step-wise a fifth to an A, where it is joined by the other instruments which, when combined, play the same notes as those on which the piece began, except, significantly, in a different order (C#-E-E-A). This time the E is doubled instead of the A.

From measure 3 to measure 4, all four instruments play simultaneous quarter notes. To summa-

rize, both the viola and the second violin start on the same note (E) and end on the same note (B), but an octave apart. Thus, the second violin ascends a fifth, while the viola descends the complement, a fourth. The first violin then ascends step-wise a fourth (A-B-C#-D). In addition, the second violin also plays the same E with each note. Even though this E doesn't change its pitch, it is heard differently every time it is played, *because everything around it changes*.

A new Lydian interval, G#-D, is formed on the second beat of measure 3, between the viola and second violin, and on the first beat of measure 4, between the 'cello and the first violin.

All instruments rest on the second beat of measure 4, directing the listener to bind what has just been heard, into a *One*.

Look at the types and density of audible singularities which are presented in these first four measures. For example, the Lydian interval in measure 1; the changes in registration in measures 1 and 2; the difference between ascending and descending intervals, and the complementarity of the fourth and the fifth, in measures 3 and 4. All these singularities are embedded in what Mozart has organized into a seemingly simple idea, which the listener then re-creates in his mind as a thought-object which itself is "unheard."

From the last beat of measure 4 to the first beat of measure 7, the quartet subjects what has just been heard to a transformation which produces a significant difference in the behavior of the singularities previously generated. . . .

—Bruce Director,
from "What Mathematics Can Learn
from Classical Music"

Fidelio, Winter 1994 (Vol. III, No. 4)

The pervasive characteristic function among all of those forms of art which meet the standard of Classical art-forms, is to celebrate those qualities of cognition by means of which such metaphors are posed, and their valid resolutions accomplished. Such exemplary paintings as Leonardo da Vinci's "Virgin of the Grotto," and Raphael's "School of Athens" and "Transfiguration," typify the role of metaphor. From the Classical Greek sculpture, the life-like effect of an image, such as the work of a Scopas, as if caught in mid-motion, as contrasted with the tripod-like sterility of archaic Greek and Egyptian statuary, also typifies the role of metaphorical qualities of irony in the plastic media.

Platonic *ideas* are defined, with respect to his view of geometry, in the following ways. Musical ideas are a special type of such Platonic ideas.

We have seen how a Platonic idea, known as an hypothesis (in this instance, a deductive hypothesis), subsumes an open-ended collection of ideas, known as theorems. We have addressed the fact, that there are successions of many individual hypotheses, which are subsumed, as a succession, through metaphor. That is, by those discovered principles which oblige us to change not only the axioms of existing hypotheses, but to develop an experimentally validated replacement for that hypothesis, a replacement which reflects the interrelationship among the new array of axioms.

Successive such, metaphor-driven changes in hypothesis, imply a principle of *change* common to these successions: a common characteristic of each and all among those successive *changes of hypothesis*. Our attention here, is focussed, emphatically, upon sequences of hypotheses whose ordering is characteristically anti-entropic, hence, epistemologically *agapic*. In Plato, such orderings fall within the domain of *higher hypothesis*, or, of *hypothesizing the higher hypothesis*; both latter define the domain which Leibniz referenced by use of the term *Analysis Situs*.

The dispute within Plato's *Parmenides*, prefigures today's commonplace experience, that such ideas might be mislabelled by persons who are less than fully literate, as "abstract ideas," or, by the deprecatory "only abstract ideas." In such cases, we have encountered either an empiricist, a radical positivist, a materialist, or something akin to that: a person who is obsessed with the delusion, that only those ideas whose existence is attributable to sense-certainty, are real, and that so-called "abstract ideas" are merely fictional.

In fact, all of those ideas which are essential to mankind's increased mastery of nature, fall into the category of this semi-literate person's definition of "abstract ideas." Nothing other than such ideas, is the distinction between living and non-living processes; or, between

merely living processes, and those living processes which are also characterized by cognition; or, between the relations which we might think are directly observable by means of our senses, and those relations which must be inferred by the methods of astrophysics, or of microphysics.³⁴

Such an overview of Euclidean geometry, as viewed from the vantage-point of Riemann's correction, is the minimal vantage-point from which the principle of motivic thorough-composition can be rendered truly transparent. The argument in support of this, leads to the concept toward which this introductory presentation is aimed. Look backward, at Euclid's geometry, as we have outlined the case here, from the vantage-point of Riemann, as stated here earlier.

What we have described, for the case of both Euclid and Riemann, is fairly described as a representation of the way in which the human mind works, using "work" here in the sense of productive labor. In this case, we signify that cognitive labor which impels mankind from a lesser, toward a higher quality of potential relative population-density. Did the human mind work in that same way, before the revolution effected by Classical Greek civilization?

It certainly did work in that way: the principle of the individual human cognitive processes' design, remained the same. Successful cultural revolutions represent an enrichment of that development of the process built upon that constant principle. Or, to put the same point in a slightly different way: The progress, from relatively lower, to higher states of cognitive development of the individual's cognitive process, expresses a characteristic of the human species, nothing less than the difference between man and beast. That characteristic is expressed by all known human existence, as the willful increase in man's *per-capita* power over nature, through the kinds of revolutions in thought, and thought-driven development of

34. As stated in other locations, a formal *Analysis Situs* must be organized on the basis of a nine-celled array, constructed as follows. The subject-matter of human knowledge as such, appears to be organized as sets or relations among the elements of a three-by-three table. We must assort the evidence among three domains: astrophysical, microphysical, and macrophysical; we must assort processes among three types: ostensibly non-living, living but not cognitive, and cognitive. All possible permutations of those nine cells exist; all possible permutations are subsumed by a general principle. The principled topic of such an array is the characteristic ordering found within and among the cells, for which the distinction between entropic and anti-entropic orderings is paradigmatic. See, Lyndon H. LaRouche, Jr., "The Essential Role of 'Time-Reversal' in Mathematical Economics," *Executive Intelligence Review*, Oct. 11, 1996 (Vol. 23, No. 41); this also appeared in *Fidelio*, Winter 1996 (Vol. V, No. 4).

principles of practice, which we have identified here by reference to Riemann's revolution in geometry.

The same point, expressed otherwise, is, that every development of the human mind, in this epistemological sense, was always potentially there. The principle of development was always there. In every step of human cultural ascent from the relative bestiality of more primitive culture, the change occurred as an increase of mankind's knowledge of the implications of that principle of discovery inhering in all persons. In effect, every such upward step, represented man's increased knowledge of that principle itself. This is the principled characteristic of man's dominion in the universe, that, when mankind employs this principle, on that account, and in that way, the universe is obliged to make the relevant submission to man's will.

Look, then, at geometry, again. Look at Euclid's geometry of space-time, as the necessary predecessor of its supersessor, the latter the Riemannian geometry of physical space-time. Focus upon the role of metaphor, as we have considered this, above, in three structured contexts: from the standpoint of a Socratic view of the origins and development of a Euclidean geometry; from the standpoint of a Riemannian geometry; and, from the standpoint of what we have identified, summarily, above, as the transition from the Euclidean to the Riemannian world-outlook.

It is by developing a rigorous structure for ideas, through the method of hypothesis, that we are able to construct designs of measurement which correspond to the difference, between the old hypothesis, and the apparent anomaly which threatens to overthrow the credibility of the presently established hypothesis. The step which distinguishes a discovery from what might be a mere fantasy, is the proponent's devotion to addressing the question, "How might this be proven?" It is by thinking in terms of the principle underlying the notion of measurement, which we should recognize, interchangeably, as *extension* or *dimension*, that we are able to mobilize the cognitive powers of mind in the manner required to solve the ontological paradox so posed. The implied question then becomes: Is the geometrical form for posing and resolving metaphors real, or merely a convenient fiction?

Radical positivist Ernst Mach, or Bertrand Russell, and such among their followers as Norbert Wiener and John Von Neumann, would be obliged to recommend the latter, false assumption.

The same question of principle may be expressed for music: Are the constructions associated with Classical musical composition, notably motivic thorough-compositional forms, real, or are they merely fictions, in the sense

of such functionally related, irrationalist dogmas, as Immanuel Kant's doctrine for aesthetics,³⁵ Friedrich Savigny's Romantic theory of law, with its *Volksgeist* doctrine,³⁶ or U.S. Associate Justice Scalia's irrational notion of historical, democratic specificity in law, as ephemera of current taste?³⁷

Respecting music as such, views akin to those of Kant, Savigny, and Scalia, are rampant today, in the U.S.A., and elsewhere. One may read in program notes, and, unfortunately, also hear, in some performances, the false presumption, that Johannes Brahms was a "Romantic" composer. This policy had been adopted, either by some credulous writer, who had heard that opinion expressed, or by some performing artist, who had deformed his, or her practice, by adopting the popularized hoax, that the spirit of music had moved, from approximately the time of the 1814-1815 Congress of Vienna, away from the Classical, toward the Romantic style. Romanticism is Kant; it is also the cultural doctrine of Hitler forerunner Savigny; and, of almost any ranting demagogue who insists that the turn-out of a wild-eyed mob for even the most debased entertainments, was someone's "our culture," as mandated by the reign of some new "spirit of the age."³⁸

Is there a principle of truth, as in honest science, which ought to be recognized as underlying, in the sense of a ruling conception, the composition and performance of a work of art? Or, in the alternative, might we be obliged to tolerate today's popular proposition, that that the ever-antic *Zeitgeist* might have commanded artistic taste to degenerate, from the Classical standard represented by a Homer, Aeschylus, Raphael, Bach, Mozart, or Beethoven, to the level of that robust sincerity of populist sentiment, which inspires the legendary barroom brawl?

Is it not, rather, the case, that the architecture of natur-

35. As referenced earlier, Immanuel Kant, *Critique of Judgment* (1790).

36. By no accident, Savigny's *Volksgeist* doctrine laid the foundations for legalizing the "Nuremberg rally" form of populist dictatorship represented by Adolf Hitler's regime in Germany. Every effort to substitute the ever-capricious popular will (real or fictional), for a principle of law which defends the individual right against the popular will to violate that right, tends toward the worst forms of tyranny. A tyranny based upon that principle of capriciousness which, once it had seized the popular whim, then moved onward and upward, as in the procession of Ancient Rome, through the Civil Wars of the Republic, to its more perfect incarnation of populist irrationalism, as the imperial *Pontifex Maximus* of a Tiberius, Nero, and Caligula.

37. On Scalia *et al.*, see, Lyndon H. LaRouche, Jr., "The U.S. Constitution's New Life," *Executive Intelligence Review*, March 14, 1997 (Vol. 24, No. 12).

38. In the relevant dogmas of Nineteenth-century German Romanticism, the terms are *Volksgeist* or *Zeitgeist*.

al polyphony, and of the domain of tonality, functions in music as geometry functions in the domain of physical science? Is it not the case, that the human mind, over millennia of development of civilized life, has discovered, in geometry, a natural expression of the way in which the human mind is organized, to the effect of generating, and elaborating those discoveries upon which mankind's increased mastery of nature depends? Is it not the case, that that long process of man's development of music, leading through J.S. Bach's development of well-tempered polyphony, the which made possible, directly, Wolfgang Mozart's discovery of his principle of motivic thorough-composition, is nothing but the process of uncovering, phase by phase, not only a less imperfect comprehension of the natural predisposition of the human singing voice, but also the way in which music might, less imperfectly, evoke that emotion of *agapē* which is the innermost, underlying quality, expressing man's nature, as Plato, and the Apostle Paul understood this?

The case for geometry establishes the basis for making the case for art in general, and music as such. Continue with the argument for the case of geometry, and, thereafter, apply it to those aspects of the subject of motivic thorough-composition, which we identified at the outset of this introduction.

Physical-Economy and Epistemology

At this point, let us agree to employ the term "efficient ideas," to identify either principles, or hypotheses, validated by the methods of experimental physics indicated above, or to identify those kinds of theorem-like notions whose authority is derived from validated principles, validated hypotheses. The function of that proposed usage, may be conveyed by a question: "If certain ideas, regarded by some persons as 'merely abstract ideas,' have the practical effect of increasing mankind's effective power over the universe, are those ideas not 'real,' rather than mere fictions?" That question has approximately the same significance, as the question with which, nearly six decades ago, the present writer, like some similarly egregious adolescents, amused himself, by asking the teacher in the natural-science class, "Has biology any prospect for discovering principles which would permit the existence of a form of life capable of teaching biology?"

We, the human species, do not merely adapt to the universe, in the manner animal ecology projects a lower species' adaptation. Mankind intervenes in the universe, to change its state, willfully, to one of a higher ecological

potential. In the case, that this willful change produces an intended increase in the potential relative population-density of the human species—as modern European civilization's five-hundred-year influence has so increased that of this planet, does not this demonstrate that the process of anti-entropic change of hypothesis has access to an efficient principle? To follow Leibniz: Does not man's existence, thus, show, that we must include human cognition as integral to the "necessary and sufficient reason" for the increase of mankind's potential relative population-density?

If a composer of music intentionally evokes *agapē*, using one method, and a different method evokes banal eroticism, instead of *agapē*, have we not been presented, thus, another case of the efficiency of the principle of "necessary and sufficient reason"?

The fact that qualitative human progress occurs in a manner identified, as to form, by Riemann's referenced, 1854 habilitation dissertation, demonstrates, by this notion of "efficient ideas," that that structure of the thinking-process, in which metaphor is posed and conquered, is no less than the shadow of something very efficient, something whose result can be attained in no different way. To restate this pivotal point of epistemology: We can not separate the efficient results of discovery in science or in Classical art-forms, from the discovery of the method, or from the *form* of the method, by means of which such discoveries are ordered.

Such was the source of the fascination with which these subject-matters gripped the present writer, nearly a half-century ago, in exploring the efficient connection between these issues of epistemology, and physical economy as the great experiment required to validate the solutions proposed from this epistemological vantage-point. Not only is the rate of effective investment in scientific and technological progress, the principal determinant of the rate of improvement of the conditions of life of populations; but, the success of such physical-economic increase of society's potential relative population-density, is the ultimate proof of physical science, and, also, of what is correct in music.

In sundry locations, the present writer, writing in his interdependent capacities as an economist, historian, and statesman, has presented, from this same standpoint, the efficient connection among certain forms of education, and of investment in scientific and technological progress, to the increase of the productive powers of members of the labor-force. He has pointed to the evidence, that educational programs of various nations, since France of King Louis XI, as these programs converge upon the standard for the Schiller-Humboldt designs of Nineteenth-century Classical-humanist education in

Germany, are indispensable for fostering the best performance of that section of the economy where science is transformed into applicable designs of machine-tool principles. Through such educational policies, the population employing relatively rapid advances in technology, is able to assimilate these designs efficiently, as this latter quality is expressed by improved qualities of product and of productive processes.³⁹ Focus upon the role of that form of education.

The Classical-humanist education focusses upon obliging the student to come to know the most significant principles of art and science from the past, through no different process than reenacting the original act of discovery, in the privacy of the student's own sovereign cognitive processes. Such a fortunate student knows what he, or she has learned, unlike the unfortunate victims of the general educational practices prevailing in today's primary, secondary, and higher levels. In other words, in the type of education for which the Schiller-Humboldt Classical-humanist program is a model, the student comes to *know* art and science, rather than merely learn to appear to know them. This knowledge is secured in the only possible way, through the process we have identified as metaphor.

It is not, and could not have been accidental, that the emergence of that crippled personality-type, associated with what has been termed, variously, the "Me" or "Now" generation, coincides with the sudden collapse of musical culture in Europe and the Americas, during precisely the period that generation was emerging as graduates from secondary schools and universities. There is a connection between the loss of musicality this reflects, and the fact that the predominant, trend-setting hustlers, at the top of day-to-day financial-market operations, lack any evident sense of the way in which they are blindly, fanatically repeating the worst follies in financial-market practice, those which have immediately preceded each and all of the worst financial speculative collapses, since the collapse of the Dutch tulip-bulb craze of Europe's Seventeenth century.

In today's U.S. schools and universities, one may rise to the top of one's class virtually unencumbered by knowledge of history. History is not taught, not even as poorly as it was featured in the secondary curriculum as recently as the mid-1960's. The entirety of today's politically-correct forms of secondary and higher education, is organized in such a way as virtually to destroy the capaci-

ty for knowing history among the graduates. What passes for a standard of historiography, today, is the standard set by Hollywood pseudo-historical fiction, or by wildly tendentious, purportedly non-fictional, film documentaries in the tradition of Nuremberg Nazi psycho-drama's Leni Riefenstahl, and the convergent existentialist currents of Communist Georg Lukacs, Nazi Martin Heidegger, Heidegger's Hannah Arendt, *Steppenwolf's* Hermann Hesse, leftist Bertolt Brecht, Theodor Adorno, and Jean-Paul Sartre. The standard of popular ideas about history, among today's university graduates, and the leading mass media, is that set by and for Hollywood's Goldwyn and Mayer, with the circulation of both the original, pro-Ku Klux Klan feature film, *The Birth of a Nation*, and, by its sequel, *Gone With The Wind*.

The functional significance of this recent three decades' moral degeneration in mass culture, is, that the external history of man as a species, the history of cultures and nations, is the internal history of the generation of ideas. The person who does not know the history of events, from a valid basis in study of the history of *generation* of valid ideas, is like the teacher of biology referenced above: unable to find a necessary and sufficient reason for his, or her own professional existence. The young person, and adult, may come to know history, not by learning to regurgitate opinions acquired from some textbook or related gossip, but, only by viewing history from the standpoint of the internal history of the generation of valid, and contrary ideas. Knowledge of the internal history of ideas, relies absolutely upon that *method* of metaphor, Plato's *method of hypothesis*, on which we have placed the emphasis here.

We have returned, thus, to the dialogue among Socrates, Thrasyachus, and Glaucon, in Book II of Plato's *Republic*; we have returned to the subject of *agapē*. The role of *agapē* as the actor which *generates* the commitment to justice (and, therefore, which *generates* truthful knowledge), is accounted for by the manner it appears in recognizing, and generating solutions for well-defined paradoxes of metaphor. Hence, the Apostle Paul's celebrated I Corinthians 13; within the passion which compels the actor, such as the Good Samaritan, to serve truth, and therefore justice, lies the merit in the actor.⁴⁰ It was the lack of precisely this disposition for engaging, and conquering metaphor, the lack of efficient mustering of *agapē*, which foredoomed Shakespeare's Hamlet, and the which might doom the United States of America, and global civilization, too, during the descending avalanche

39. Lyndon H. LaRouche, Jr., "The Essential Role of 'Time-Reversal' in Mathematical Economics," *loc. cit.*, and "Return to the Machine-Tool Principle," *Executive Intelligence Review*, Feb. 7, 1997 (Vol. 24. No. 7).

40. Thus: let it be said, of the pervasively corrupt present U.S. system of justice, that such judges shall be judged for, and by their own judgments.

of the ominous months ahead. The merit of everything, all knowledge, all practice, including all the good contributed to this planet in the course of spread and rise of modern European civilization, is located in the compelling passion called *agapē*, which employs the challenging paradox of metaphor, in science, in art, and in the practice of shaping human history.

The importance of that development of musical ideas, which leads, by way of the choir of Fifteenth-century Florence's Santa Maria del Fiore,⁴¹ through the well-tempered polyphony of Johann Sebastian Bach, into the Classical, polyphonic motivic thorough-composition of Haydn, Mozart, Beethoven, Brahms, *et al.*, is that this not only reflects the best part of the history of ideas, but celebrates that agapic idea of beauty in truth, which is the principle underlying every good facet of history, and pre-history. Such musical development, is also, therefore, a measure of truthfulness, as Plato's Socrates defends *agapē* as a generating principle of justice and, therefore, truth.

We know this, by making the extension of human existence, man, the measure of the universe. The construction of that measurement, in terms of those principles underlying a science of physical economy, prefigures an outline of the epistemological principles underlying the connection between J.S. Bach's relative perfection of well-tempered polyphony, and the form of Classical, polyphonic, motivic thorough-composition which emerged out of Wolfgang Mozart's discoveries of the early through middle 1780's.

The measurement of man's relationship to the universe as a whole, is that expressed as potential relative population-density. Most simply, this signifies what is identified by the present writer's introductory text.⁴² In a first, factually accurate, but potentially misleading approximation, the term "potential relative population-density," signifies, not only a function expressing increase (e.g., extension) of the number of persons which could be sustained, by means of a given level of technology, *per* square kilometer of some land-area of standardized quality of development. It also signifies correlated improve-

ments in demographic characteristics of households, and of the population considered as a whole. It also signifies an improved quality of individual life, as measurable not only in standard of consumption, but also in the composition of the qualities of activities of which the day, the week, the year, and a decade of individual and family life are, respectively, composed.

The system of inequalities expressing these comparisons is a fair description of what is to be measured. The requirements of a competent measurement are not so simple as that description might be read as presuming. We are faced thus with something usefully named "the horizon problem," a conception which is identical with the principle underlying Classical motivic thorough-composition.

The physical-economic behavior of man in society, is not of the sort which could be adequately assessed for value-judgment by assuming, that the typical individual's activities during a day or year, could provide a useful standard of measurement. Rather, we must assess the combination of the policies of practice, and conditions existing for the individual operative and household, as these affect the condition of, both every part of the society as a whole, and the society as a whole. This takes into account, not only those present conditions, but, more crucially, the future such conditions, to which the present direction in policies of practice would lead, if extrapolated, from presently existing conditions, into five, then, twenty, or more years ahead. We must not limit our consideration to other parts and the whole of the immediately contemporary period, but must judge the present by a well-defined notion of a future as determined by present trends, a future as implicit both in present conditions, and in present trends in policies of practice. That, is, broadly, the definition of "the horizon."

The role of physical-economic classes of "capital factors," is illustrative of the point. Current maintenance and improvements of basic economic infrastructure, are an example. The effect of today's education, and also quality of popular artistic culture, determine the relative potential of the coming generation of adults. Exemplary, is the emphasis upon fundamental scientific research, and investment, through such channels as the strategic machine-tool-design sector, in advanced technologies. Generally, we must view the combination of present circumstances, present habits, present conditions, present trends respecting changes in conditions, and, above all, the "cultural paradigm" as it, like an hypothesis, shapes, or strongly tends to shape, which branch leading from each future point of decision, the society were likely to prefer. This is, also, as we shall now emphasize, the underlying principle of Classical motivic thorough-composition, in music.

41. The high relief sculpture of singing children, in the choir of Florence's Santa Maria del Fiore Cathedral, is indelible evidence that the choir was the product of vocal training and singing in the mode known today as Florentine *bel canto*. Thus, with respect to the discovery of principle embodied in Brunelleschi's design and construction of the cupola of that cathedral, this sculpture attests to the fact that the 1439-1440 sessions of the great ecumenical Council at Florence, were, among other accomplishments, not only the setting for Nicolaus of Cusa's founding of modern science, and the shaping of what was to become the first, modern sovereign nation-state, that of France's Louis XI, but also a crucial bench-mark for the modern history of music, as of painting.

42. *Op. cit.*

In economics, the “horizon,” is the mirror of the present, when that present is viewed as it is reflected back upon itself, from its estimable future consequence, a capital-cycle, or longer, into the future. The question is never, to where have we come? It is, to where does this present journey lead us? This is not only economics; it is also the key to comprehending the historical meaning of a well-lived, individual human existence.

Physical-economy, employed in this way, lets history show us which impulses, and modes of thought, are in accord with the lawful composition of the universe. The “horizon” of our expectations, defines that greatest of all experiments, man’s success, through ever-increasing, truthful knowledge, in discovering, ever-less imperfectly, how mankind, with what restrictions, and to what purpose, might bend the universe to mankind’s will. In music, Classical motivic thorough-composition most emphatically, the same purpose is implicitly determining.

‘Time-Reversal’ In Classical Composition

In matters bearing directly upon those principles of composition of music, the which are situated beyond the mere enunciation of individual tones, all of the issues of composition, and of performance, are of a type which is identical with that represented by the ontological paradox of Plato’s *Parmenides*. This fact is key, for making transparent the principle underlying Furtwängler’s “performing from behind the notes.” The principle is identical, in form, and in principle, to that posed by the “horizon problem” of physical economy.

Given, a sequence of changes of state, in any kind of progress, musical composition included, is there a unifying principle which subsumes (i.e., underlies), as if simultaneously, each and every change of state within that composition? Conversely, could music be composed, this by the intention of the composer, in such a manner that every change of state (e.g., “transitions”) within the composition as a whole can be attributed to such a single, unifying, subsuming, underlying, simultaneous principle of ordering? In other words, could music be composed, and performed, in such a fashion, by use of such a method, that the entirety of a composition forms a perfect unity in the minds of composer, performer, and audience? Could a musical composition be, thus, the expression of but a single, subsuming, underlying conception? Can these connections be reflected adequately in a music manual, such as this present one?

Start the exploration of these questions, with the more

or less popular, classroom view of musical composition. Look at a typical, relatively simple composition from the standpoint of school-book harmony. Then, consider the more serious type of case, instances of Classical form of motivic thorough-composition. Could the answer to the array of questions just posed, be addressed, adequately, from that school-book standard? In the second type of case, it clearly can not be accomplished adequately; that shows, implicitly, that the method is implicitly flawed, even as applied to the first case. Overall, we are confronted by an ontological paradox of the sort referenced by Riemann’s 1854 habilitation dissertation.

For classroom, master-class, or related studies, begin with a selected type of cases among examples of Classical motivic thorough-composition. Begin with compositions, for one or a few performers, such as sonatas of two, three, or four movements, from the work of Wolfgang Mozart, Beethoven, Franz Schubert’s last years, and Johannes Brahms. Reference these from the vantage-point of J.S. Bach’s *A Musical Offering*, the “Six-Part Ricercare” most emphatically. Use Mozart’s K. 475 Fantasy as an exemplary derivation of a model for Classical motivic thorough-composition from this Bach work. Trace this particular choice of Mozart paradigm from such cases, through Beethoven’s Opus 111, and via a derivation located within measures 60-85 of the *Adagio Sostenuto* of Beethoven’s Opus 106, into Brahms’ Fourth Symphony. This provides the required span for our inquiry.

That specific study is summarized, later, within the text of this Manual. To get to the heart of the matter as directly as possible, look at this aspect of the internal history of Classical motivic thorough-composition from the standpoint of the “horizon” problem we identified for the case of economics. Mindy Pechenuk’s study of the role of the principle of “time-reversal” underlying Mozart’s composition of the referenced *Ave Verum Corpus*, is a case in point. Consider the matter, first, from the standpoint of performance.

The essence of musical performance is memory. Ramon Llull recognized this as the essence of music, as Plato before him defined this principle of memory. Examine this point, first, in terms of a restatement of the point of principle developed earlier in this introduction.

The distinction “Classical,” properly applied to any work of art, does refer, of course, to a principle first clearly manifest for art within the developments which the best features of Classical Greece contributed to all human civilization. However, in applying that term to any subject-matter which is not simply a replication of Classical Greek works of art, we are speaking not of Classical Greece as such, but, rather, of any expression of a certain specific type of principle. That latter usage of the term, “Classical,” is

Mozart's *Ave Verum Corpus*

Hypothesis E: “*in mortis examine.*”

Musical score for Hypothesis E: “*in mortis examine.*” The score is in G major (one sharp) and 4/4 time. It features four staves: Soprano (S), Alto (A), Tenor (T), and Bass (B). The lyrics are: in mor - tis ex - a - mi - ne. A box labeled “40” is positioned above the Soprano staff. A callout box labeled “Lydian interval” points to the interval between the notes G4 and A4 in the Alto staff.

Compare the very last phrase of the *Ave Verum Corpus*, sung on the words “in mortis examine,” with the very opening bars, sung on “Ave, ave.” Study, or listen to, these two sections enough, so that each forms a distinct image in your mind. Then, ask yourself, what governs the density of singularities in the “in mortis examine,” as compared to the opening “Ave, ave.” Do not perform this comparison “analytically,” but, rather, “synthetically”; what is crucial here, is the process that governed Mozart’s generation of ideas. You will discover that “in mortis examine” is transformed, in relation to the opening “Ave, ave”—it is related, and yet it is different. Ask yourself, what has changed, and, more importantly, *what has ordered that change?*

Clearly, there is a greater density of action, marked by a greater density of Lydian intervals. This change, is the crucial *characteristic* of the composition—a change which Helmholtz, Wagner, and the Romantics deny exists. That is, they would deny that Mozart has here made a deliberate and intelligible creative discovery. Instead, they would claim that, by some *unknowable* means, Mozart has managed to arrange the “in mortis examine” section as a particularly sensually pleasing

what we are employing here. For us, it applies to the tragedies of Shakespeare, or Friedrich Schiller, or the greatest paintings of Leonardo da Vinci and Raphael Sanzio, for example, or to well-tempered polyphony and the methods of motivic thorough-composition premised upon well-tempered polyphony. It were more likely that this principle were understood correctly, if we demand that the term “Classical” be heard as identical with the term “metaphor,” as the latter term has been defined above.

Hypothesis A: “*Ave, ave.*”

Musical score for Hypothesis A: “*Ave, ave.*” The score is in G major (one sharp) and 4/4 time. It features four staves: Soprano (S), Alto (A), Tenor (T), and Bass (B). The lyrics are: A - ve, a - ve ve - rum cor - pus, A - ve, a - ve ve - rum cor - pus, A - ve, a - ve ve - rum cor - pus, A - ve, a - ve ve - rum cor - pus. A box labeled “5” is positioned above the Soprano staff.

series of seventh chords and minor thirds—since, for them, the musical medium is reduced to a simple linear continuum.

The question before us, however, is: *What governs the shift which Mozart has made? . . .*

—Mindy Pechenuk,
from “Mozart’s *Ave Verum Corpus*”
Fidelio, Winter 1996 (Vol. V, No. 4)

That specified: consider “musical memory” as an expression of the process of memory of metaphor: the remembering of the process of defining and resolving each of a specific array of metaphors. In this case, remembering signifies experiencing each momentary step of each metaphor, from the standpoint of that conception of fore-knowing the “horizon,” which we have supplied here.

Compare this with knowledge of a valid scientific principle. As the point was argued earlier, here, one does

not know a principle, unless one can reenact the derivation of that principle from its appropriate root in paradox; this reenactment must occur within the sovereign privacy of one's own mind. Thus, the expression, "I know," should be restricted to the ability to validate the reenactment of the relevant, discovered principle, from its origins in a strict metaphor, through the validation of the solution to the deep paradox of that metaphor. That, in other words, signifies, we know only what we are able to validate through that kind of reenactment of a discovery, which we know as Plato's Socratic method.

Thus, we have "musical memory," as that term is employed here. Thus, the term "Classical" must be restricted to signifying "metaphor" in that sense. Every Classical work of art, music included, is a metaphor, from beginning through aftertaste. All competent performance of such musical compositions, is done from foreknowledge of the goal to be reached, from an initial statement of paradox, through to the concluding resolution. That which is defined by the announcement of the concluding tones of such music, is not some closing coda, but, rather, the pervasive principle of development which reveals itself in the manner it drives the performance of the composition from the question-mark with which the composition begins, to the close. It is the development under which this process is coherently subsumed, which is the idea of the composition, the "One" which eludes the Eleatics' paradoxes of Plato's *Parmenides*.

For the purposes of this introduction, what should be understood as the way in which the idea of a work of Classical motivic thorough-composition unfolds, is illustrated by stating that such development is of the *type* addressed in the referenced study of the *Ave Verum Corpus*. Thus, the immediate task left for our attention at this point in the introduction, is to point to the places, within the "micro-physical" aspect of well-tempered polyphony, in which the efficient principle of such development is found. What is the smallest among the possible expressions of metaphor, which is characteristic of a Bach well-tempered polyphony tuned at approximately A=430-432 cycles?

The answer is: *The principle of metaphor is located for, and within Classical well-tempered motivic thorough-composition, in a simple reversal ("inversion") of ordering of*

*tones of a single interval within a well-tempered polyphonic composition.*⁴³ This is located not only within a particular voice's part, but also occurs as sequences across the voices of well-tempered polyphony.

The essential role of well-tempered polyphony, is that, for the first time, the universality of such inversion was well-defined, and pervasive, as it could not be in any alternative mode of tuning. This tuning must be a product of, and integral to polyphony, since it can not be determined in any other way. Indeed, a Florentine *bel canto* mode of polyphony has a precise significance, in this respect. In the restatement of a line of poetry, by a second voice, the comparison of the locations of the register-shift in the first voice's expression of that line of poetry, with that in the second voice's, defines a most crucial point of reference for the composer. This principle of harmonic organization, is well defined only in terms of *bel canto* polyphony.

The precision with which this aspect of composition and performance is addressed, delimits the effects we might recognize by the terms "transparency" and "coherence."

The musician studying the implications of inversions within a *bel canto* polyphonic domain, will return to relevant Bach compositions, especially from among those of Bach's last years at Leipzig. The musician is well advised to begin his, or her tracing of Mozart's approach to motivic thorough-composition, by a period of concentration on the study of inversions in this specific domain.

The principle of metaphor supplies the proposed purpose for such review of that general phase of Bach's own development, of which the *A Musical Offering* is representative. To know the germ-principle of Classical motivic thorough-composition, it is essential to acquire a sense of the impact which Bach's work had upon Wolfgang Mozart, during those Sunday salons at Baron Gottfried van Swieten's Vienna residence, where Mozart first encountered the relevant collection of Bach manuscripts. It is necessary to relive, at least in that degree, Mozart's mastery of Bach's well-tempered polyphony, to comprehend not only Mozart's six Haydn quartets, the K. 475 Fantasy, but, most emphatically, such exemplary Mozart achievements in polyphony as his last three symphonies and his *Requiem*. As Mindy Pechenuk shows, all of the elements

43. Mozart's realization of this significance of the Lydian interval, is the crucial distinction of his K. 475, as compared with the K. 457 keyboard sonata to which he prefixed that Fantasy. The Lydian interval, as the most characteristic feature—the virtual "Pythagorean"—of the domain of well-tempered polyphony, is most commonly associated with the C-Major/C-minor modality of Bach's *A Musical Offering*. This bears upon the relevant register-shifts of the soprano and tenor voice-species. It appears to be a relatively commonplace error, to regard the appearance of

that interval there as a peculiarity of the C-Major/C-minor modality; in fact, the Lydian interval is a pervasive characteristic of well-tempered counterpoint, especially so with the appearance of the so-called "late Beethoven" compositions, his *Missa Solemnis* and his last string quartets most notably. As Mindy Pechenuk stresses, the role performed by the Lydian interval in the Mozart *Ave Verum Corpus*, both within voices, and intervals across voices, is a characteristic of the most agapic musical compositions.

of metaphor, and the relevant role of a general principle of *bel canto*, polyphonic inversions, are supplied a consummate expression in that gem, the *Ave Verum Corpus*.

After this work of Bach, everywhere in great Classical composition, the principle of well-tempered polyphonic inversion pervades perfectly. Perfectly, since all possible inversions are perfectly represented mathematically, by merely reversing the sequence in which the tones are uttered to form the relevant intervals.⁴⁴ Once the pervasiveness of such inversions, is set within the registral characteristics of voice-species, in *bel canto* polyphony, the values of a well-tempered scale, at C=256, and A=430-432, are determined *implicitly*.

To achieve that kind of internal perfection, a well-tempered tuning must meet the intersecting requirements, not only of perfected inversions, not only of the intersecting requirements determined by the natural registral distinctions among well-trained expressions of naturally determined singing-voice species, but must also add the weight of that vocalization of metaphor-dense forms of Classical poetry, whose singing is the root of music. All of these considerations, must be addressed within the domain of musical “time-reversal,” the domain in which the performance of each present interval is determined by its mirror-reflection in the idea which is the composition taken in its entirety.

This brings this introduction to the threshold of its concluding argument: on the subject of “time reversal” in Classical composition.⁴⁵ During 1995, and into 1996, the present writer grew impatient with the progress reached in preparing the second volume of this manual. The intent to build the presentation of the Classical com-

position’s palette, including the evolution of the instruments and ensembles around motivic thorough-composition, had already been established, and was progressing. By 1995, the chief hurdle to be overcome, was a pedagogical one. What was needed, was the selection of a handful of examples, selected for the advantages they might offer, in efforts to present principles to the reader with a minimum of diversion from that task itself. Central was the problem of selecting a single composition which embodied all of the principal types of features which Classical motivic thorough-composition represents. For the latter purpose, Mozart’s *Ave Verum Corpus* has since been chosen.

During this writer’s 1996 campaign for the Democratic Party’s U.S. Presidential nomination, he used the occasion of a Chicago campaign-stopover, to present the case of “time-reversal” to a group of associates there. There, in response to a question by Mindy Pechenuk, who had been among the key collaborators on Book I, the writer indicated that he was leaning toward the choice of the *Ave Verum Corpus* as the most compact and perfected exposition of the crucial principles of “time-reversal” in motivic thorough-composition. Her work, as presented later, removed any doubt of the merit of that selection. All the crucial principles are embedded in a transparent way in that small composition.

From Plato Through Brahms

It were not possible to attain an adequate comprehension of this method of composition, without reference to those notions of time which are located within Plato’s work.

44. Once again, the values of the well-tempered tones are not algebraically exact. They are singularities, each a small, but finite region of discontinuity within the extent of the octave-scale. The values are determined, not only by the fact that there must be the obvious coincidence of the tones among all scales; but, that each local interval must be performed, as Furtwängler’s referenced motto implies, from the standpoint of a musical memory of the composition as that unified process which is manifested as a completed process of continuous, coherent development, in the immediate “aftertaste” of its concluding tones. This must take into account avoidance of the “wolf-tone” potential in the vicinity of each register-shift, of each and all of the voice-species represented in well-tempered polyphony as a whole. The region of singularity, within which the enunciation of the well-tempered tone, may lie within the range defined by the application of each and all of the inversions imposed by the function of “time-reversal” in performing, according to that view of each interval as apprehended in the mirror of the perfected, whole composition being completed.

45. A few years back, baritone William Warfield demonstrated to a master class, the role of the principle of motivic thorough-composition’s applicability to the performance of a Negro Spiritual. This writer was not present during that class, but the Maestro recapitulated his presentation of the point during a later event, where the

writer was present, that same evening. The genius which sometimes appears in folk-song, as Antonin Dvořák demonstrated Johannes Brahms’ principle for the case of the American Negro Spiritual, is not accidental. The great compositions of a Bach, Mozart, Beethoven, and Brahms, are the outgrowths of a great, agapic yearning for such qualities of musical expression. The best performers, once they have mastered the most advanced products of Classical composition, are best equipped for recognizing the same yearning expressed in the noblest attempts of relatively less developed musical media and forms. In the sea of anonymity, in which the African-American slaves were as if buried alive, a cry reaches out to us, from across the generations, by means of Dvořák’s and Harry Burleigh’s grasp of the Negro Spiritual. One hears the beautiful yearning from the souls of those crushed bodies, cheating thus the satanic vigilance of the slave-master class. Those Spirituals remind us, that it was from similar kinds of social conditions, in ancient and medieval Europe, that the germ of the best Classical motivic thorough-composition also lived, and grew. See Dennis Speed, “The Classical War Against Multiculturalism: Brahms’ Compositional Method,” *Fidelio*, Winter 1993 (Vol. II, No. 4), pp. 50-57; also “African-American Spirituals and the Classical Setting of Strophic Poetry,” *Fidelio*, Winter 1994 (Vol. III, No. 4), pp. 23-36.

The relevant, summary argument, is as follows.

In the simplest case, a delimited sequence of events might be represented by theorems of a deductive hypothesis, as by a classroom Euclidean geometry. Although the sequence is, by definition, a form of extension in time, the hypothesis which underlines that sequence, does not change internally within the extension of time during which it underlies that sequence. Within those bounds, the set of definitions, axioms, and postulates, is an encompassing simultaneity. This illustrates the way in which the idea of “time” is situated within Plato’s work.

Next, consider a coherent sequence of successive hypotheses, none of which is deductively consistent with any among its predecessors. The principle underlying such a sequence lies within a higher domain, a domain corresponding to Leibniz’s use of *Analysis Situs*, and Plato’s “Higher Hypothesis.” As we have indicated earlier here, “higher hypothesis” references an ordering-principle which commonly underlies a coherent array of mutually inconsistent hypotheses. As in the first case, the sequence corresponds to extension in time. Relative to this sequence, the underlying ordering-principle is an “higher hypothesis,” which latter exists as an unchanged, but constantly efficient, encompassing simultaneity. An increase of Riemannian cardinality, as we have indicated that earlier, here, is an illustration of such an “higher hypothesis” as an ordering principle.

Similarly, higher hypothesis is subject to improve-

ment. This sequential process of improvement is subsumed by the notion of “hypothesizing the higher hypothesis.” The evidence, that hypothesizing the higher hypothesis leads mankind upward, toward greater *per-capita* power in the universe, requires an underlying, universal, changeless but efficient principle, under whose encompassing simultaneity the process of “hypothesizing the higher hypothesis” is given impetus and direction. That principle is Plato’s “Good.” The argument, so summarized, is the Platonic ontological proof of the existence of God. The quality which radiates from that Good, is *agapē*.

Hence, the Gospel of John; hence, the Apostle Paul’s I Corinthians 13. Hence, all men and women are made in the image of God, to exert dominion, as participants in the universe, by means of that quality, *agapē*, which casts them in such an image. Hence, the distinguishing principle of universality special to Christianity, that special principle which was belatedly given expression in those designs of statecraft flowing through the great ecumenical Fifteenth-century Council of Florence. Of this Renaissance, Bach and Classical motivic thorough-composition sing! So, each mortal human life may discover the meaning of each of its passing present moments, each mirrored, as in “time-reversal,” in the fact of a mortal composition taken in its wholeness. In the words of the motet: *in mortis examine*. There is the method of motivic, Classical, polyphonic thorough-composition.

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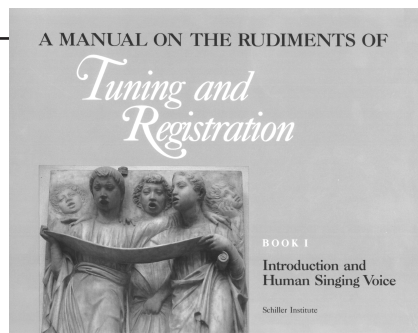
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