

## That Which Underlies Motivic Thorough-Composition

by Lyndon H. LaRouche, Jr.

August 8, 1995

[Published in *Executive Intelligence Review*, Volume 22, Number 35, September 1, 1995.  
[View PDF of original](#) at the LaRouche Library.]

[August 8, 1995—During several hours, on Sunday afternoon, July 30, five of us discussed the perspective on writing the crucial, thematic element of the *Music Manual's* Volume Two: *Motivic Thorough-Composition*: John and Renée Sigerson, Bruce Director, Dennis Speed, and I. This included an intense discussion of the philosophical basis which made *Motivführung* a necessary scientific discovery, for Haydn, Mozart, Beethoven, et al. This included emphasis upon the pedagogical challenges posed by the need to precede the presentation of motivic thorough-composition, by proof of the necessity of its being discovered: just as the natural construction of the human speaking/singing apparatus required the development of a well-tempered C=256 scale as a precondition for perfected polyphonic composition. For absent friends and collaborators, who should have participated, from Eisenach, Wiesbaden, and also that metropolis known to all as Elsewhere, this aide-memoire is produced.]

The proposition posed by Book II of *A Manual on Tuning and Registration*,<sup>1</sup> presents the editors of that book with the following pedagogical challenge.

Prompted by Josef Haydn's string quartet, Opus 33, No. 3, Wolfgang Mozart revolutionized musical composition, beginning the years 1782–86. This, Mozart accomplished by examining the discovery which Haydn expressed in the first movement of that quartet, in the light of the methods of polyphonic modality appearing, chiefly, in the work of J.S. Bach, notably the example of Bach's celebrated *A Musical Offering*. The result was Mozart's famous elaboration of an improved method of composition sometimes identified as *Motivführung*, which we identify generically as "motivic thorough-composition."

Later, as exemplified by his! late string quartets, Beethoven, during the last decade of his life, introduced a fundamental advance in Mozart's discovery, a richer modality in motivic thorough-composition. This method, its foundations so noted, dominated those great works of the Classical repertoire which were composed during the interval 1782–1897, from Mozart's discovery, to the death of Johannes Brahms.

---

<sup>1</sup> See *A Manual on the Rudiments of Tuning and Registration*, Book I, John Sigerson and Kathy Wolfe, eds., (Washington, D.C.: Schiller Institute, 1992).

The task of assembling Book II of that Music Manual obliges us to put these and closely related issues foremost, in the same sense that the historically determined discovery of the natural principles of well-tempered tuning, registration, and vibrato of the adult, *bel canto* singing voice, were put forward as the subsuming conception of Book I. That implicit obligation is described summarily, as follows.

From 1782 through the time of the deaths of Beethoven and Franz Schubert, saw the completed development of the crucial features of those forms of composition, and also of the performing instruments and their ensembles. Later, Brahms, most notably, enriched the development of those methods of motivic thorough-composition, but without altering the principles laid down by Beethoven. Although various developments of the construction and use of the instruments, both good and bad, were continued after 1828, today's most advanced principles of both Classical motivic thorough-composition, and the definition of the roles of the instruments and ensembles in performing such works, were fixed by the combined standards of Beethoven's *Missa Solemnis*, *Ninth Symphony*, and late string quartets. With such qualifications, it is accurate to say, that, by the time of Beethoven's death, the musical palette, and the contributing functions of its instruments and ensembles, were defined in approximately the same degree J.S. Bach's last years defined the principles of well-tempered polyphony.

The Manual is now proceeding toward completion of its original design, from the treatment of the singing voice, in Book I, into the treatment of the other instruments, in Book II. At this point, the governing principles of our effort are chiefly twofold. First, in both Books, the well-tempered tuning and registration of the human *bel canto* singing voice, is primary; the instruments and ensembles of the Classical palette remain, to this day, man-made extensions of the human individual's *bel canto* singing voice. Everything said in Book I, applies to the instrumental voices and ensembles of Book II. Second, the driving force in the reshaping of the requirements of the instruments and ensembles, from 1782 onward, is the changes in use of the ensemble, relative to the work of Carl Philip Emanuel Bach, for example, under the impact of the use of the new form of motivic thorough-composition wielded by such minds as Mozart, Haydn, and Beethoven. In short, to understand the instruments, one must situate the development of those instruments, and of their use, within that compositional setting which shaped their evolution.

This does not exclude consideration of relevant aspects of pre-1782, or post-1828 developments. Rather, the concentration upon 1782–1828 provides the historical benchmark of choice, from which to reference that which leads into 1782, and that which flows from it.

This evolutionary development of the instruments and ensembles could not be adequately represented without showing the new motivic method of composition, as the characteristic, determining feature of that process. Acknowledging that obligation, creates, in turn, an additional problem: a crucial problem of editorial, or, better said, pedagogical policy, a crucial issue of method.

In a precociously incautious impulse, one might presume that it were sufficient to present the principles of motivic thorough-composition, with suitable examples, as a matter of specialist education. That would be as if to say to the reader: “Learn the principles and techniques of motivic thorough-composition, and you will see how this new method of composition changed not only the method for composing Classical music, but the requirements of the instrumental performance.” For the *Brotgelehrten* of musical academia, that would be the acme of professionalism.

For us, such preciosity, such pedantic narrowness, such a fallacy of composition would be morally repulsive! In Book I, we fulfilled a moral obligation, to demand nothing from blind faith: We supplied the reader a *transparent* view of the necessary origins and development of well-tempered *bel canto* tuning and registration. The same must be done, in Book II, for the principles of motivic thorough-composition.

In Book I, we demonstrated that the *bel canto* principles of well-tempered singing-voice tuning and registration were a necessary development within music (and that Helmholtz and Ellis, and their devotees, were no more than charlatans).

Wilhelm Furtwängler in Berlin, 1930. He chided certain conductors, to learn to perform “between the notes.”

The same is true for *Motivführung*, and must be shown, similarly.

The difference between the respective endeavors of Books I and II, so compared, is that the principle of *Motivführung* goes directly to the most fundamental principles of the human mind. If that appears, at first encounter, as a frightening prospect, we might console ourselves in three ways. First, is it not fitting, that the second book of an educational series, should be more profound, and challenging conceptually, than the forerunner? Second, this writer and his relevant associates command readily identifiable, unquestionably unique, scientific competencies for addressing these underlying issues of composition. Third, we are at the point, that the mere process of continued ageing of the dwindling relative handful of musicians who know Classical principles, would relegate the literate reading of those musical scores to a lost art; this introductory task we must undertake, is a compelling one.

That noted, we now outline, step by step, the underlying principles of the human mind, upon which the necessity for motivic thorough-composition is premised.

### *The Curtain Rises*

The art of musical performance is premised upon the creative powers of human memory. The experience of every notable musician, might readily affirm at least that much of the matter which is set before you here.

The matter goes, far beyond such acknowledgments, to an empyreal realm, far above anything of which all but a few greats among musicians, thus far, have shown themselves aware. When Wilhelm Furtwängler chided certain conductors, to learn to perform “between the notes,” he demonstrated, that, even among leading conductors, there was an unmet need to master those most fundamental musical principles which are tucked away within the great art of memory, principles hidden by the speckled score, hidden “between the notes.” Furtwängler’s critics failed to comprehend, that he was pointing them toward functions residing within the domain of the power to remember. He was pointing them, not to a sensation, as a beastly melody might do, but rather to something exquisitely, beautifully human, an idea. In that instance, this signifies, as we do here: the essential quality of any musical idea.

Until one has uncovered, and developed those principles of musical memory, he or she might enjoy good musical composition and performance, but without understanding how to reproduce either at will, or why. Obviously, we could not be referring to so-called “rote memory.” What kind of memory, then? To answer that last question, travel within the realm of memory itself, to recall some stunningly beautiful musical performance. Recall an outstanding experience from among those memories. Or, perhaps, the musician who might be serving as the student’s teacher, would supply an appropriate demonstration of the principles we outline below.

Think back, in memory, to the moment the soloist appeared on stage. Block out from your recollection of that occasion, the sounds of applause, or kindred distractions; from the moment the soloist first appears before your eyes, hear nothing but the musical performance, until the last tone has vanished, into what is, for your memory of the event, a perfected auditory stillness. Perhaps, you have performed, either publicly, or alone with the music; if so, compare your recall of the soloist’s performance of the first composition of that occasion, with memory of your own experience alone with the music. Make these recollections the subject-matter of your conscious deliberation. Concentrate on seeking out the function which memory performs in those events.

Then, add a slightly different recollection. Not of a soloist, but a duet. Let us term this, a recollection of a second type. Recall an evening of Schubert Lieder performed by a gifted singer and pianist, or A masterful performance of a Mozart, Beethoven, or Brahms violin

sonata. As the reader will discover here, but a bit later, there is a compelling purpose in suggesting that you limit yourself, initially, to those three composers.

Next, recall a third type of musical event, a Mozart, Haydn, or Beethoven string quartet or quintet. At first, do not include Beethoven's late compositions. We might consider other composers, and other types of musical events; but, these three will be sufficient for the moment. As the first steps which we must walk in this direction, take these three types of musical events as a manifold. For the moment, register the fact that we are employing the term "manifold" in the sense common to both Bernhard Riemann's habilitation dissertation and the famous paradox of Plato's *Parmenides* dialogue. Adopt that musical manifold as the initial choice of subject-matter for our conscious attention; locate there, the functions of musical memory affecting the quality of the performance.

Later, we shall be prepared to move toward a higher objective: those principles of advanced motivic thorough-composition which are presented by Beethoven's late string quartets.

Now, let us merely describe the three, clearly distinguishable qualities of memory, which are guiding the musician performing on the stage of your memory. After those descriptions are supplied, turn to examine the concrete forms of the mental processes to which they correspond in the musician on stage.

Foremost, is the memory of the composition as an indivisible, continuing unit of conception, from the first to the last tone of its performance. To avoid a musical disaster on stage, this idea must remain constant, in the performer's mind, from a point prior to the performance of the first interval, until the perfected silence which follows the proper execution of the concluding tone. Second, there is a series of transitions, which define the evolutionary process of emergence of that indivisible conception, the which corresponds to the idea of the composition taken as a whole. Each of those transitions exists as an indivisible unit-idea; in the course of the performance, these intervals parade in their proper succession, as directed to do so by the controlling influence of the unit-idea of the composition as an entirety. Third, there is the idea of the process of development, linking each transition to its predecessor. Each moment of the development between transitions, is governed, twofoldly, by the idea of the transition, and under the governance of the unit-idea. If this rule is violated, musical coherence of the performance will not be achieved.

These three forms of mental processes are not merely descriptive, not merely pedagogical conveniences. Their definitions leap out at us from the performance, once we concentrate our attention upon the fact, that each of these three classes of ideas, which are controlling the performance, are recalled from memory, and are each products of memory. Once the answer is shown, we see, that, as in all truly rigorous scientific work: Up to that point of discovery,

the solution to the riddle was being hidden from us by the obvious. Examine the function of these three kinds of ideas of memory.

In summary: What is the most crucial single fact which stands out for a modern Socrates, as we examine your recollection of the soloist's performance you have chosen, as we examine that from the vantage-point we have now described? The crucial fact is this. In order to conduct a coherent performance, which expresses the entire composition with singleness of effect, the soloist must have in view, from the beginning, the cumulative effect, the musical idea, to be reached with the final note.

Implicitly, what we have just said, obliges us to examine this matter of memory on a time-scale. We discover, immediately, that there is something essential in the influence of the musical idea upon the performance, the which can not be explained as an attributed epiphenomenon of the tone's sensation. There is a contradiction, a devastating paradox, which can be, and is heard as a musical idea, an idea which can not be attributed to the senses as such.

That devastating paradox is situated thus: See how the idea of the performance as an entirety, shapes the performance of the intervals addressed! within each moment of the performance. We are confronted immediately with the existence of two musical ideas, both representing the composition taken as an entirety.

One of these two is efficiently superior to the other. The first of these two, is the performer's earlier grasp of the perfected idea of the composition as a finished whole; that is the idea which should never change in the musician's mind during the execution of the performance. This idea, the musician brings to the performance from an earlier, relatively perfected experience of the composition's completed performance.

The second idea, also pertaining to the composition as an entirety, is the notion of the incompleted idea of the same whole, in process of emergence, not yet *re-perfected*: at each point mid-performance. The same principle governs not only the performance, and the practice leading to the performance of that composition; it is also the experience of the hearer.

The first must control the second. The tension between these two, axiomatically distinct qualities of idea of the composition as a whole, is readily recognized as the motivating "tension," that sense of "suspension," which supplies a quality of psychic intensity, which is to be perceived as the "energy" of the successful performance.

It is in this way, that each hearing affects one's conception of the perfected (completed) composition as an entirety. Each new hearing, or each new treatment of the performance of the work, in public or in private practice, affects the conception of the composition as a

completed entirety. Each modification of the idea of the work as a perfected entirety (the first type of idea), affects the tension between that idea and the idea associated with the unfolding of the composition at each instant of mid-performance.

Thus, the paradox is situated. The unfolding of the second type of idea, the idea of the composition in the process of becoming, proceeds in a forward sense of time, from the first interval of the composition to the concluding tone. The idea of the composition as a completed entirety, the first type of idea, is represented as its impact of the completed performance upon the incompleting performance, upon the process of reproducing the performance yet to be completed. The first idea stands, thus, as representing a reversed ordering in time, in contrast to the naive sense-perception of the performance.

Contrast to this the viewpoint of the naive observer. He would tend to the proposition, that at any point in mid-performance, the idea of the composition in progress is based upon the “non-teleological,” cumulative effect of what has been presented up to that relative point of time in the performance. In fact, at every point of a competent performance, it is the future (the idea of the work as a completed entirety), rather than the events of the relative past, which exerts the dominant influence on the manner in which each performed interval must be shaped.

That is the paradox, the crux of the matter: The idea is shaped in both forward and reverse directions. That topological anomaly is the most crucial single fact about the role of memory in controlling the artist’s performance.

So, the simple act of perfecting a musical performance shifts the axiomatic definition of music, away from the empiricist’s bad metaphysics, in which music is treated as an epiphenomenon of the auditory sense, into those deeper reaches of the human mind where all great art and science commonly reside. Here, within those deeper reaches, is the proper location to examine the true roots of music, in the most ancient forms of the singing of Classical poetry. Here, in seeing what music and poetry share in common with the Classical plastic art-forms and science in general, we may encounter the necessary and sufficient reason, that memory would ultimately produce a Classical *Motivführung*, as the appropriate method of composition.

### ***Poetry, Drama, Painting, and Science***

Compare this paradox with the same paradox as it presents itself in the performance of Classical poetry. For the simplest suitable example, let us employ a familiar case, once again for this occasion: Goethe’s *Mailed*. Until the final couplet, it is a poem by a master craftsman, but otherwise trivial. It is the final couplet which is the poem; yet, all of the couplets preceding that are essential, to make possible the effect evoked by that final couplet.

The artist, in rendering that poem, must anticipate the final couplet, in proceeding, from the first, into the final one. In viewing Raphael's "*School of Athens*," his "*Transfiguration*," or Leonardo da Vinci's "*Virgin of the Rocks*," one must recognize that, in each of the three cases, two views are presented in the painting. The painting, in each case, is neither of the two views, nor a simple addition of the two; the painting—its idea—is the result of the developmental process produced by considering the two primary views in any sequence.

In the classical tragedy of Friedrich Schiller, the same proposition applies, as Schiller himself describes it. The drama begins with a germ, which has all of the elements of the unfolding tragedy, as potential, within it. This process of unfolding proceeds to a moment of decision, which Schiller identifies as the *punctum saliens*, at which the future consequence of the hero's flaw of moral character is visible. Part of the function of the ensuing conclusion of the tragedy, is to affirm the nature of the flaw, by showing the doom which flows from it. The second principal function of the tragic outcome, is to demonstrate that this was avoidable, but for the flaw. However, both of these features of the conclusion exist but to serve a higher-order end: These elements of the drama are designed to evoke joyous optimism in the audience, to demonstrate that we may become efficiently conscious of those flaws, which, uncorrected, would doom us. The idea of the whole which leaps from the tragic conclusion, thus, is the idea which shaped the author's composition of the drama, and must shape the conduct of the actors and director at each moment in mid-performance.

In Classical art-forms, as in science, the ideas of art or science are not the kinds of conceptions associated simply with the experience of the senses. In every case, whether Classical art-forms, or science, the quality of idea which typifies art or science, corresponds to a solution to a corresponding paradox of the senses. Respecting this underlying connection between artistic and scientific ideas, we must place the emphasis here on the notion of causality, as "necessary and sufficient reason" is understood by Gottfried Leibniz, or as Reason is identified to: the same effect by Johannes Kepler.

The same notion of causality conveyed by Leibniz's "necessary and sufficient reason," is expressed in musical performance by the role of the paradox just outlined, above. *It is the governance of each moment of the mid-performance by the guiding role of the idea of the entire composition's perfected result, which is causality in the musical domain of Haydn, Mozart, Beethoven, Schubert, and Brahms.* This is the notion of causation (Reason) in Kepler's work. This is causality for the founder of modern science, Nicholas of Cusa, and for Plato before them all. For exactly this reason, all great scientists prefer the music of Bach, Mozart, Haydn, Beethoven, Schubert, and Brahms: That faculty of the human mind which is indispensable to valid discoveries of principle in physical science, is identical with the mental faculty by which the greatest music is composed and performed. The method of Classical composition which we identify here as *Motivführung*, or motivic thorough-composition, is the mode of



composition which provides the most appropriate model of mental state for the accomplished scientific discoverer.

That is the key to the necessity underlying the discovery and development of motivic thorough-composition.

This underlying identity of the principles of causality in scientific discovery, and also in coherent musical composition, is the key to showing the historical necessity, that the method of motivic thorough-composition should emerge, like well-tempered, *bel canto* polyphony, as an asymptote of that essential aspect of universal history which is progress of forms in musical composition and performance. The essence of motivic thorough-composition, is not contained within the forms with which it is associated. The essence of motivic thorough-composition, is, rather, the necessity for its coming into existence: *the necessary and sufficient reason* for its coming into existence.

To understand music, we must understand the way in which its existence is subsumed by that universal principle of causation which Leibniz terms *necessary and sufficient reason*. Consider that principle of causation from its earliest documented appearance within human knowledge, within Plato's dialogues. Locate the connection of this principle to music, by considering several of the most crucial, most commonplace, but least known principles underlying the common use of spoken language.

It is important, to preface the point, respecting causality, to be developed next, by asserting unconditionally, that Plato's *Parmenides* dialogue must be read as the opening, thematic piece in a series of all Plato's later dialogues. It states, as a devastating ontological paradox, the proposition which those other dialogues address.

For the same reason just given above, respecting the performance of musical compositions, no one should waste his or her time mooted the silly scholars' squabbles respecting the relative, putative dates of writing of each among those dialogues. Ideas do not appear at the moment they are published; any person who has developed more than one valid idea in his or her life, knows, that ideas are written out for publication whenever the circumstances prompt this, not when those ideas are first conceived.

In any coherent mind, as Plato exemplifies this quality, ideas exist in the relative conceptual order of "necessary predecessor," "necessary successor." The order of ideas of a coherent thinker is the order in which they must have occurred, according to that principle of "necessary predecessor," "necessary successor." No serious thinker, would argue, that the order in which topics are published is compelling evidence, in itself, of the order in which the corresponding conceptions appeared in the mind of an author.

If one knows the ideas characteristic of Plato's later works, one must reject the notion that the *Parmenides* is anything but the prologue for, the "necessary predecessor" of the others. If one differs with that, one has understood nothing essential in any among those dialogues. As in the case of any important musical composition of the manifold under consideration, the ordering of the subsumed elements implies the constant idea which governs the unfolding of that series of elements, from the beginning to the close. Indeed, that principle is precisely the subject of the *Parmenides*: the issue of the controversy between the principal characters, Socrates and Parmenides, of the drama. The point made here, is, thus, of a very special type: a self-reflexive, "isoperimetric-like" image of any conception which mirrors its own mirror-image without predefined limit.

The relevant essential issue of the *Parmenides* is the issue of causality. That issue is expressed thus.

Given, a Many (i.e., a "manifold" in the specific sense employed by Riemann's habilitation dissertation), can that Many be expressed as a single idea, a single stroke of conception? Can the Many transitions, and developments linking transitions, all be subsumed under the directing governance of an unchangeable idea of the composition as a whole? The underlying issue posed in that way: Can the diversity of the universe be subsumed under a single, unchanging idea? For example: "Could God exist?" For Plato, He is the Composer, a term which Plato employs in the sense of composer of music or poetry (which, for Plato, are the same thing).

In that dialogue, Parmenides fails repeatedly in his futile attempts to meet that challenge. He fails, as would the biologist, who, asked to define the principled distinction of living processes, responds by comparing the similarities and differences among species. In this dialogue, the key to Parmenides' self-humiliation is but briefly identified: Parmenides has left the principled role of *change* out of account. For Plato, this principle of change, is that of Heraclitus' frequently quoted aphorism: "Nothing is constant but change." Change, rather than things, is substance. On this point, return to the tension between the two, interacting ideas of a musical composition as an entirety.

For Plato, our idea of the perfected performance of the composition, the idea which does not change from the outset to conclusion of the performance, has the form of that which Plato identifies as the *Good*. The imperfect idea of the whole, existing at a moment in mid-performance, corresponds to what Plato identifies as the *Becoming*. This Becoming represents the ontological quality of that principle of change which subsumes a Many. The treatment of these matters of Good and Becoming, flows from the consideration of the ontological paradox posed by the *Parmenides*, through the elaboration provided in the dialogues which the *Parmenides* serves as a "necessary predecessor."

For comparison, consider the way in which the mathematician Georg Cantor applies Plato's respective notions of Good and Becoming to the domain of mathematics. For Cantor, Plato's Becoming is expressed in mathematics as the notion of the *Transfinite*, and Good as the mathematical *Absolute*. For Plato, Cusa, Kepler, and Leibniz, among others, the tension between the Good and the Becoming, is the form of causality in the universe as a whole: "necessary and sufficient reason." Think of these considerations from Plato in musical terms.

The practical significance, for us here, of the positioning of the *Parmenides* among Plato's later dialogues, is that the content of those later dialogues is the foundation upon which a rational comprehension of physical scientific knowledge, and comprehension of musical principles, depends. The relevant features of those dialogues are adduced only when one appreciates those features as responses to the ontological paradox posed by the *Parmenides*. For that reason, it is a commonplace fact, that anyone who attempts to compose a fraudulent representation of the dialogues of Plato, or of Plato's Socratic method as such, will usually suffer a compulsion to offer a fraudulent criticism of the *Parmenides*.

To meet our obligations here, the following summary of Plato's argument identifies the most relevant elements.

Follow Plato, as in his *Timaeus*. For him, God is the Composer of this universe. That composition corresponds to an idea, an idea which is unchanged from the beginning to the completion of the composition. That idea has the quality of Plato's Good, or what Cantor terms, alternately, as Absolute. In each instant of mid-performance, that composition is an unperfected Becoming; yet, the course taken by that Becoming, in each such instant, is shaped under the control of the Good. For Plato, or for the founder of modern science, Nicholas of Cusa, for Kepler, and for Leibniz, that *musical* notion of the shaping of the Becoming by the Good is the meaning of Reason. The notion of natural law, whether in physical processes, or in society, is that same Reason.

Aristotle and his followers, including philosophical materialists such as the modern empiricists, the Romantics, and the positivists, evade Plato's argument. Aristotle gave the name of the deceased "Plato" to a caricature, a *Golem* which he had fabricated for the purpose of intimidating the credulous. To wit: The Aristotelians argue that Plato's "Good" is some final result, perhaps "at the end of time." Therewith, these ostensible critics raise a commotion over such misleading terminology as "Final Cause" and "teleology." On the premise of such straw-man arguments, they each plant their feet four-square in the quicksand of sense-certainty; they insist that the cause of today's object in motion can be nothing other than that which bumped that object yesterday. Out of that four-footed sense-certainty, they attribute any change which might not be explained in a percussive, or kindred fashion, to an epiphenomenon of Aristotle's *Metaphysics*.

The point so bumptiously illustrated, is that the end is not some mystical “Final Result”; like the changeless idea which shapes the enunciation of the composition at each instant of mid-performance, the end is now, and always. Aristotle, like his devotees, presents essentially no more than echoes of the same sophistry employed by Parmenides’ Eleatics before him. The existence of the One which subsumes the Many, is rigorously implied by the principle of change which demonstrably orders the existence of the successive terms of the Many. From the action which shows the hand of the Good, the existence of the Good is known as One.

The musically relevant point to be made, coincides with my presentation of the crucial implications for economy, of Bernhard Riemann’s *Hypothesen* dissertation. Riemann’s discovery is so little known, and so much less understood, that no wasteful burden is placed upon the reader by recapitulating the immediately relevant essentials of that conception here. Riemann is rightly taken as restating a most relevant feature of Plato’s notion in the terms of reference directly applicable to modern physical science.

### *Riemann’s ‘Becoming’*

Put to one side, those warped mathematicians who speak of “the curvature of physical space-time.” Riemann’s often misrepresented discovery (as set forth first in his *Hypothesen* habilitation dissertation of June 1854) has the following principal import for the notion of causality in mathematical physics, and for the principle of motivic thorough-composition in music. The argument, in summary, proceeds as follows.

Today’s generally accepted university-classroom mathematics, finds its origins in a creation of the naive imagination, in an image of space-time like that offered by a traditional classroom reading of Greek geometry. In that naive fantasy, space is defined axiomatically in terms of three primary senses of direction, which are assumed to be extensible, both without limit, and with perfect continuity: backward-forward, up-down, and side-to-side. To time is attributed a single sense of direction: backward-forward. The principal postulates of that notion of quadruply-extended space-time, are the arbitrary assumption that points exist as infinitely small regions of space, whose magnitude is absolute zero, and that a “straight line” is the shortest distance between two points in space. These postulates are required by the axioms of the trebly-extended space manifold.

Neither sense-certainty, nor such a mathematics makes any provision for the existence of cause within our universe.

The attempt to develop a mathematical physics consistent with that naive sort of quadruply-extended space-time manifold, consists of mapping the location of the points within an object such that those correspond to points in naively defined space. Change of that mapping, with respect to time, is assumed to represent a linear form of motion. Forms of

change other than simple displacement in space-time, are defined naively in terms of the simple idea of motion. No provision for cause is supplied.

That species of naive mathematical physics comes into crisis when experimental evidence presents forms of motion, and related change, which can not be accounted for in terms of the axiomatic features of naive space-time. This was already noted by leading figures of Plato's Academy of Athens, and their followers, such as Aristarchus, Archimedes, and Eratosthenes. For example, simple astronomy showed that measurements on the surface of the earth required a spherical geometry, rather than a plane geometry. Kepler's discovery of a principle of universal gravitation from his work on the planetary orbits, is an example of this. Most significant is the impact of Ole Rømer's 1677 astrophysical measurement of the "speed of light" at about  $3 \times 10^8$  meters per second, which prompted Christiaan Huygens to define principles of reflection and refraction, which, in turn, led Jean Bernoulli and Gottfried Leibniz to show that the "algebraic" mathematical physics of Galileo, Descartes, and Newton was incompetent for the domain of physical phenomena, and that a "non-algebraic" mathematics of the transcendental domain, was required, instead.

Each discovery of a physical consideration which causes motion to proceed along pathways contrary to the doctrine of existing mathematical physics, has an effect more or less similar to what Bernoulli showed for the generalized refraction of light. Each of these added considerations assumes the form of extension, in the sense that our naive ideas of space and time are premised upon a general notion of extension. This accumulation of extensions, beginning with notions such as "mass" and of "refraction of a constant rate of retarded propagation of light," represents such a notion of extension. The accumulation of such notions of extension prompts us to describe "physical space-time" by such terms as an "extended manifold of  $n$  dimensions."

All of these  $n$ -fold considerations correlate with our ideas of *measurement*, a measurement of action, of "change." Relative to our naive image of quadruply-extended space-time, these measurements which deviate from linear space-time notions of movement or related change, suggest "curvature": curvature of the relevant motion, or, more generally, relevant change.

It has been generally overlooked by commentators, that Riemann's argument takes us directly into the subjective domain. There should have been no doubt of this among Twentieth-Century scholars, who had the crucially relevant, posthumously published works before them: the *Metaphysik und Psychologie* implicitly referenced, in mention of Herbart together with Gauss, in the *Hypothesen*. Simply, the development of the idea of the  $n$ -fold physical space-time manifold reflects a series of discoveries of physical principle: It is the word "discovery" which would persuade any alert scientist, that physics has proven itself to

be a branch of rational psychology, a topic, like music, rooted in the subjective domain. This is the crucial feature of Riemann's discovery.

That crucial feature centers around the following issue. Like a modern positivist's perversion of a theory of musical counterpoint, all formal (i.e., deductive) mathematics has the form of a deductive theorem-lattice. That is to say, a set of propositions which have been elevated to the dignity of theorems, on the presumption that it has been demonstrated that each and all are not-inconsistent with an underlying set of interdependent axiomatic assumptions. A deductive form of mathematics for a quadruply-extended space-time, is an example of such a theorem-lattice; any formal mathematical representation of an  $n$ -fold physical space-time manifold, is an example of this.

Any change within the set of interdependent axioms of such a theorem-lattice, produces a new theorem-lattice which is formally and pervasively inconsistent with the lattice premised upon the unchanged set. In the language of both Plato and Riemann, any such set of interdependent axioms is termed an hypothesis; any change in the set, represents a new hypothesis.

It is to be noted, respecting any reading of Riemann's *Hypothesen* paper, or later papers on mathematical-physics topics, that this significance of the term "hypothesis/hypotheses" is the permeating theme of all Riemannian mathematical physics. Notably, it is upon this basis that Riemann exposed Isaac Newton as a bungling empiricist, a scientific illiterate (see "Why Most Nobel Prize Economists Are Quacks," *EIR*, July 28, 1995, p. 31, note 30).

Thus, each of the validated discoveries of principle which alter the preferred choice of  $n$ -fold physical space-time manifold, represents a change of theorem-lattice, a change in the set of interconnected axiomatic assumptions underlying mathematical physics. This change is predominantly a change in the ontological axiomatics, rather than the spacetime form as such. The appropriateness of the new mathematics over the old is shown in the domain of measurement of motion, or of analogous action. There will be a change in the characteristic feature of measurement of such motion or other action. To this end, it is desirable, but not imperative that the correct measure be made; it is sufficient, at the outset, that it be shown that a certain quality of change in measurement is required.

Although the measurement itself lies ostensibly within the domain of what pedants reference as "scientific objectivity," the act of discovery which produces the appropriate new mathematics does not. Our attention should then be turned to the fact, that all valid science (and art, too) is the product of a faculty of discovery of this sort. There is an adducible principle presented to us by the evidence of the relatively valid discoveries of principle of all human knowledge to date: the unique faculty, by means of which valid, axiomatic-revolutionary discoveries of principle are made. This faculty we name "creative reason," the

faculty by which man and woman were known to the Moses of *Genesis* 1:26–30, to be made in the image of God the Creator.

This faculty of creative discovery, is the sole means by which mankind's power over nature has been increased from the ape-like potentials of several millions living individuals, to those potential relative population-densities, and associated improvements in demographic characteristics, which had become the benchmarks of human progress into the middle 1960s. This principle of creative discovery, which a child experiences each time he or she replicates the original act of discovery of some valid, axiomatic-revolutionary principle, is the proximate cause of the increase of mankind's power over nature per capita: It is the psychological cause of a physical effect. How do we represent that causation, mathematically?

Therewith comes the fun, the topic which is crucial for understanding motivic thorough-composition.

The inconsistency bridged by the transition from one theorem-lattice to another, has the mathematical, and mathematical-physical (i.e., ontological) quality of what is termed variously a (formally absolute) mathematical discontinuity, or a singularity. This might be depicted graphically by a point which is of unlimited smallness, but never mathematical zero, or a line whose thickness is, similarly, of unlimited, never-zero smallness. The increasing accumulation of valid axiomatic-revolutionary discoveries of principle, over the course of human existence to date, thus represents an accumulation of such discontinuities, an accumulation expressed as implicitly denumerable; thus, the transmission of that culture to a person today, awards that person a quality of knowledge which might be expressed in terms of *density of discontinuities per interval of action: action of thought*. In other words: describable as an  $n$ -fold physical space-time manifold. This form of manifold, associated with functions of increasing density of such discontinuities, is characteristic of not-entropic processes, such as living processes generally, the human cognitive functions, and the action which typifies successful societies.

Any musical composition which satisfies the requirements of motivic thorough-composition, has the same quality as creative scientific generation of a valid, new theorem-lattice. It is that quality of distinction, which defines the musical composition as a whole, as a unit musical idea unique to that composition. The kinds of modal transitions which Wolfgang Mozart defined in practice, by his 1782–86, and subsequent development of a Bach-pivotted method of motivic thorough-composition, are exemplary of this. Beethoven's revolution within Mozart's own motivic method, a revolution exemplified by the late quartets, is also exemplary of this. It is the modal feature which Mozart understood in the Bach *Musical Offering*, and the extension of that same modal principle by Beethoven, by a topological revolution in modalities, which exemplifies composition effected by a pure act of coherent

creativity: the generation of a relatively absolute musical idea by means of a succession of revolutions in treatment of a pair of root-intervals, these representing, like the Bach/Mozart C-minor/C-major modality, a single modal germ.

Shifting focus back to Riemann for a moment: Apply Riemann's notion of hypothesis to the axiomatic-revolutionary progress of mathematical physics, to date. Let us, for purposes of first-approximation, apply that idea of the progress of physics in general, to the examination of this ongoing composition taken in mid-performance. We have an "objective" measurement, which shows us that this is progress: increase of potential relative population-density, a characteristic measurement of action of a society practicing a certain development of scientific knowledge. We should know, if we render ourselves conscious of the experience of replicating the act of discovery of valid axiomatic-revolutionary principles, the method of action—the notion of modality—by means of which the progress is generated. We are then prepared to treat the execution of scientific progress as an accomplished performer renders a great musical composition. We have then joined Plato and Kepler in knowing the universe as a composition. We have then joined Leibniz in comprehending the principle of necessary and sufficient reason. We have then addressed the significance of Riemann's discovery. We have then uncovered the importance of Mozart's and Beethoven's successive revolutions in the application of the principle of motivic thorough-composition.

Now, turn to the common root of music and mathematics, the *bel canto* vocalization of the spoken utterance.

### *Derrida's Cacophony*

The communication of ideas within society is accomplished chiefly by aid of that spoken utterance, called speech, whose pale shadow is the written word. The idea communicated is contained within neither of the two verbal media, although properly sung oral utterance is much closer to reality than the *New York Times Manual of Style and Usage*, or the presently popular, Derridaesque lunacies of the Modern Language Association (MLA)'s politically-correct "de-phonization" of the written language.

Oral utterance is vocalization, as the natural *bel canto* potentialities of the human speaking apparatus require. Oral utterance demands singing-voice registration as an essential component of written utterance. The literate form of spoken word, such as William Shakespeare's stage, for English, is a vastly more powerful medium than the written word, except to the degree that the reader, and also the writer, share the understanding that the written utterance is to be reconstructed, phonically, as it had been spoken, in a *bel canto* singing manner, with register shifts, as by a classically-trained actor of the Classical Shakespeare or Schiller theater. Competent punctuation, in opposition to the MLA and *New York Times Manual of Style and Usage*, is applied to the purpose of prompting the



reader to reconstruct the Classical—e.g., Shakespearean—form of oral utterance intended by the written passage. Great poetry, Classical tragedy, and the apotheosis of Classical poetry, as song composed in a mode of motivic thorough-composition, are the richest media for transmission of ideas in speech.

In oral, or written utterance, as in the great Wilhelm Furtwängler's musical performances, ideas sing between the words, as the musical idea sings between the notes of the score. Speaking broadly, the key to comprehending these distinctions, is *irony*; as Riemann's work illustrates the related case for mathematical physics, the idea-content of speech lies outside the narrow band-pass of either oral or written dictionaries and grammar, in the higher domain of *metaphor*. Symbolism, by contrast, is for the *Brotgelehrten*, the sexually hyper-active, the oafs, or to use a gentler term of reproof among professional musicians, *Romantics*. As in discovery of principle in science, ideas come into existence as formal discontinuities, as singularities.

Our palette presents us, thus, three distinct notions of spoken communication: first, the idea itself, which can not be contained within the band-pass of speech as such; second, the literate form of utterance, the highest form of communication; and, third, the written shadow of spoken utterance, which is literate only to the degree that the composer (author) and re-composer (reader) understand that the written text is supplied to the purpose of prompting the hearing of the implied, literate spoken utterance in the mind of the reader.

For example. A literate written text is that which, among other qualifications, is written and punctuated from a literate, e.g., a phonic, standpoint: to reflect voice-register shifts, to set off clauses and phrases serving as subjects, predicates, or appositives, and kindred speaking-voice requirements. An illiterate spoken text, is one which attempts to intone a written text in a sing-song, or any other among those otherwise stylized manners designed for oral rendering of written text, as typically acquired in classrooms or analogous settings.

Notably, the worst performances among musicians who have acquired physical and related qualities of technical proficiency, are derived most visibly—and painfully—from a carrying over, into reading of the musical score, of the tendency to read the written text of prose or poetry as if there existed a written language which had its own primary existence, rather than existing as a mere shadow of sung prosody. Long before there was the cacophonous doctrinal babbling of Jacques Derrida, there was already the well-established, psychosexually impotent belief in the original existence of text (as of score).

Within the domain of the professional musician, this fanatical perversion appears commonly as the dogma of "instrumental music." The customary root-doctrine on this point, is that of the Nazi-like cult of Dionysos and Richard Wagner, that music derives from dance, rather than the vocalization of poetry. These are the Dr. Sigmoid Frauds of the musical slums,

existentialist followers of positivists such as Ernst Mach, doctrinaires of the ilk who attribute all aesthetical values to not only sensual effects as such, but, preferably, sexually-orgiastic ones.

The effort to promote a cult of “instrumental music,” denying the ancestry of all music in the polyphonic vocalization of poetry, is the work of the existentialist “Derridas” of the musical salon and conservatory, and, of the like of the Austro-Hungarian *Geheimpolizei*, who administered the musical policy of the empire under such notorious “doges” of the *Fürstentum* as chancellors Wenzel von Kaunitz and Klemens Prince von Metternich. Similarly, in Metternich’s circles in Prussia, the relevant administrators were the neo-Kantian Romantics G.W.F. Hegel and, more emphatically, the forerunner of the Hitler regime’s philosophy of law, Friedrich Savigny.

Underlying this more immediately obvious parallel between the doctrines of text in literature, and of “instrumental music,” there is a deep-going, causal connection.

Once those misleading presumptions of the written text have been placed to one side, thus, we may focus upon those crucial features of the relationship, between literate forms of oral utterance and music, which bear upon the origins of motivic thorough-composition.

Neither speech nor the literal aspects of a musical score, can convey ideas within that medium as such. As Classical poetry underscores the relevant aspect of spoken, and sung language, it is the metaphors which are the sole “repository,” so to speak, of the actual ideas. This role of metaphor is the feature of poetry which the popularized doctrines of symbolic interpretation are supplied to conceal and deny.

The use of irony to achieve metaphor, is the most crucial feature of human speech, and of music, the aspect of communication which enables one mind to provoke the synthesis of an idea within the mind of another individual. All important ideas are of this form; they express the same problem, and solution, posed by the fact that an entire new theorem-lattice is separated from the predecessor which it replaces, by a single singularity (e.g., mathematical discontinuity). It is by breaking the bounds of literal reading of the existing usage of language, that metaphor enables us to enter a domain of relative higher *cardinality*, as from a manifold of  $n$  degrees of extension, to one of  $n+$  degrees. The precondition for this, is that the ironies associated with the metaphor are real, that they correspond to identifying a fallacy of principled assumption in the previously accepted use of that language.

Hence, the intrinsically pseudo-scientific character of so-called “information theory.” Since the change introduced by the use of the metaphor defines implicitly an entirely new theorem-lattice, of higher cardinality, the quantifiable effect of the relevant communication

is, axiomatically, vastly greater than the adducible absolute statistical potential of the medium employed.

The metaphor employed to this effect, can not be located within the channel of communication between the speaker and the hearer. The channel reveals only the ironies with which both the speaker and the hearer associate the metaphor. The metaphor itself exists only in the minds of each of the persons, not within the medium of communication. It is upon this aspect of the matter that we must presently focus most intently.

For most readers, the principal source of the difficulty which the professionals experience with our line of argument, is the combined impact of two facts. First, all but a vanishing handful among them are either totally, or virtually bereft of consciousness of a Classical humanist method of education; the defects in their education have denied them the references which would make the notion of creative discovery readily accessible to one educated by that Classical method. Second, during the recent centuries, especially in the aftermath of British triumphs in wars, the empiricist method has also triumphed politically among not only the vanquished European nations—first France, and later Germany. After the premier opponent of British imperialism, the U.S.A., succumbed to a “special relationship” with Presidents Theodore Roosevelt’s, Woodrow Wilson’s, Coolidge’s, Harriman’s, and Bush’s beloved Britain, the Svengalis of empiricist dogma have gradually subdued the Trilbys of the dominant educational and cultural institutions of the planet, and also the popular culture of western Europe and the Americas.

That source of difficulty need be identified and stressed, that the crucial point be made comprehensible. It must be stressed, that in a Classical humanist mode of education, as typified by the Wilhelm von Humboldt gymnasium program for Germany, the emphasis is upon the student’s reliving the original act of discovery of the important discoveries of principle, in every leading department of knowledge, throughout history to date. In this way, instead of merely learning the answer, the student comes to know the answer. More significant, the student who benefits from such Classical rigor in education, is made conscious of his or her own creative-mental processes, by means of which the original discovery is replicated within the student’s own mental processes. The result is to be compared with the musical case under consideration here.

In each case the student replicates the mental act of discovery of an axiomatic-revolutionary quality of solution-principle, the student is doing much more than learning the textbook answer for the relevant examination question. By reliving the act of axiomatic-revolutionary discovery, with the student’s own sovereign creative-mental powers, the student arrives at a relatively absolute idea, of the form of Plato’s Good. This idea thereafter governs the student’s re-replication of the act of discovery, as the idea of a completed musical

composition acts to control the re-replication of the process leading toward a repetition of that completion. It is the tension, between that relatively Absolute idea, and the relative Becoming, the process of completing the discovery, which is the active expression of knowledge in that case. This process can occur only within the creative-mental processes of the individual person; it can not be supplied in an articulate form in a medium of communication among persons. The communication-process's function, is not to communicate the idea of the discovery, but merely to prompt the mind of the hearer, to replicate the creation of that discovery.

In the case, that the speaker succeeds in prompting that replication in the mind of the hearer, we may speak of the speaker's expressed *insight* into the mental processes of the hearer. In that case, the speaker has employed his (or her) own mind, to construct, as-a kind of "subset" of his own mind, a kind of analog of the hearer's mind. His object, is to select a pattern of "signals," which, expressed through a medium of communication, will tend to prompt the hearer's mind to engage in the desired process of creative replication. In sum: Classical-humanist pedagogy, as distinct from the deplorable, empiricist kind. The gifted composer, such as a Bach, Haydn, Mozart, Beethoven, Brahms, employs the same principles of Classical-humanist pedagogy to compose, and to teach their students, just as Wilhelm Furtwängler devised his tricks for evoking the necessary, but unsayable musical result from his orchestras.

Real ideas do not exist within the "band-pass" of any medium of communication, of spoken or written language, or formal mathematics, included. Nor, could they ever be replicated by a digital computer. They exist only within the human mind. The function of communication, is to enable one individual mind to prompt a replication of the creative thinking process in other human minds, much as Furtwängler shaped the musical insights of the musicians within his orchestras.

It is a matter of measurement. Living processes, discovery of valid scientific principles, the use of those creative processes to generate or to replicate artistic ideas, and scientific and technological economic progress, are each and all "not-entropic" processes. That is to say, that the characteristic measurement of the relevant, distinguishing form of action is "not-entropic." This can not be measured by any possible linear, or merely "non-linear" standard of measurement. Only the sovereign creative-mental processes wholly internal to the individual human mind, can generate, or willfully replicate a "not-entropic" conception.

Within the relatively entropic domain of formal mathematics, written language, grammatical utterance, or musical score, there is no place for creative ideas to dwell, except as discontinuities. These discontinuities dwell among, but not within the words, the mathematical formulations, the notes of the musical score. They are expressed by aid of the

ironies whose manifest effect is to generate discontinuities. The ideas to which those discontinuities correspond, as do footprints to the person who walked that path, exist for language, for mathematics, and for music, only in that empyreal subjunctive where all true metaphors reside. For music, they are to be heard by the individual's inner ear of insight, between the notes.

Thus, in literate forms of language, we have three objects to consider: the spoken utterance, the written shadow of the spoken utterance, and the object to which the utterance refers, but only the inner mind of the utterer can know. In all cases of those concepts which deserve the reputation of knowledge, the essential concept is relatively Absolute, in the sense of the form of Plato's Good. The essential concept controls a second, subsumed version of the same concept, in the form of Becoming, in the process of emergence. Every other idea is subsumed by the electrifying tension of the interaction between these two.

***Thus: 'Motivführung'***

From the vantage-point of memory, the desired general goal in the development of methods of musical composition, is an increase in coherence: that each step in mid-performance, from the first to the last, brings the process of becoming into coherence with the indivisible idea of the composition as a whole. This must be achieved with the relatively greatest power, or apparent "energy" of the performance, which can be achieved only by increasing the density of discontinuities per interval of action. In other words, the intensity of the development. As the third movement of Beethoven's Opus 132 quartet, the *Heiliger Dankgesang*, epitomizes this, the most challenging development must be achieved with the most concerted expression of *agapic* beauty.

A not uncommon misunderstanding of Beethoven's later compositions, notably the late string quartets, supplies negative illustration of this point. The dupe of the modern musicologists' Hegelianizing, is soaked in a mystical delusion which might appear to have been first induced in the following manner.

According to imputable legend, the deed was done by the plainclothes *Poltergeister* of the Austro-Hungarian secret police, who, at the moment, lurked in the nooks and crannies of the 1814–15 Vienna Congress. One moonless night, while the delegates to the Congress were distracted by some drunken celebration, out from their lurking-places, slipped the evil earth-spirits of the mystical Central-European underworld.

They moved by shadow, to shadow, into the musical neighborhoods; there, from the infants in their cradles, they ripped out the capacity to compose and hear music in a Classical mode (which, incidentally, had been performed at Johann Sebastian Bach's A=430 cycles). One could hear the monsters' fiendish giggling (*sotto voce*, of course), as, into the minds of the

ravished infants, they inserted the changeling souls: the dispositions to compose, perform, and hear in the politically correct, Romantic manner (tuned to mad Czar Alexander I's A=440 cycles). All of this substitution was decreed, and duly notarized, over the great seal of Chancellor Metternich. In the morning, the blurred senses of the late-awakening households' members noted little change, except, perhaps, that the diapers were somewhat dirtier than usual.

Thus, according to the fantasy told by balding musicologists to the gaping credulous, 1815 marks the point in time, at which the Classical impulse "within composers, performers, and audiences vanished, and the Romantic impulse pervaded the universe, instead. A fairy-tale? Perhaps; but, what the modern musicologists describe as the result, if true, could not have occurred in a way much different than the account we have just reported here.

This, sadly, is not the end of the tale. Near the turn of the century, the prank was repeated, once again in Vienna. The same imps, from 1815, now replaced their Romantic changelings with Modernist ones. This time, the morning diapers were terrible.

One might wonder, if news of the latter event trickled down to G.W.F. Hegel, wherever he resides, below. If so, Hegel and his old crony, Friedrich Carl von Savigny, shared a fiendish smile. Many musicologists, to the present day, appear to think so.

The principal evidence supporting this snippet of feudal folklore, is that modernized audiences pretend, at least, to enjoy the mauling of not only post-1815 Classical compositions, but also Mozart, as parodies of the style, perhaps, of Hector Berlioz. Sometimes, the works of Beethoven are appreciated almost as if they were smudges composed by Stockhausen; certainly, the late string quartets have been prey to such mistreatment more than once. It is a matter of dogma for some, that they must impose the raucous sound of their pedantic conceits upon Beethoven's intent; the supernal beauty of the *Heiliger Dankgesang* does not penetrate the thick brain-callous of their indoctrination.

If the unchanging idea of the perfected composition, must govern the performance in progress, from beginning to end, can not the idea of this relationship inspire the composer to improve the method of composition accordingly? Should the idea of the composition as a perfected whole, not guide the composer in his building the composition, step by step? Thus, to achieve a less imperfect coherence, in the process of composition itself, must we not desire, that the idea of the perfected composition should be, like a Schiller tragedy, an implication of some simple germ, from which the composition as a whole unfolds?

Can not the relationship, between the intended Absolute idea of the composition, and that germ, not be the generating principle under whose governance ("tension," "energy") the composition itself unfolds? As soon as we progressed, from formalist's modulation among

keys, into the integration of a complex of keys into a single mode (as the Bach C-major/C-minor mode illustrated the point for the Wolfgang Mozart provoked by Haydn's new quartets), the required new idea of composition was implicitly identified. Once Mozart's notion of motivic modalities were drawn beyond its initial limits, by a genius such as the matured Beethoven, music may expand the range of modalities greatly, as he, at the outset, doubled the number of apparent keys we must recognize as awaiting us within a *bel canto* well-tempered system.

That revolution within the bounds of the Classical methods of well-tempered polyphony is not an arbitrary, if clever innovation, which one might choose to adopt or ignore. It is the unevadable solution to a profound scientific, and moral problem. Once we had adduced that Platonic function of memory, which renders Classical composition a way of representing the lawful ordering of the universe (this, according to what Leibniz recognizes as necessary and sufficient reason), we could not have been satisfied, until we had freed future musical composition from the pretty bric-a-brac extraneous to that principle. The discovery of motivic thorough-composition, satisfies that requirement.

The added obligation, which we must impose upon all composition in this expanded, nobler modality, is that it must never cease to be heard in the mind, and so displayed, as a domain of empyreal beauty.

Finally, before leaving this stage, to make way for the ensuing presentation of *Motivführung* as such, we must now turn to our culminating point. We must show why we selected the manifold we identified at the outset of this exposition. In light of what we have reviewed thus far, consider the species of apparent difficulties presented to the musical performers as we shift from the soloist, to the duet, and then to the quartet or quintet. Define, as a single conception, the common solution-principle for each and all among those cases.

The key to that manifold, is the sovereign creative powers of the individual mind. For reasons identified earlier here, the performance of great music, must employ the powers of insight, by both the composer and performer, to provoke the generation of the idea from, separately, and more or less simultaneously within each mind of the audience. So, the musicians on stage must interact with one another, to produce the same result as a combined effect of their performance.

So, the essential idea of musical performance, begins with the singer, singing his own composition, as accompanied, like Plato or Leonardo da Vinci, by his own lyre, or a Wolfgang Mozart or Beethoven performing one of his own previously composed solo works. A musician's performance of another's composition, introduces a new dimension: The performer must recreate the mind of the composer within his own, and let the composer's intent provide the insight into the mind of the audience. In a duet, performing the work of a

great, but deceased composer, the performers add a new dimension to the challenge. With the Classical quartet or quintet, the challenge met in the duet, is drawn to the limit.

With the orchestra, the underlying principle is the same, but the problem of execution is somewhat different. In the transition from thorough-composed works for duets, trios, quartets, and quintets, to the orchestra, or large chorus, a new manifold is introduced. The emergence of the specific role of the musical director parallels the shift from the individual performer, of the first performing manifold, from the performer-voice, to the performer's participation in the voice of a part. In place of the individual musician performing a voice, several or more musicians participate in reproducing a part-voice; the function of their sovereign individuality, as performer, is shifted in that manner and qualitative degree. Otherwise, the deeper principle, common to both performing manifolds, remains the same. With that qualification, our attention can be focussed upon the smaller scale of performing manifold.

The key to the role of the individual performer, in the smaller manifold, is already signalled in the score, in a close reading of the composer's treatment of polyphony. This serves, later, as also the key to the transition from the smaller to larger musical-performance manifold. The polyphony is already a manifold of human singing voices. This polyphony is the drama which the musician, or ensemble, must perform; that provides the key to the composer's insight into the minds of that audience to which the performers must deliver the intended result, the intended musical idea.

These matters are not to be seen as idiosyncrasies of the musical domain. They are those characteristics of well-tempered musical composition and performance which render music in general an indispensable spiritual nourishment of the *agapic* creative powers of reason, as creative work may occur in any honorable profession. These characteristics, perfected in execution in the degree motivic thorough-composition represents, are identical to the creative powers of valid, fundamental scientific discovery. These matters of music are not optional, not matters of taste, but indispensable habits for the maintenance and progress of civilized existence.

Classical Music, like the Negro Spiritual addressed by Brahms's Antonín Dvořák, is the apotheosis of that empyreal beauty which is known in science, as the submission of the human creative will to a principle, a principle which Gottfried Leibniz identified as *necessary and sufficient reason*. Like the development of J.S. Bach's well-tempered mode of natural *bel canto* polyphony, motivic thorough-composition, otherwise named *Motivführung*, is a natural and necessary realization of that principle.

That, my friends, is a principle to be committed to memory.