

APRIL 27, 1987

# Art As Science: The Case of Music

by Lyndon H. LaRouche, Jr.

*The editors of EIR are happy to publish here, for the first time, an article by Mr. LaRouche written on April 27, 1987 as part of a series of articles on the same subject. On October 6, 1986 there had been a massive raid on EIR's office and Mr. LaRouche's residence by the very same forces that are today involved in an ongoing coup attempt against President Trump. Mr. LaRouche was then targeted for elimination by the British Empire forces that had deemed LaRouche's collaboration with President Reagan on the Strategic Defense Initiative (SDI) intolerable.*

In western Europe and the Americas during this century to date, what is widely accepted as “modern” and “popular” art, is consistently nothing but ugly rubbish, painting, music and poetry most emphatically so. In part, this state of affairs is symptomatic of civilization's growing decadence, and symptomatic also of the importance which a decadent culture's art-forms attribute to the trivial and to the novelty of the merely eccentric. This state of affairs it not merely a reflection of the unwholesome spirit of recent times. It is also a consequence of modernism's virtual extinguishing of the principles of composition known to the Classical painters, poets, and composers, a suppression dating since, most notably, the introduction of the irrationalist fad known as Romanticism, beginning the 1815–1849 period.

In this memorandum, we restate, as summary, what we have discussed on several earlier occasions, one aspect of modernism's suppression of knowledge of

Classical art, what was done to Classical music. We shall attempt to show, we hope, more effectively than earlier, that the issues go far beyond the issue of music as such, touching upon the most profound questions of morality and scientific method.

To show those uninformed of the fact, that such an arbitrary, politically decreed change in musical standards did occur, the simplest illustration with which to begin the exposition, is reference to imposed changes in pitch, and then continue from that to some closely related matters.

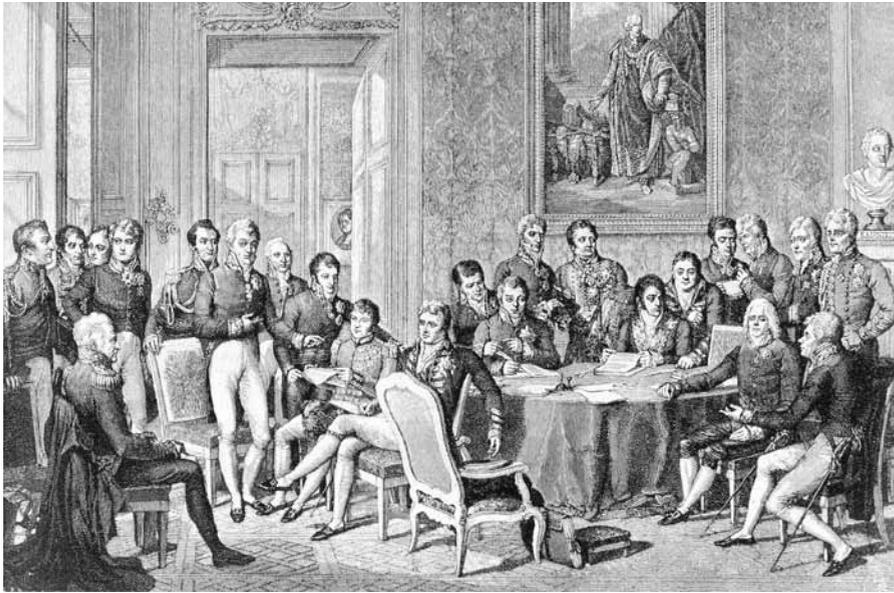


Portrait by Elias Gottlob Haussmann, 1748  
*Johann Sebastian Bach (1685-1750)*



Portrait by Joseph Karl Stieler, 1820  
*Ludwig van Beethoven (1770-1827)*

It is clear from a combination of evidence, that the principal Classical composers, from J.S. Bach through Beethoven and beyond, based their compositions either on a well-tempered scale, or an equal-tempered rough approximation, in which the value of A above middle-C was approximated at some frequency between 427 and 432 cycles per second. The musical instruments constructed during the eighteenth and early nineteenth centuries demonstrate this; the songs written by these com-



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*The 1814-15 Congress of Vienna determined the shape of Europe after Napoleon's defeat at Waterloo. A contemporary engraving by Jean Godefroy, after a painting by Jean-Baptist Isabey.*

posers contain crucial internal evidence which is even more conclusive to this effect.

During the proceedings of the 1815 Congress of Vienna, the effort was made to impose the British, higher pitch of the Russian Czar's military bands upon western Europe. About 1849 onward, the construction of keyboard and wind instruments was altered, to enforce a higher pitch. A higher pitch was politically enforced by the Austro-Hungarian Empire beginning 1885, and a number of other radical alterations in conception of singing were introduced early during the present century. Also, during the latter half of the nineteenth century, a false definition of the musical scale and pitch were introduced from Britain, chiefly by aid of the hoaxster Wilhelm Helmholtz, together with an attempt to eliminate the principles of beautiful singing extant since no later than the fifteenth-century Golden Renaissance.

Gradually, these politically motivated changes in

sians, once again, and by their Cini Foundation accomplices at Venice's San Giorgio Maggiore.

The controversies involved did not begin in 1815, nor was Classical composition crushed out of existence by 1849. Although professional butchers perform



CC/Wolfgang Moroder

*The Benedictines of Venice's San Giorgio Maggiore have consistently been sworn enemies of truth and beauty in music, and sworn enemies of Saint Augustine.*

Chopin, Schumann, and Brahms as "Romantics," these persons were Classical composers in a way which absolutely distinguishes their methods of composition, and required approach to performance, from the contrary approach of a Berlioz, Liszt, Wagner, *et al.* (Similarly, some academic fanatics even insist that Heinrich Heine was a Romantic poet, although Heine's writings define him as the most knowledgeable and ruthless opponent of Romanticism and its method.) The special significance of the way in which Romanticism was imposed, politically, top-down, upon all of Europe over the course of the nineteenth century, is that this involved a determined and concerted effort to destroy even the memory of the

musical values and methods, those introduced first by the Romantics, and those later by the Modernists, were imposed upon performers by a well-organized musical "mafia" controlling the concert halls. The music schools bent to the political and economic pressures. The absurdities arbitrarily imposed upon concert performance and teaching were drilled into successive generations of music students, each generation more ignorant than the last of the knowledge essential to competent performance of the Classical masters. Today, standard pitch is being moved from an already distorted A=440, imposed on music politically earlier, to musically impossible heights of an A=450, as demanded by the Rus-

most elementary principles of Classical musical composition and performance.

Today, that effort has largely succeeded, if not yet entirely. With diminishing numbers of exceptions, the rudiments of Classical musical knowledge are vanishing among the ranks of professionals, and the audience for Classical musical culture has all but disappeared, relative enough to the state of affairs two decades ago.

Admittedly, the effort was not entirely successful. A minority among gifted performers, mastering the original editions of Classical scores, without Romantic and Modern editions (or, Arturo Toscanini's hoaxes), have reproduced the original with great power and insight, sometimes after decades of reworking their repertoires in search of a true performance of the composer's intent. Yet, in the main, the musical schools and run-of-the-mill professional musicians today, know nothing of the most elementary principles of music, although the conceit in their laboriously acquired ignorance is seemingly limitless.

For various reasons, the leaders of musical development in Europe during the late eighteenth and early nineteenth centuries, were Italians and Germans, with Germans becoming dominant for special historical reasons. So, the attempt to eradicate Classical musical composition was launched chiefly from inside Germany. Two key political figures of Germany were the leaders of this assault, Immanuel Kant and Berlin law professor Friedrich Carl von Savigny. Kant's *Critique of Judgment* was the launching-point for the destruction of all Classical art; Savigny carried Kant's beginning to its limit, and provided the political rationale used to crush Classical art almost from existence.

The influence of handed-down frauds, as putatively professional musicianship, cannot be combatted merely by introducing afresh what has been suppressed. Credulous professional musicians and others will automatically reject the truth, because they have committed so much of their personal identity to a miseducation in the matter. The miseducated will not begin to learn, until they are not merely made aware of the monstrousness of the frauds they accept as authority, but until they are so much disgusted by the knowledge of how they have been miseducated, that they are motivated by a deep



Fra Luca Pacioli (c. 1477-1517)

Painting attributed to Jacopo de' Barbari, 1495

sense of shame to correct this error. Thus, without showing them that they are mere dupes of hoaxes set afoot by Kant and Savigny, most notably, no improvement among most contemporary musicians were likely to occur.

However, before turning to Kant's and Savigny's roles in destroying Classical art, we must step back a moment, to identify what it was that these two scoundrels sought to destroy.

### The Science of Aesthetics

Since no later than Classical Athens, the idea of beauty in art, whether in architecture, sculpture, or music, was associated with the recognition that living processes were characterized by a different harmonic ordering in their forms than non-living ones. It was also recognized, that the harmonic orderings of form of living processes were consistent with certain constructions based on the circle. The unified design of the Athens Acropolis as a whole, and the elaboration of the principles of musical harmony in Plato's *Timaeus* dialogue, are illustrations of this.

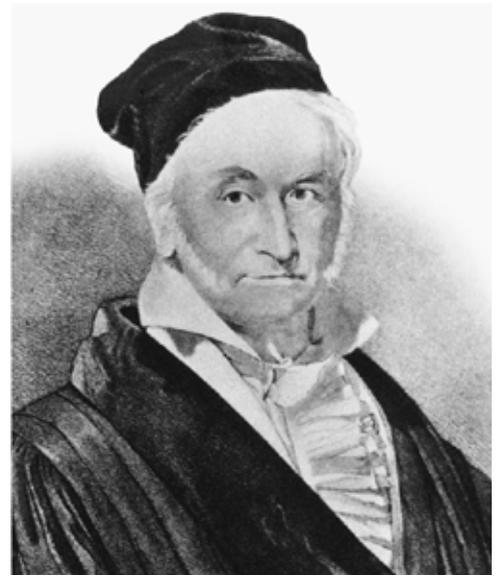
The essence of aesthetics is, that life is beautiful and death is ugly. The discovery that living processes have distinctive harmonic orderings of form, distinct from non-living ones, is the fundamental principle of Classical aesthetics in all forms of art.



Nicholas of Cusa (1401-1464)



Johannes Kepler (1571-1630)



Carl Gauss (1777-1855)

This conception of Classical aesthetics was radiated throughout medieval Europe through the influence of the writings of St. Augustine, shaping aesthetics in music, in the plastic arts, and in the composition of poetry. France's great cathedral at Chartres is an example of this. The sonnets of Petrarch are another example of this. Europe's adoption of the octave well-tempered musical scale is a consequence of the latter's concurrence with Augustine's influence.

These principles of Classical aesthetics were most richly developed in Italy during the Golden Renaissance, with Leonardo da Vinci and his great successor Raphael the dominant figures for modern reference. Leonardo's principal collaborator during the Milan period, Fra Luca Pacioli, was crucial for Leonardo's advances in Classical aesthetics. Pacioli reconstructed the proof of the uniqueness of the five regular, platonic polyhedra, reported in Plato's *Timaeus*. Pacioli, Leonardo, and their collaborators demonstrated conclusively, on the basis of Pacioli's reconstruction of that geometric proof, that all living processes were characterized by an harmonic ordering of form congruent with the Golden Section of the circle.

With one qualification, this harmonic characteristic of living processes holds true today. Except in the very, very large (astrophysics) and the very, very small (microphysics), any process whose form is harmonically ordered in congruence with the Golden Section, is either a living process itself, or is something constructed by a living process. The well-tempered musical scale is so harmonically ordered.

The conclusive proof that the well-tempered scale is the only natural scale for music, was supplied by the founder of modern mathematical physics, Johannes Kepler. Although Kepler studied music in Italy, and was familiar with as much musical principle as was known at that time, his proof of the unique naturalness of the well-tempered scale was based on astrophysics, rather than music as such. We shall come soon enough to the decisive bearing of this fact on the nineteenth-century efforts to destroy Classical musical composition.

Kepler's calculations are not perfect ones. It was not until the work of Carl Gauss, during the first half of the nineteenth century, that our mathematical physics was developed sufficiently, both to prove conclusively that Kepler had been correct in every principle of his hypothesis, and to enable us to understand the calculations more precisely. As a first approximation, Kepler's physics was correct, whereas the contrary physics of all of his detractors, such as Galileo, Descartes, and Newton, was absurd on all points of difference with Kepler.

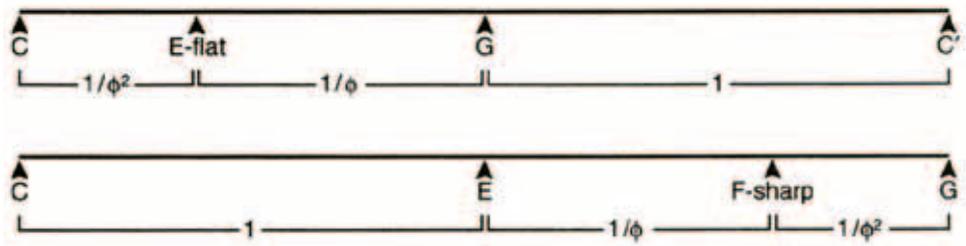
Kepler started from several major discoveries in physics and theology by Leonardo's major predecessor, Nicholas of Cusa. This included Cusa's solution to the problem of Archimedes' efforts at quadrature of the circle, and Cusa's formulation of the solar hypothesis adopted as a starting-point by Kepler. Kepler incorporated the crucial discoveries of Pacioli and Leonardo, including the continuation of aspects of Leonardo's work by Albrecht Dürer. From this standpoint, Kepler

considered the mass of astronomical data, and said, in effect: For this to make sense, there must be a definite, lawful ordering in the composition of the solar system which these observations must fit. He formed the hypothesis, that the planetary orbits of the Solar System were harmonically ordered in a manner congruent with the Golden Section.

The stunningly conclusive empirical proof of the correctness of Kepler’s solar hypothesis was discovered by the young Carl Gauss at the turn of the nineteenth century. Kepler’s construction of the planetary orbits required an inherently unstable planetary orbit lying between the orbits of Mars and Jupiter. Kepler supplied the orbital harmonic values for this missing planet. Gauss proved that the asteroid Pallas, then just discovered, conformed to Kepler’s harmonic values for the missing planet, suggesting that the asteroids are the rubble of a demolished planet with those harmonic orbital values, or, wandering material which had been entrapped in such an orbit.

The fact that a scientific hypothesis not only measures the lawful ordering of known objects with highly significant accuracy, but also proves the necessary former existence of something not known, and that this necessary existence is later discovered, having the prescribed values, is of the nature of the strongest kind of proof possible in scientific work.

For example, in the mathematical-physics method of a Galileo, Descartes, Newton, Laplace, or Maxwell, it were impossible to have shown that such an orbit of a missing planet must necessarily have existed. This by itself is sufficient to prove, that although the mathematical method of these latter might be able to describe some features among observed astrophysical phenomena, that method is capable only of description of such phenomena, and is incapable of defining the lawful principles underlying such events. So, Gauss’s discovery that the new astronomical object, Pallas, was an asteroid of Kepler’s missing-planet orbit, not only discredited totally the contrary opinions of Galileo, Descartes, and Newton, but also proved that their method can tell us nothing, beyond mere partial description, of the lawful ordering of the universe. Des-



*The frequency values of these two basic series of musical tones are ordered according to the Golden Section.*

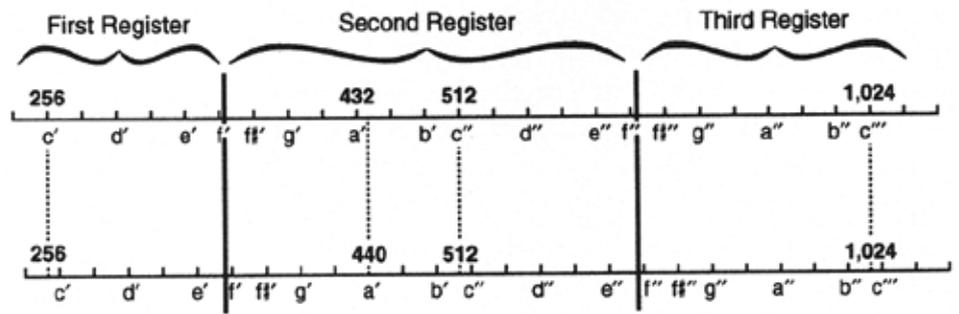
cartes’ and Newton’s method itself was thus proven empirically to be intrinsically unscientific.

The main line of development of German eighteenth and nineteenth century mathematics, is traced from Leonardo and Kepler, through Desargues, Fermat, Pascal, and Leibniz, through the 1794–1814 French École Polytechnique and the nineteenth-century collaborators and successors of Gauss. (The contrary line of development is essentially Descartes, Newton, Laplace, Cauchy, *et al.*, through Clausius, Kelvin, Helmholtz, Maxwell, *et al.*) We need only consider here the line leading into Gauss. It was on the basis of this line, and of the extended influence of Kepler’s work, that the well-tempered system of J. S. Bach was established.

As Kepler emphasized and elaborated repeatedly, the natural musical scale is based on the harmonic ordering which permeates and governs the laws of astrophysics. These are laws of the type established by Kepler, and not the supposed laws of a Cartesian discrete manifold. For example, Helmholtz demonstrates his utter incompetence, when he insists on the direct opposite. Whereas Kepler proved, in fact, that the laws of astrophysics are the same as those harmonic laws governing living processes, Helmholtz insisted that the “natural” musical scale is one derived from the rectilinear pseudo-harmonics of non-living objects. Helmholtz’s scale might be consoling to such deluded rocks as might imagine themselves to be the self-evidently existing highest species of the universe, but only the well-tempered scale accords with the lawful ordering of the universe.

The fuller musical implications of this could not be adequately understood until Gauss enabled us to begin to understand the physical reasons for the shift of register in the soprano voice, in passing from F to F-sharp in a well-tempered scale with A at between such approximate values as 427 and 432. To understand what this empirical fact means, we must master Gauss’s elabora-

tion of the arithmetic-geometric mean. The practical significance of the role of the arithmetic-geometric mean in soprano register-passage, is first, that the physics of the well-tempered scale requires that this occur at precisely that place in the scale; conversely, the well-tempered scale is properly set to fit F-sharp to that soprano register-shift.



*At A = 432 or below (top scale), the soprano register shift occurs between F and F#; at A = 440 or above (bottom scale), it is forced downward to between E and F, thus changing the musical meaning of a Classical song in a way contrary to the composer's intention.*

The relative significance of middle-C, is that none of the note-intervals between middle-C and C above middle-C are defined in terms of powers of 2. Although there is an attempt to do this in using the equal-tempered scale as a rough approximation for well-tempered, the equal-tempered and well-tempered intervals are not the same. Agreed, the corresponding notes in different octaves are nominally simple multiples of one another, but the absolute values of all of those tones are values of complex functions, whereas only the C's of the octaves are definable as values of linear functions (i.e., correspond to ephemeral values at which the "imaginary" component of the variable is ostensibly zeroed).

Voice-singing is the basis for all Classical musical composition, and the conceptual basis for instrumental performance. Instruments were designed to fit the well-tempered requirements and register-passage of the human singing voice, taking into account such facts, as that it is impossible to sing a Classical song or choral work correctly at A=440, and absolutely not at A=450—at least not without torturing and prematurely ruining the singer's voice. Faced with A=440, the soprano would naturally pass on the F, rather than the F-sharp, thus changing the musical meaning of a Classical song in a way contrary to the composer's intention.

When the F-sharp soprano passage was allowed, and not allowed, at various points in the history of European music, is not yet determined satisfactorily. Some medieval superstition cooked up the notion that the C/F-sharp interval was "the devil's interval," and that interval was therefore something that neck-wary composers and performers might wish to avoid. The composer so influenced would be obliged, reaching the F, to leap over the F-sharp, to reach the soprano's second register on the G, for example. (Mozart was apparently

the one to free music from the last vestiges of the influence of such horror of "the devil's interval.") Such shibboleths are what they are, and their unfortunate history has no bearing on the appropriateness of the musical-scientific significance of the F-sharp passing.

The Classical composer's song, in particular, is written in such a way, that each note lies within a definite singing register for the chosen singer (soprano, tenor, alto, baritone, bass), such as below, on, or above the F-sharp for the soprano. Thus, we cannot transpose such a song arbitrarily from one key to the next, without destroying the song's performance in most cases. The way in which a voice-register shift divides a completed thematic statement (musical equivalent of a poetic line or couplet), is an integral musical part of that statement. To shift key-signature freely, by transposition, in one case out of ten, changes the location of that division of the thematic statement, such that it is not the same thematic statement as the original.

True, we can transpose from the soprano to baritone voice, such that the baritone singer's thematic statement divides the statement in the same way as the soprano's, but in a different key. However, this, although satisfactory for the baritone's own part, imposes errors upon the part of the keyboard instrumental or orchestral accompaniment.

The conventions of Classical composition, including choice of key-signature, are derived from this feature of composing for the human singing voice. Apart from the important distinction between minor and major keys, the leading significance of a composer's choice of key-signature, is that it represents a different division of the thematic statements in respect to singing-voice registration than were the composition quoted in C major or C minor.

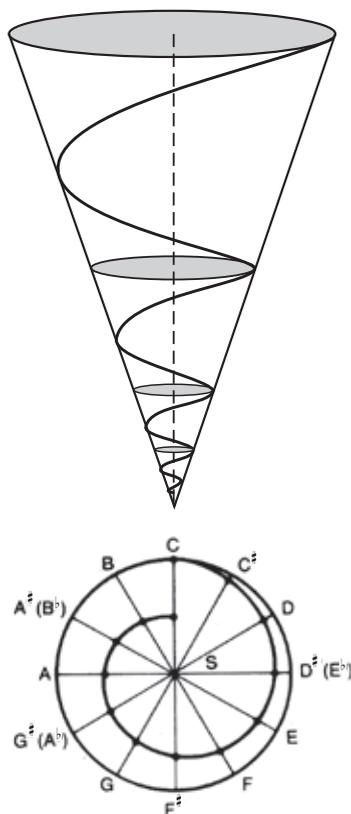
This carried over into construction of eighteenth

and early nineteenth century keyboard instruments, which tended to be built to shift register in congruence with the singing voice, and so forth and so on. The point stressed, is that instrumental composition was based on the implications of singing-voice register. This is significant to such effect, that orchestral performances of Mozart and Beethoven cannot be accomplished with strict musical competence using modern instruments. The same is true for keyboard performances of Mozart, Beethoven, Schubert, Chopin, Mendelssohn, Schumann, *et al.* Their keyboard compositions were written for the characteristics, including those of registration, of the instruments for which they composed, such as the fortepiano. The modern pianoforte intentionally eliminates those characteristics, to such degree that muscular tricks and otherwise exotic procedures might be employed in a not really successful attempt to replicate the composer's intent.

Before turning to Kant and Romanticism, one additional point should be stressed.

The unit event in musical composition, is not the individual tone, but rather the intervals connecting tones. The musical aspect of a composition lies between the notes, not on them. What the performer must do with the individual tones, is to construct the interval associated with those tones in the intended fashion.

It is a related point, that, strictly speaking, instrumental and orchestral chords do not exist in music, at least not as self-evident species of isolated events. Did you ever know a singer who could sing a chord, except as an arpeggio? A chord is a chorus of individual voices, which defines implicitly a corresponding number of singing voices in the composition. It is the intervals defined by the progression of the singing voices which is primary, and the existence of a particular chord merely something which reflects such movements of intervals



*A self-similar, or logarithmic spiral on a cone, projected onto the cone's base. The result is a mapping of the well-tempered, twelve-tone musical scale.*

among the voices of the chorale.

A contrary view has been fostered, by aid of emphasis upon a musical misunderstanding of the pianoforte, and the delusion that what might thus be demonstrated from the standpoint of the misguided instrumentalist, is an adequate standpoint from which to demonstrate musical principles empirically. Contrary to popular impression, keyboard instruments are to be played as either orchestras, chamber ensembles, or choruses, or some combination of these. To do this requires much more physical skill, as well as musical insight, than is displayed by the "Klitschklinger," but such are the penalties of becoming a serious keyboard performer.

All these musical considerations have a precise, electrodynamic significance in Gaussian physics. Gaussian physics is based on geometrical constructions

rooted in a conic self-similar-spiral form of action. For example, one octave corresponds to a single complete turn of the spiral around the cone. So, if we draw the proper choice of line along the side of the spiral, this will intersect all of the C's, another the D's, and so on.

Construct a self-similar spiral on a cone. At 360 degrees of rotation of the spiral around the cone, mark a point, and draw a line along the outer surface of the cone, from the apex through this point. All the tones which lie upon the intersection of this line with the spiral, are C's of the relevant octave. Now, locate the complex-value points of the F and F♯, and proceed similarly for each. Using the same method, as for the octave, define the E-flat, and, relative to the G, the E. And so on.

The result is the well-tempered, twelve-tone scale. All musical tones lie precisely on these values, and none possible in between. In other words, if one defines the audible spectrum, from approximately 16 cycles upward, we have the following result. At each point a

well-tempered tone appears in this spectrum as a whole, there is a spike in the graph. These spikes, like discontinuities in the continuum of continuously rising frequencies, have the mathematical-physics character of true physical singularities in Gauss-Riemann physical space-time. Musically, these spikes correspond to the spectroscopy of singing and hearing a well-tempered scale.

This spectroscopy, and other, related considerations, warn us that the teaching of an absolute, “perfect” well-tempered scale to young children, through solfège without the atrocity of “movable do,” ought to be regarded as an essential part of developing their musical intelligence. Placing the unique value of an interval, uniquely identified, in the mind, is so important a part of musical intelligence, that musical aptitude must be impaired without this training. It is to be stressed, that the comprehension of readily recognizable intervals, relative to a fixed absolute value of C, in this way, is the objective to be attained.

All harmonic intervals are thus represented by angles of rotation of the spiral, in moving from one note of the interval to the next. These representations are physically valid ones, which have a definite significance in Gaussian electrodynamics. This is most agreeable, since we know that sound is propagated electro-dynamically rather than in the usual sense of acoustics, but that is a subject in its own right.

Beauty, as Classical aesthetics since ancient Athens has defined it, is of forms rigorously defined by the fundamental, Keplerian laws of astrophysics, provided we qualify this by stating that Kepler provides the first approximation of this. So, the elementary principles of music, such as the well-tempered scale, and the notion of interval as primary, rather than individual tone, are absolute truths of the universe, which existed before the first musician other than the Creator Himself—putatively the stone-age composer, Ugh Wa Hoo.

This also signifies, that there are certain principles of musical composition which could not be violated, without making the result a relatively depraved or outrightly ugly one. This is no bar to creative originality in musical composition, as the traceable line of development from Bach, into the later compositions of Mozart, and the internal development within the successive phases of composing by Beethoven, suffice to illustrate the point. However, there is never anything arbitrary separating an innovation from the preceding level of

compositional practice. The lawfulness of music not only permits, but demands creative progress; however, each such innovation is shown to be a valid one as it enlarges the scope of musical laws without purporting to invalidate any of them.

As a matter of illustration of this point. Near the end of his life, J. S. Bach composed his *Musical Offering*, which became the point of reference for a series of Classical composers after him, notably Mozart, Beethoven, Schubert, and Chopin. This topic, as it appears in an ordered succession in the relevant compositions of Bach, Mozart, Beethoven, Schubert, and Chopin, describes a line of development, a series of successive musical discoveries based on Bach’s *Musical Offering* as the point of origin. All such works return to and reaffirm the original conception of Bach, which is provably a central conception of lawfulness of the twenty-four key well-tempered system. Yet, new dimensions of lawfulness are elaborated, as creative scientific discoveries, along the pathway.

This is what Kant set out to destroy.

### **The Philosophy of I. Kant**

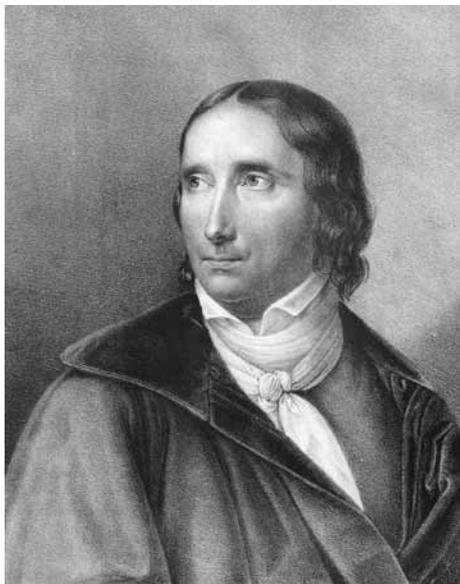
In his *Critique of Judgment*, Kant makes two principal, interrelated assertions. First, that the process by which the human mind effects original scientific discoveries, is not a kind of ordered process knowable to the conscious human mind. Second, for kindred reasons, Kant asserts that there are no knowable principles governing the ordering of creative artistic composition, which might be knowable to the conscious human mind. To this second point, Kant appends the axiom of nineteenth-century German Romanticism, that there are no rational criteria of truth or beauty in aesthetics, that what is deemed pleasurable in aesthetics is, from the standpoint of scientific method, an arbitrary whim of the *Zeitgeist*—“If art is popular with those social strata which are putatively the arbiters of good taste, it is true art for that time.”

This was later carried to an extreme by Hegel’s accomplice at Berlin, professor of law F. Carl Savigny.

Savigny is significant in law on three counts. First, that he adopted Roman imperial law, and demanded the eradication of the natural law traditional to western European civilization since St. Augustine, the natural law upon which the U.S. Declaration of Independence and Federal Constitution were premised. Second, he reconciled the model of Roman Law with the arbitrary hedo-



Steel engraving by J.L. Raab, 1781, after a painting by Döbler



*Immanuel Kant's assertion that there are no knowable principles governing the ordering of creative artistic composition, and therefore no rational criteria of truth or beauty in aesthetics, was later carried to the extreme by F. Carl Savigny (right).*

nistic irrationalism of the Franco-Swiss Romanticism of Rousseau, Robespierre, de Stael, *et al.*, then being introduced to Germany. Third, Savigny has been the single most influential influence in corrupting the law practice of western Europe and the Americas over the course of the past century and a half.

In that context, Savigny decreed that in art, religion, and statecraft, no rational principle corresponding to the notion of science was tolerable. Hence, he decreed the hermetic separation of *Naturwissenschaft* (natural science) from *Geisteswissenschaft* (matters pertaining to human nature).

Before continuing with Savigny's dogmas and their influence on art, we must interpolate some observations on this separation of natural science from the study of human behavior. There are two aspects of this to be considered. The first is more readily accessible to the reader; the second is more profound.

Human existence has two empirical aspects, the existence of the individual within society, and the existence of society in the large over successive generations. To sort this out, we must begin with the existence of society, and then locate the individual within society. This suffices to demonstrate how the laws of natural science measure the behavior of the human mind.

The existence of society over successive generations, is a matter of the difference between successful

reproduction of that society, and failure. Successful existence of society is immediately a matter of production of those physical changes in the state of nature essential to successful maintenance of present and later generations. This cannot be successful for very long without technological progress. All societies which have systematically avoided technological progress, such as the two Roman empires, western and eastern, have undergone an internal collapse of production and population-levels, leading to their collapse and even, in some cases, to extended periods of cultural

degeneracy of the survivors, as in the instance of degenerated societies often mistakenly called "primitive."

Man acts upon nature so, and nature responds so. This cause-effect relationship is a matter of physical laws. So, the question of human behavior becomes a matter of the appropriateness of the development of policies and thought of societies to the physical laws to which the success of society's reproduction of itself is subject. A process of development of opinion, which is out of correspondence with this implication of physical laws, defines an insane society, which must be so judged by these objective standards.

The question of the relative sanity or insanity of entire societies, so situated, is a question of its culture, the way the society thinks, and reaches policy-decisions governing its practice. How the society behaves in every respect, is a reflection of those same criteria of judgment employed to develop policies pertaining to the society's biological reproduction over successive generations. It is those same criteria of judgment which determine the society's preferences in such included matters as jurisprudence, structure of political institutions, and art.

The actual development of society, as scientific and technological progress illustrate such development, originates in the creative mental powers of the individual member of society. Although the society fosters the development of such individual potentialities, and pre-

conditions the means upon which individual creative activity draws, the act of creativity is an individual's action. So, the creative individual is indispensable to the successfully perpetuated existence of society, and the creative individual's development is dependent upon the society and its development in the large.

So, the macrocosm, the society in the large, and the microcosm, the individual member of the society, are interrelated to form a single subsuming function. So, the larger macrocosm, the universe, is interdependent with the relative microcosm, the society, and so also the individual with the universe. So, the microcosm, the current state of the universe, is interrelated to the macrocosm, the subsuming, continuing process of creation, and so the individual with the continuing process of creation.

Just as the society's behavioral dispositions must be appropriate to the physical function upon which depends the society's biological existence, so the individual's contribution is dependent upon the same kind of sanity which the society as a whole requires. If the underlying assumptions of individual judgment are skewed relative to physical laws, as Kepler implicitly defines the proper meaning of "physical law," then the individual is relatively insane. The development of society depends upon the production of sane individuals, who are sane in this specific sense.

Hence, the attempt to separate *Naturwissenschaft* from *Geisteswissenschaft* is not merely absurd, but morally insane and destructive of the society. The very idea of effecting such a separation, as a prevailing policy of practice in the society, dooms that society to extinction if such a recommendation is continued for long enough.

Contrary to the delusions of many, the human mind cannot be neatly separated into departments such as music, personal life, science, public policy, and so forth. The human mind is a unity, such that the ontological and methodological assumptions affecting one facet of experience permeate all. If these ontological and methodological assumptions are defective, even though the victim be more or less unaware of the existence of such assumptions, the entire mind is defective. One cannot be defective in musical disposition, without this being reflected in various ways in all aspects of one's personal behavior.

Hence, if one's view of something so intimate as music is an irrationalist one, then one's view of everything is tainted by a specific color of insanity.

This brings us to the more profound consideration, bearing on the proper definition of "physical science." Here, we address the core of the issue between the eighteenth-century Christian theologians and the so-called "materialist enlightenment." Is the fault, that the "materialists" purported to explain everything "scientifically," as poorly informed theologians have argued, or is the fault that the Cartesian standpoint in scientific work is not only fatally flawed, but contrary in implications to the requirements of a sane society?

For most people, the name of "mathematical physics" today is associated with a kind of deductive logic analogous to what used to be the commonplace, school-book Euclidean geometry taught in secondary schools. A system of axioms and postulates is adopted, and everything else in that logical system is constructed by means of formal-logical deduction. Taught higher mathematics, and mathematical physics today, are strictly derivatives of that kind of formal-logical deduction. Insofar as Kant or Savigny might assert that that sort of mathematical physics was incompetent respecting subjects of human behavior, the assertion appears to be a defensible one.

The notion of physics accessible to such a deductive form of mathematics is a derivative of the system of Descartes. This is known to Classical scientific literature as the representation of the physical universe as contained entirely within a "Cartesian manifold." Or, we are more likely to say today, a "discrete manifold." In a "discrete manifold," the existence of either living processes or the astrophysics of Kepler, is impossible. Since mathematicians do exist as living processes, their mere existence suffices to prove the incompetence of their advocacy of such methods in mathematical physics.

The question of the functional relationship of physical science to *Geisteswissenschaft*, is a matter of defining physical science's method in an adequate way, a way free of the axiomatic absurdities of formal-logical deduction and the "discrete manifold." We must proceed as Kepler did, to premise the fundamental laws of the universe on the elementary empirical fact that living processes, including mankind, exist within that universe.

Therein we see the gross error of assumption underlying the Cartesian "Enlightenment."

The really existing universe requires a kind of mathematics opposite to the formal deductive method. This needed mathematics is that of Cusa, Leonardo, Kepler,

Leibniz, and Gauss. This is a mathematics based on a “non-Euclidean geometry,” a geometry which prohibits use of axioms, postulates, and formal-deductive method. This is called variously a “synthetic geometry” or a “constructive geometry.” For emphasis, we might say, a “radically constructive geometry,” prohibiting methods borrowed from formal-logical deduction or any other consideration external to a self-contained process of derivation solely by construction, starting with circular (isoperimetric) action as the only self-evident form of physical existence.

Circular (isoperimetric) action is not a sufficiently developed notion of circular action. Action does not occur within Euclidean space, but rather in a matter-space-time continuum, such that neither matter, space, nor time can be meaningful conceived apart from inseparable unity with the other two. The fact that development occurs in the universe, suffices to demonstrate that the universe is expanding in this sense. Thus, the least action occurring in a matter-space-time continuum is, rather than simply circular isoperimetric least action, of the form of an expanding conic, self-similar-spiral action, in which the measure of “action” is development.

The characteristic projection of such conic self-similar spiral action upon the discrete manifold of ordinary perception is harmonic orderings congruent with the Golden Section. So, from the standpoint of Kant’s avowed adversary, Gauss, we understand Kepler’s hypothesis in the proper frame of reference today.

The conflict between the Cartesian and Gaussian forms of mathematical physics is commonly expressed by the formalist’s insistence that the universe as a whole is entropic, winding down in the sense of a mechanical time-piece. In the physics of Kepler and Gauss-Riemann, the universe is elementarily negentropic, developing to ever higher ordered states of existence, as well-tempered Classical polyphony demonstrates such a principle of the human creative mental faculties.

The source of this difference is not physical evidence as such. The source is two opposing interpretations of the physical evidence, the effect of superimposing either the formal-deductive or constructive-geometric forms of mathematical comprehension upon the way in which the physical evidence is selected, arranged, and represented. The argument that the physical evidence suggests universal entropy, is not based on the physical evidence as such, but the deductive mathematician’s

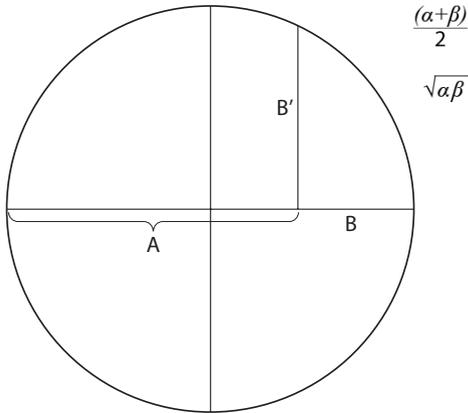
misrepresentation of that evidence.

Commonly, when this observation is presented, someone asks, “Explain that to me.” It soon appears, that what is requested is the explanation of a synthetic-geometrical proof by construction in the language and methodology of a formal deductive mathematics! The habit of thinking that proof must be clear in terms of reference of a deductive analysis of the discrete manifold, is so strongly conditioned that even once the falsity of the deductive method is conclusively demonstrated, the former university student demands that that be proven within the range of terms allowed by—deductive analysis of the discrete manifold!

Perhaps, it is impossible for all but the rarest few to grasp the methodological implications of such refutations of deductive method, until they themselves have reworked their mathematics education, by working their way through Kepler, and accompanying this with progress to the rudiments of Gauss’s mathematics by way of working through texts such as Jacob Steiner’s (elementary) *Synthetic Geometry*. Their proper response should be, not “Explain this to me,” in deductive terms, as they usually do, but rather, “What program of study must I go through, to clear the cobwebs of deductive thinking from my habits of thought?”

In matters of logic, Savigny was a slob. The fact that the fanatically deductive Kant is the source of formal authority for the assertions of Hegel and Savigny, comes to our assistance. Kant’s premise for denying that an ordering of creative discovery is knowable to human consciousness, is nothing more than the fact that negentropy does not exist in any possible deductive representation of a discrete manifold.

Contrary to Kant’s cited first assertion, from the *Critique of Judgment*, it is possible to be conscious of an ordered process of reasoning underlying every valid sort of creative discovery. This is demonstrated by Bernhard Riemann’s extension of Gaussian mathematics of physical space-time, as is already indicated as to principle, although only in a preliminary way there, in Riemann’s 1854 “On The Hypotheses Which Underlie Geometry.” We have already indicated here, as in various locations published earlier, that the rigorous determination of aesthetical values, as to form, is subsumed by the Gauss-Riemann mathematics of physical space-time, as the Golden Section’s generation of a characteristic of living processes images in the discrete visual field is determined in this way.



All living processes are characterized by an harmonic ordering of growth congruent with the Golden Section. Shown right: A cross-section of a nautilus shell.

The problem is, that our educational systems have failed to make clear the fact that what we see as visual space, is not the real universe, but only a projection of that real universe on a three-dimensional screen. So, inadequately educated persons demand that the definitions of laws of the physical universe be limited to explaining how one mere shadow of reality causes changes in another mere shadow of reality. This is to stress, that what we ought to mean by “laws of the universe” do not lie within the mere shadow-world of sense-perception, but in the higher world which generates as reality what our senses see as mere shadows.

There is more. Insofar as we think of laws as something like the so-called Laws of Newton, or even a merely algebraic interpretation of Kepler’s Laws, these kinds of apparent laws are not permanent, but are themselves subject to change. The real laws of the universe are those which govern which possible changes in locally apparent laws may occur. We sometimes describe this higher order of ontological reality, and its higher laws, as the “transfinite.”

This higher domain of Gauss-Riemann physical space-time is not a mystical, merely abstract existence. Rather, it is the primary location of what is ontologically real; it is the world of inadequately educated persons’ sense-certainty, which is the merely abstract, the mere shadow-world. However, it is necessary to develop one’s mind in an adequate degree, in the proper direction, to be able to comprehend this, as one learns to comprehend anything worth learning.

Thus, what we have identified as the specific, characteristic feature of the incompetence of deductive

physics is the sophistry, mere cant employed by Kant *et al.* to say “I can’t” think creatively. On this profession of Kant’s own incompetence in physics, hangs the entirety of Savigny’s dogma of hermetic separation of *Naturwissenschaft* from *Geisteswissenschaft*.

Although most musicologists are as ignorant of Kant’s and Savigny’s specific influence, as the poor savage is of the

nature of the cholera infection he is suffering, the professional musician’s ignorance of the connection does not make the infection less infectious, less disastrous, less real.

It was out of Kant’s and Savigny’s influence, that political actions were taken to cause the spread of the Romantic fads in music, including the shift in pitch from C=256 to the Russian unmusicalities of A placed between 440 and 450. From this source came the delusion so popular among professionally miseducated musicians today, that the principles of music are limited to what modern opinion sees as passed down within the hermetic framework of “art for art’s sake,” “music as a secretion peculiar to professional musicians,” or the insanity of the search for “absolute music.”

In place of rationality in aesthetics, Kant substituted the irrationality of changes in popular tastes. Savigny generalized this for all aspects of *Geisteswissenschaft*, to locate the authority for legal opinion in a capricious *Volkgeist* (popular opinion), a more brutishly irrationalist form of Hegel’s *Weltgeist*. To be more precise, Savigny located the discernment of the current moods of the *Volkgeist* as a faculty of the arbiters of popular opinion. In effect, in art, some current fad is a new form of art, superseding earlier standards of composition and performance, merely because the arbiters of popular taste decree it to be in vogue.

Once this rabid irrationalism is tolerated, the study of music is degraded to efforts to define common threads among Classical composition and the sundry Romanticist and Modernist fads which had been heaped like manure upon the Classical since the po-

litically motivated ukases of the 1815 Congress of Vienna. That which implies that Wagner is intrinsically bad, as Classical standards require such judgment, is said by some to be “wrong,” because Wagnerian Romanticism was decreed among the accepted phases of the *Volkgeist*’s tastes in music. A=440 is acceptable, because prevailing taste accepts it. A=450 is also acceptable if musical taste decree this, too. Voice register is outlawed, if the arbiters say that register does not exist, but merely resonance. And so on and so forth.

This reached its natural culmination in the Nazi doctrine of *Volkgeist*, the “Triumph of the Racial Will,” itself a direct copy of Dostoevsky’s dogma of the collective Russian will of those of the “sacred blood and soil of Holy Mother Russia.” It is naturally the dogma of fascists, as Arturo Toscanini was in musical fact, and of Russians and Marxists generally. What is called preferred musicological dogma today, is simply fascism, as Heinrich Heine foresaw the fascistic implications of Kantian influence in his own *Religion and Philosophy in Germany*.

It is notable that this same *Volkgeist* dogma is the essential feature of the existentialism of Nazi sympathizers Carl Jung, Martin Heidegger, and Karl Jaspers,

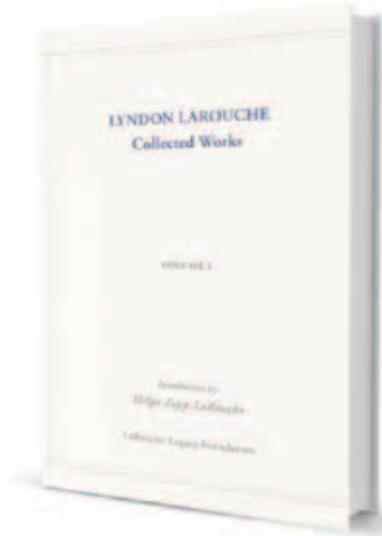
as expressed by the anti-Catholic heresy of Tübingen’s late Karl Rahner and the “Liberation Theology” movement. The radicals’ preference for the horizontal “people’s church” of totalitarian Nicaragua, over the “verticalism” of the Papal leadership of the bishops, is precisely the same thing as Kant and Savigny—and both Stalin and Hitler, who differed essentially only racially, in that the one was a Georgian super-Muscovite and the latter an Austrian theosophist.

Nonetheless, although the greater part of musical theory taught in professional schools today, is mere brutish irrationalism designed to confuse and thus destroy the minds of the music student, the fact that this indoctrination is consistent with the intrinsic irrationalism of Liberalism generally, and American pragmatism more immediately, is cause for the credulous music student to find nothing wrong in the irrational dogmas of the academic instructor. Irrationalism of this sort, has been made to seem “common sense,” and thus the student is insensible of the fact he is being subjected to a hoax when he encounters the same kinds of explication in the teaching of musicology.

Such is the moral depravity and anti-scientific irrationalism which has come to be generally tolerated in this decadent age.

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