The Classical Idea: Natural and Artistic Beauty

by Lyndon H. LaRouche, Jr.

The strict usage of the term "classic" within the modern Western European tradition arises from former policies of education which placed the emphasis upon the Greek and Latin classics. "Classic" values signified reference to the idea of beauty associated with ancient, "classical" Athens. The models of the "classical" notion of beauty were centered around the image of the design of the Athens Acropolis and the expositions on the interrelatedness of the Good and the Beautiful found as central features of the dialogues of Plato (428-348 B.C.).[1]

The strict Classical Idea was established in the Western European tradition through the influence of the writings of St. Augustine (354-430), including his *De Musica.* The relationship between Platonic notions of the Good and the Beautiful, and Augustinian Christian standards, was defined by St. Augustine in a famous letter citing the coincidence and differences between his outlook and that of Plato.[2] The application of Augustinian principles of harmonic beauty by the twelfth- to thirteenth-century cathedral-building school of Chartres in France, is an outstanding example of the pre-Renaissance notion of application of the Classical Idea.

Provided we take those ancient Greek and medieval aspects of the matter into historical reference, the modern form of the Western European Classical Idea is associated with the Renaissance, including the influential work of Dante Alighieri (1265-1321) and such followers as Francesco Petrarca (1304-1374), but otherwise emphasizing the fifteenth-century and early sixteenth-century work of the Golden Renaissance, as typified by the influence of Cardinal Nicolaus of Cusa (1401-1464), Luca Pacioli (c.1445-c.1517), Leonardo da Vinci (1452-1519), Erasmus of Rotterdam (1469-1536), and Raphael (1483-1520).

In Western Europe, to the present day, the Renaissance expression of the Classical Idea was also generally known by the name of "humanism." Unfortunately, in the English usages of this century, the term "humanism" has been stolen by the Ethical Union and its co-thinkers;

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their "secular humanism" signifies an outgrowth of modern liberalism which is directly opposite to classical humanism in every sense. So, today, we are obliged to say "classical humanism," or "Christian humanism," to show that we mean something directly opposite to what popular opinion today knows as "secular humanism."

Renaissance humanism, as typified by its principal authority, Nicolaus of Cusa, signified, among other things, that there is nothing in the universe of human experience which is not potentially intelligible to an individual human mind, nothing which is not potentially susceptible of intelligible representation in the strictest sense of intelligible scientific representation.

On that point, Nicolaus of Cusa and Plato agreed. For classical Athens, beauty was not a mere matter of differing tastes; the quality of being beautiful, or ugly, is a decision subject to rigorous scientific verification. The Golden Renaissance, especially through the Milan collaboration between Luca Pacioli and Leonardo, reconstructed rigorous geometrical proof of this classical Greek principle. From the spread of the influence of this proof, there developed what we rightly identify as the modern Classical forms of music, painting, architecture, drama, and poetry.

The Classical Composers

By Classical music, we signify the work of a series of eighteenth- and nineteenth-century composers, beginning with Johann Sebastian Bach's (1685-1750) establishment of the well-tempered system of polyphony, and continuing through paragons such as Wolfgang Mozart (1756-1791), Beethoven (1770-1827), Schubert (1797-1828), Mendelssohn (1809-1847), Chopin (1810-1849), Schumann (1810-1856), and Brahms (1833-1897), through the 1890's.

We should also include those predecessors of Bach, including his immediate musical ancestors of the seventeenth century, who, from the time of Leonardo da Vinci, fought to establish a Classical music based on perfection of an effort aimed at producing a well-tempered system. We must also include the known history of what we call today the *bel canto* method of voice-training and singing.

Stone sculptures of singers from the fifteenth century demonstrate conclusively that the *bel canto* system was fully developed at that time, and doubtless earlier (SEE Figure 1).

We must distinguish between the musicians in this Classical tradition, and those composers among their contemporaries who fought to eliminate the Classical tradition. Claudio Monteverdi (1567-1643) was such an anti-Classical composer, whose approach to composition and choice of musical themes prefigures the nineteenth-century Romanticism of Liszt (1811-1886) and Wagner (1813-1883). The nineteenth-century Romantic composers lived and worked during the same time as the Classical tradition was practiced by such exponents of the Classical tradition as Mendelssohn, Chopin, Schumann, Verdi, and Brahms.

During the period of Bach's last years at Leipzig (Bach served as cantor of St. Thomas's school and music director in Leipzig from 1723 to 1750), the House of Hanover and other elements of a faction then known as "the Venetian Party"[3] sought to obliterate Bach's music and influence from the memory of mankind, to the effect that Bach's compositions were not permitted to be performed in European concert halls until Felix Mendelssohn broke the ban, by performing Bach's *St. Matthew Passion* at Berlin, in 1829. Against Bach, the Hanoverian faction held up as a model the trivial figure of Rameau (1683-1764).

Despite the ban against the performance of Bach's compositions during the period from approximately 1750 until Mendelssohn's famous 1829 concert, Bach shaped the development of the Classical field. Beethoven virtually teethed upon Bach's "Well-Tempered Clavier," under the instruction of one of Bach's leading students, Christian Gottlob Neefe (1748-1798).

Wolfgang Mozart underwent a revolution in the profundity and power of his composing after 1782 studies of Bach's work. Although the powerful Venetian faction had banned Bach's music from the concert stage, Mozart and Beethoven defined Classical composition on the basis of their own studies and use of Bach's discoveries.

The influence of Marxist and kindred social theories of art among musicologists and others, has produced the popularization of a doctrine to the effect, that modern composers belong to successive periods of musical mannerisms and tastes, such as the Baroque, Rococco, Classic, Romantic, and Modernist. The spread of this social theory has been perhaps the chief reason the majority of modern professional musicians no longer grasp some among the most rudimentary features of principles of classical musical composition.

It is usually assumed that the "Romantic Period" erupted on the European continent during the period of the 1815 Treaty of Vienna and the anti-Classical Carlsbad Decrees. For that reason, all leading composers after 1827-1828 are not only classed as representatives of the Romantic Period; in most instances of what passes for standards of performance of the musical repertoire today, the works of strictly "Bachian" composers such as Schubert, Mendelssohn, Chopin, Schumann, and

Brahms are interpreted in a way more or less appropriate for Berlioz (1803-1869), Liszt (1811-1886), Wagner (1813-1883), and Hugo Wolf (1860-1903).

The cleanliness, meticulous shaping of tone, "long-line" phrasing, and contrapuntal voice transparency, essential for the classical composition, are more or less abandoned, and the performance inundated with thick blobs of sentiment and Romantic mannerism instead.

So, the historical fact is, that during the entire period from the time of Leonardo da Vinci through the death of Brahms, composers, performers, and musicologists committed to the Classical Idea in music constituted a more or less widespread and powerful faction within music. During this span of time, there were no distinct periods of such a nature that some ruling Hegelian sort of musical spirit of the age—an Hegelian *Weltgeist* or Savigny *Zeitgeist*—was a characteristic feature of the work of the musicians generally.

To the degree there might seem to be any justification at all in use of terms such as a Baroque, Classic, Romantic, or Modernist "Period," this merely signifies that one of the contending political factions within music enjoyed the upper hand in terms of backing by powerful patrons. The hegemony of the "Bachians," such as Mozart and Beethoven, during the 1763-1815 period of the rising influence of the American Revolution upon Europe, represented the Classical faction in music at the relative peak of its political power. The Romantic movement in music derived its power from the anti-American forces at the center of the Holy Alliance.

The same is true of other aspects of the fine arts, including painting, architecture, drama, and poetry. The increasing patronage of Romanticism and, later, Modernism, is associated with a rise of irrationalism in political movements as well as in artistic fields. As the political power of wealthy patrons of these irrationalist movements in art was increased, and as irrationalist radicalism was spread more and more throughout the populations, the representation of the Classical musical composer on the concert stage, and in the teaching institutions, was diminished. Although works from the Classical repertoire continued to be performed, the standard interpretation of those works was shifted in a way more or less satisfactory to the sentimental, anti-polyphonic irrationalism of, initially, the Romantics, and, more recently, the Modernists.

The means by which Classical music was so undermined were purely political ones, such as the shift from the well-tempered C=256 Hz to the Russian bandmasters' A=440 Hz, decreed as a purely political decision during the 1815 Congress of Vienna. At the same time that the Romanticism of Liszt and Wagner was promoted against Beethoven's influence, there were also direct efforts to obliterate those strict standards of tuning and vocal registration the which lie at the center of the methods of Classical composition and performance.

In the effort to destroy the tradition of Classical music from within, three chief lines of attack were chosen. The first, was a direct attack on well-tempered harmonics, by aid of introduction of "elevated pitch," beginning with the political decrees demanding that C=256 be replaced by A=440. The second was the imposition of new standards for construction of the musical instruments. The third, was a manifold attack upon principles of *bel canto* singing. That threefold attack has become more or less successful, at least to the extent that the Classical standards and principles in these matters are the knowledge of but a tiny minority among professional musicians and music curricula today.

Natural and Artistic Beauty

Classical Aesthetics is centered around strict definitions of what ought to be intended by use of the terms "natural beauty" and "artistic beauty."

By *natural beauty,* we mean the principles of beautiful forms as they occur in nature. In music, this includes the well-tempered system of polyphony, which has been discovered by man, but which was created entirely by nature, not the artificial whims of musicians. We include as *natural beauty* the potentialities of the *bel canto* singing voice.

By *artistic beauty,* we mean an artistic composition which never violates the principles of *natural* beauty, but which adds a new dimension of beauty, produced by the creative mental powers of the individual mind of man.

In Classical Aesthetics, we insist that the quality of beauty—both *natural* and *artistic*—is not a matter of taste. The statement, "Well, in my opinion, it is beautiful, and my opinion is just as right for me as someone else's taste is for them," is not tolerated. There must be an absolute, scientific proof, that one principle of artistic composition is consistent with the quality of beauty, and that a contrary view is scientifically wrong.

The best exponents and examples of classical Athenian culture, already demonstrate a clear understanding of this point. They recognized that there is an absolute standard of beauty, by which we are permitted, and implicitly obliged, to say that one thing is beautiful, and a contrary thing called art, ugly. They struck upon the right approach to discovering that standard, a standard which can be demonstrated with scientific certainty, to the effect that we can show not only whether one person's idea of beauty is right, or not, but that a contrary

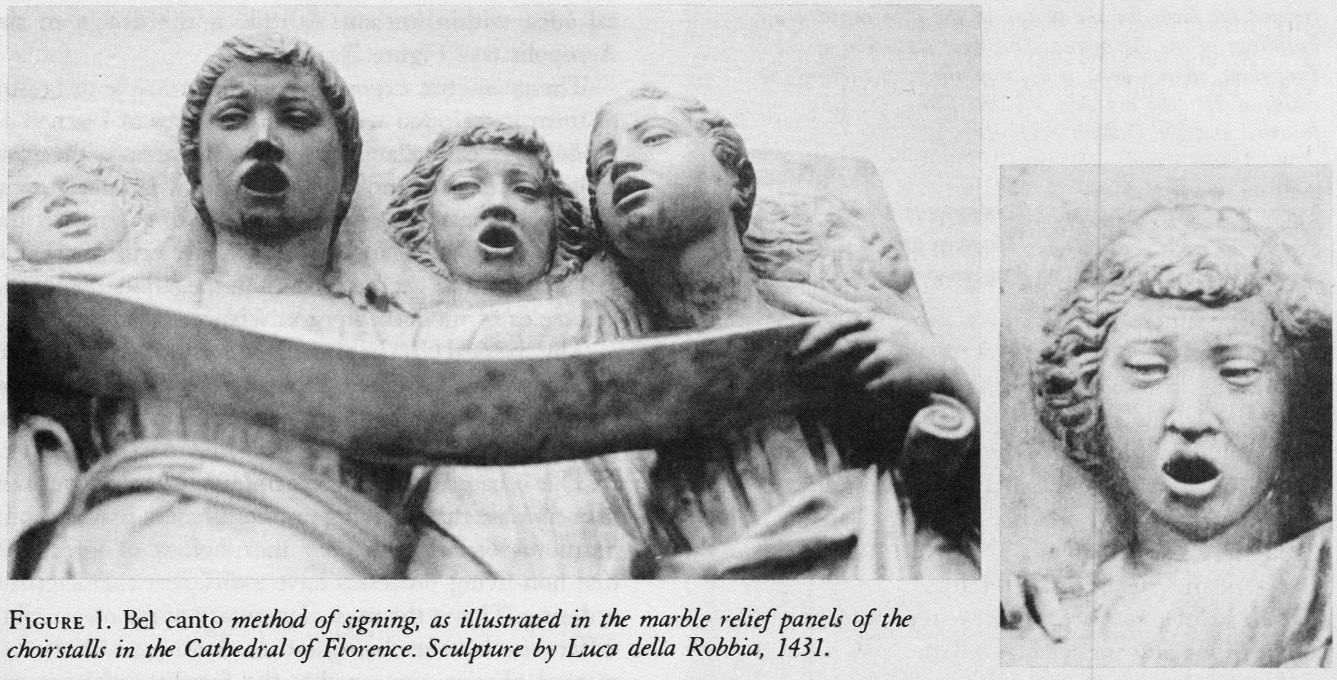


FIGURE 1. Bel canto *method of signing, as illustrated in the marble relief panels of the choirstalls in the Cathedral of Florence. Sculpture by Luca della Robbia, 1431.*

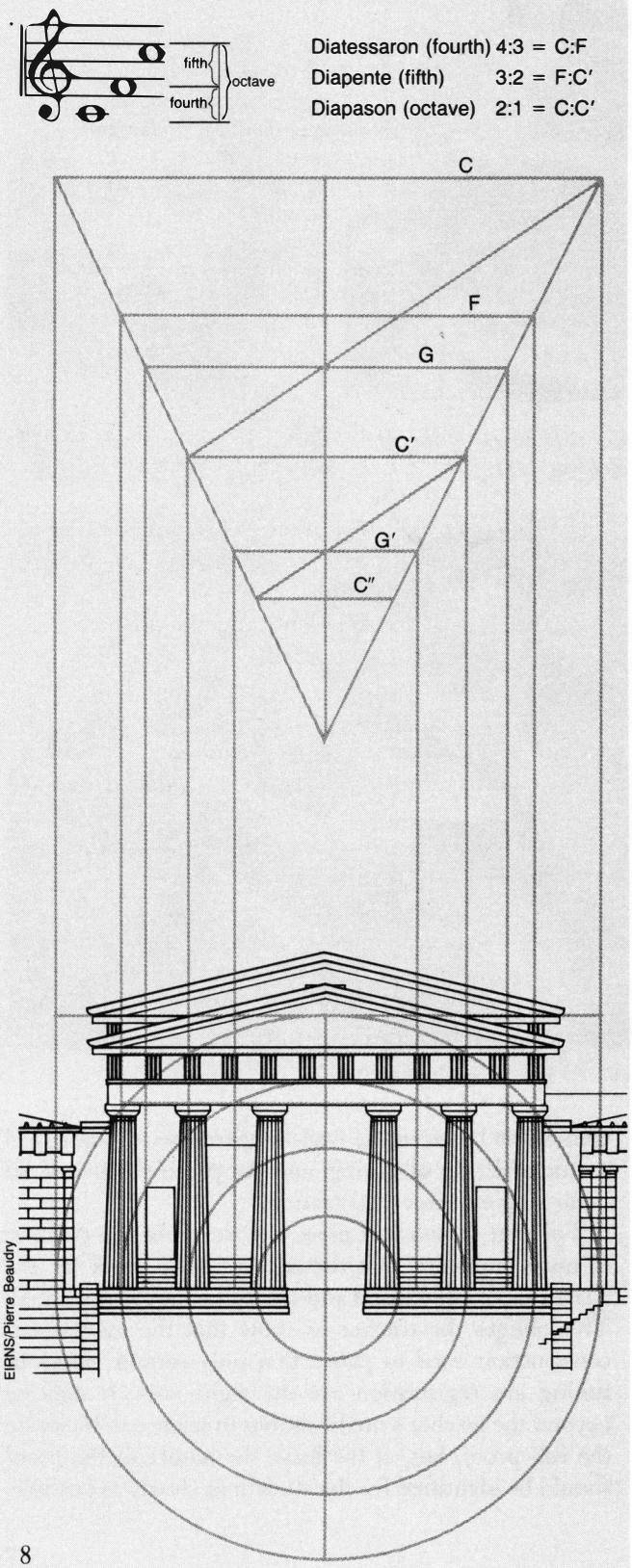
opinion is wrong.

The classical Athenians already understood, with fair accuracy, that this scientific proof is based on a certain kind of use of a special kind of geometric construction, a form of mathematical practice sometimes identified as "synthetic geometry." In other words, the proof of the quality of beauty is a measurable proof, provided we first understand the special principles of measurement required.

Those principles of measurement are the foundation for the proof of the strict standards of the well-tempered system, and are also the basis for showing the necessary connection between the well-tempered system, as a harmonic ordering of tuning, and the precise values of *bel canto* singing-voice registration.

For that reason it is most important for the training of music students, that the nature of the proof for the Classical Idea of natural and artistic beauty be presented. This obliges the teacher to show that the methods of construction used to prove that only certain values of tuning are registration are the right ones. It may be beyond the teacher's qualifications in science to elaborate the full proof, but, at the least, the nature of the proof should be identified for the student as clearly as possible.

FIGURE 2. *The method of "synthetic geometry" formed the basis for the design of the fifth century* B.C. *buildings of the Acropolis. The west elevation of the Propylaia, shown here, is a composition of mixing the ratios of 2:1 (the octave), 3:2 (the fifth), 4:3 (the fourth), and the Golden Section.*



One of the clearest examples of the force of the Classical Idea within ancient Athens, is the design of the Acropolis (SEE Figure 2).

The geometric exposition of this principle of beauty of form is included within the dialogues of Plato. The modern exposition, and further development of the principle, is traced to the work of Pacioli, Leonardo, and their collaborators, a project based directly upon the discoveries of Nicolaus of Cusa in the field of what is called "synthetic geometry" and in the stipulation of the principles of modern physical science.

The classical Greeks already understood that the quality of beauty is located in that which represents the essential distinction between healthy forms of living processes and non-living objects.

This is based on the simple observation, a fact verified in every case, that all living processes have a characteristic harmonic ordering in their morphology of form, and that non-living processes have a different characteristic ordering. This is the most elementary of the measurable differences between living and dead processes. In mathematical physics, we say that the former orderings are characteristic of *negentropic* processes, and the latter of *entropic* ones.

Essentially, life is beautiful, and the quality of deadness in human existence is ugliness. The Athenians recognized that beauty of form is associated with certain harmonically ordered constructions based upon the sectioning of circular motion. In Plato's dialogues, it is emphasized that all beauty of form, including that of music, is congruent with harmonic orderings cohering with the Golden Section of circular motion.

Pacioli, Leonardo, and their collaborators demonstrated, that all healthy living processes have these distinctions. The morphology of growth of healthy living processes is congruent with an harmonic ordering consistent with the Golden Section; the bodily functions of motion are also congruent with the same harmonic ordering. Work over the centuries since Pacioli's famous *De Divina Proportione* (1508), has strengthened the evidence in support of this proof.

These principles, taken together with the methods of scientific thinking earlier elaborated by Cusa, were the basis for Leonardo da Vinci's encompassing genius in the physical sciences and as a scientific pioneer in painting, sculpture, architecture, and music. One of the principal outgrowths of this accomplishment was the school of Raphael.

Between the period of Plato's Athens and the fifteenth-century Renaissance, the well-tempered musical system of Athens was carried a step further, by the famous Islamic philosopher al-Farabi (c.872-950). Al-Farabi elaborated an equal-tempered approximation of

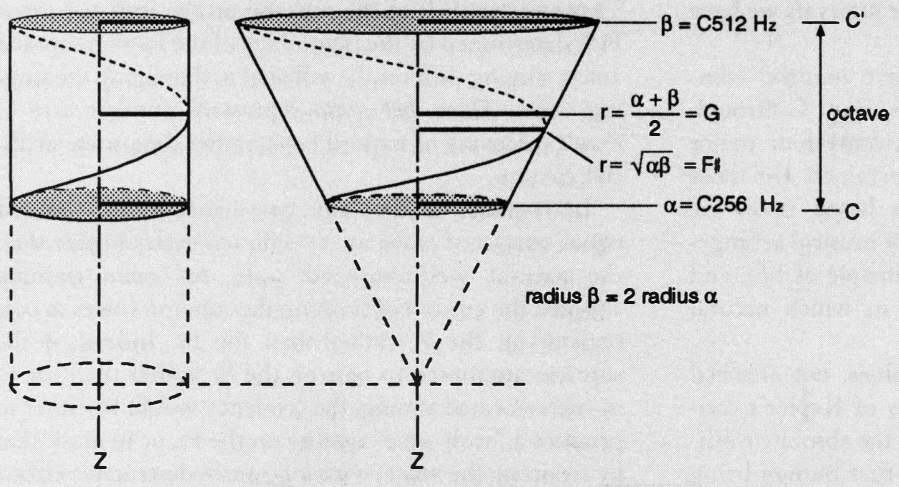


FIGURE 3. *Simple spiral action in the complex domain (left) is cylindrical in form; at one-half rotation, the distance moved along the vertical z-axis is one-half the distance moved along the z-axis by a full rotation. The radius at one-half rotation is the arithmetic mean* $(\alpha+\beta)/2$, *which divides the octave at the fifth, or the movement from C to G. In self-similar spiral action (right), the radius at one-half rotation is the geometric mean* $\sqrt{\alpha\beta}$, *corresponding to the movement from C to F♯.*

the values of a well-tempered octave scale. It was al-Farabi's work, carried into Western Europe, which contributed a leading part in establishing the octave form of well-tempered scale.

After the work of the circles of Pacioli and Leonardo, the most important next step of progress in the perfection of this aspect of the Classical Idea were the contributions of Johannes Kepler, the founder of astrophysics, and, in fact, the founder of modern mathematical physics as a whole. As Kepler writes, his work in music, in the creation of the root-conceptions of modern topology, and his astrophysics, were premised chiefly on the preceding work of Cusa, Pacioli, and Leonardo, as supplemented by some very important work by Albrecht Dürer.[4]

In examining Kepler's work on the well-tempered system, we must separate the particular values which Kepler supplies for the principal harmonic intervals of the well-tempered scale, from the method of hypothesis he employed to produce these results. As Kepler himself specified, to define more correct values, both for astrophysics and music, certain specific advances in mathematical physics must be developed to perfect his own hypothesis.

Kepler specified the requirements of a differential calculus, a task undertaken by Blaise Pascal (1623-1662) and completed by Gottfried Leibniz (1646-1716). Kepler also specified the need for an adequate method of geometric determination of the values of what are called elliptic functions. The problem of defining elliptic functions was solved in principle at Germany's Göttingen University by the beginning of the 1860's, chiefly by the successive work of Carl Gauss (1777-1855) and Bernhard Riemann (1826-1866).

By employing today the advantages of the work of such leading nineteenth-century mathematical physicists as Gauss, Lejeune Dirichlet (1805-1859), Karl Weierstrass (1815-1897), and Riemann, we are able to derive the correct values for the well-tempered system in the most rigorous and conclusive way.

The harmonic orderings of the well-tempered system, centered upon well-tempered values for the minor third, major third, fourth, arithmetic-geometric mean, geometric mean, and fifth, are identical to the correct values for astronomy, and are congruent with the Golden Section. Kepler was correct as far as he had progressed in detail; the modern Gauss-Riemann physics of the complex domain permits us to provide the corrections in method and values in a rigorous and conclusive way (SEE Figure 3).

In the well-tempered system, we begin with the harmonic intervals of the minor third, major third, fourth, fifth, and the Golden Mean (F♯), and with the derived distinctions between major- and minor-key harmonic progressions constructed in this way. We are able to construct twenty-four major and minor keys, and their appearance as scale-inversions, in this way.[5]

To construct the system in first approximation, it is sufficient to take the tone of the key of C-major or C-minor which lies on the minor third, major third, fourth, Golden Mean, and fifth, as the tonic tone of a new major or minor key, and to construct the minor and major thirds, fourth, Golden Mean, and fifth for that key signature, as we construct such harmonic progressions for C-major and C-minor.

Our first construction of the harmonic system, begins from middle C=256. We refine this construction, by going to C above middle C, C′=512. We repeat the first approximation, in determining the intervals of a minor and major third, fourth, geometric mean, and fifth, reading downward, from C′ to C. We repeat this for each

of the key signatures whose harmomic intervals we have defined by the first approximation.

By these combined efforts, we have mapped completely each of the thirteen half-tones, from C through C′ in the well-tempered system of twenty-four major and minor keys. The values so determined are those congruent with harmonic orderings based upon the Golden Section. Hence, this is the only musical arrangement which is coherent with the principle of life, and thus the only musical arrangement in which natural beauty is possible.

All of these values are natural values, not artificial ones. The Gauss-Riemann correction of Kepler's construction shows that these values were the absolute musical values of our universe before the first human being existed. Man did not create the well-tempered system, any more than man created gravitation; man discovered both, correcting his error of not recognizing these natural laws earlier.

The basic values of *bel canto* vocal registration have the same quality of natural beauty. What we call *bel canto* voice-training is not some arbitrary system of singing; it is man's discovery of the natural qualities of the human voice's potential for singing.

The simplest example of this is the way in which the soprano voice naturally sings in a different quality of voice, in singing the F of the well-tempered system (at C=256), as opposed to singing the next half-tone, the F♯. This register shift of the soprano on the well-tempered F♯ is determined by the physiology of the human soprano voice; singing differently will lead to damaging the singing voice. Thus, *bel canto* represents another case of man's discovery of natural laws, rather than some artificial custom.

In response to the later prevalence of an elevated equal-tempered scale, at A=440, ten cycles higher than the natural well-tempered scale, *bel canto* training adopted the custom of training the soprano voices to pass register on the F, rather than the F♯. Indeed, if the soprano attempted to pass on the F♯, rather than the F, in such elevated tuning, the tendency would be either to produce a "wolf-tone" quality on the F♯, or to mask that by straining the voice, with long-term destructive effects on the voice itself.

However, the actual absolute pitch at which the soprano register-shift naturally occurs, is the same in both cases. In the well-tempered system at C=256, the discontuity between the registers occurs not on either the F or F♯, but in the no-man's land inbetween. Thus, in elevating the pitch, from A=430 to A=440, the issue is not that we have shifted the scale less than a half-tone of the equal-tempered scale. The issue is, that the elevated pitch places the F, which is below the discontinuity between registers in C=256, above that discontinuity.

If we set the sun of the solar system at C, according to scalar values based upon the distances of the planets

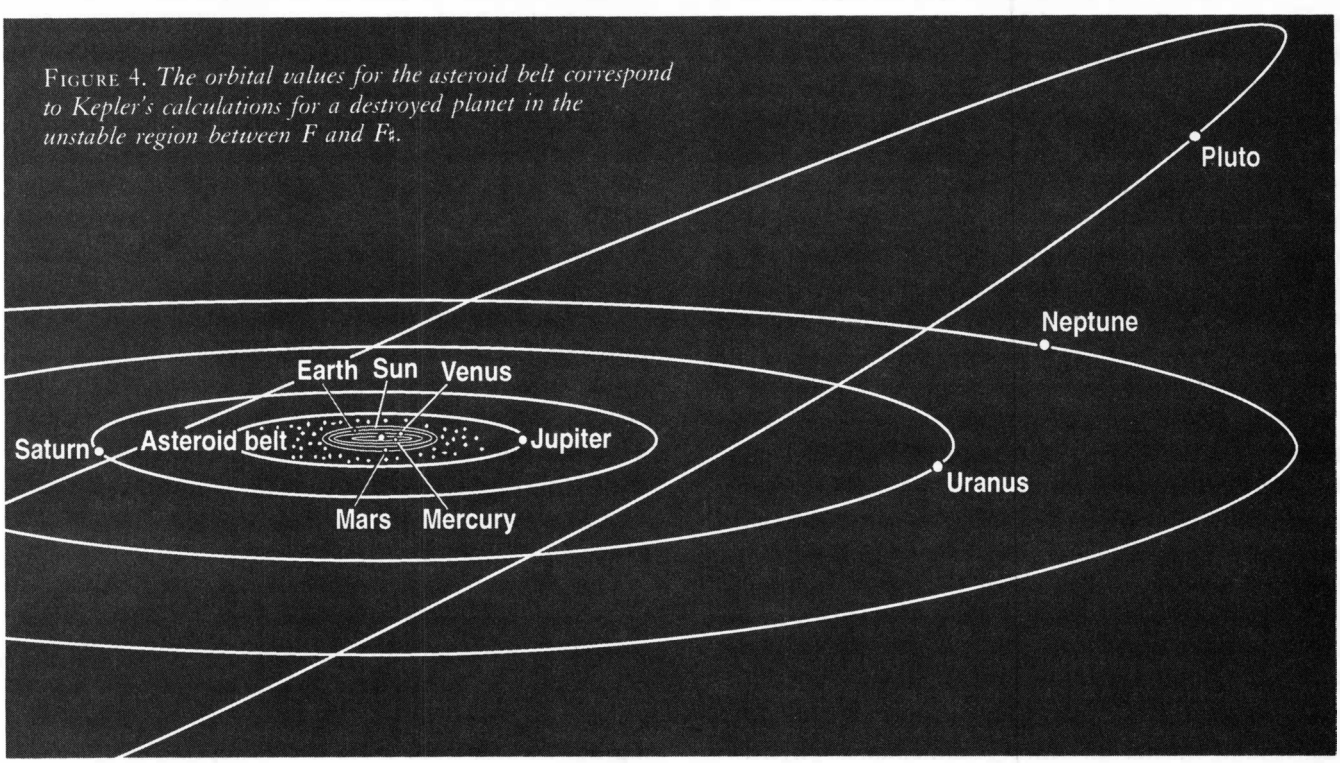


FIGURE 4. *The orbital values for the asteroid belt correspond to Kepler's calculations for a destroyed planet in the unstable region between F and F♯.*

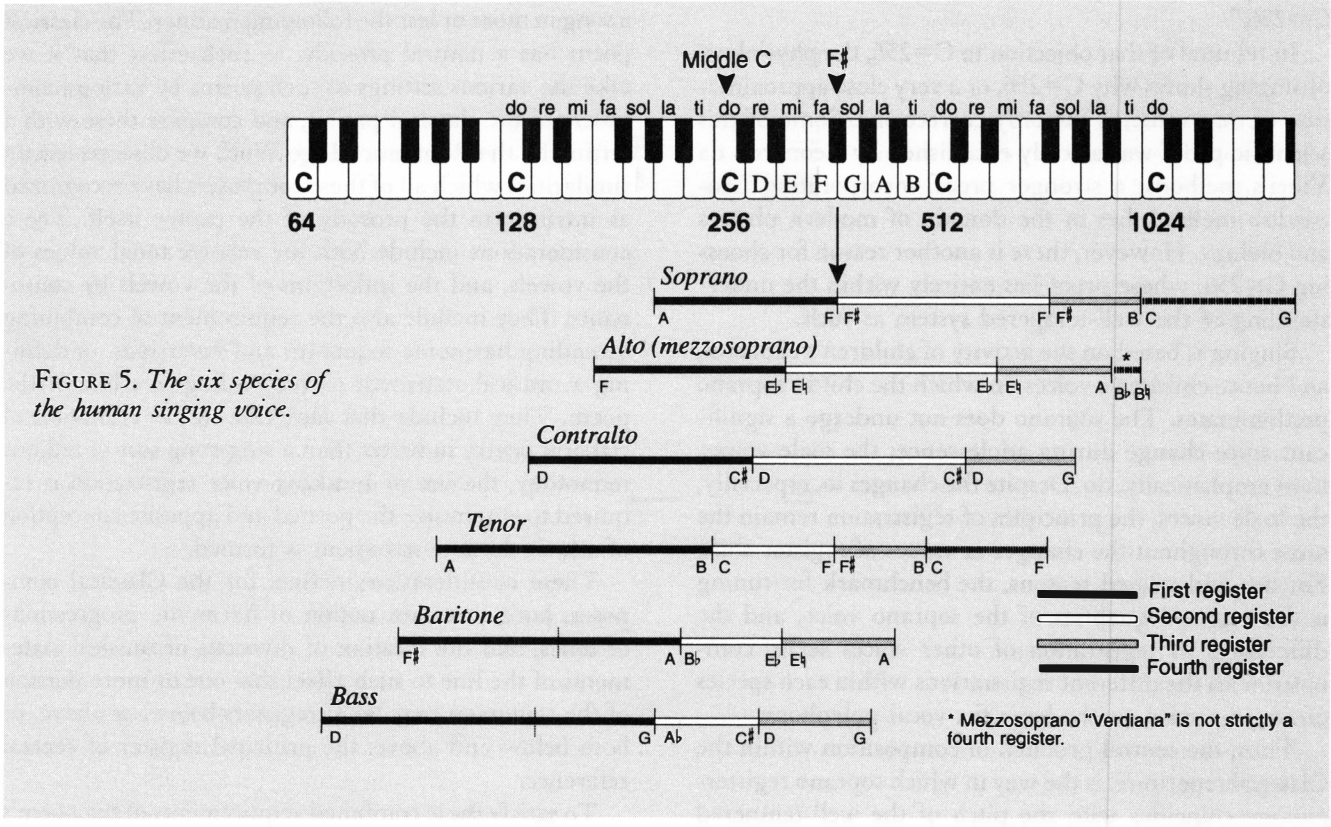


FIGURE 5. *The six species of the human singing voice.*

from the sun, or at F according to scalar values based upon the angular velocities of the planets, in both cases, the asteroid belt lies between the values of F and F♯. This doubly-connected conical musical function, according to Kepler, is the reason that, although the solar system requires the existence of a planetary orbit in this location, the planet in that orbit must have been destroyed. Kepler supplied the correct orbital harmonic values for this missing planet, which Gauss proved to be the true orbital values for the asteroids Ceres and Pallas first observed at the turn of the nineteenth century, nearly two hundred years after Kepler had insisted on a destroyed planet with those orbital values (SEE Figure 4).

In astrophysics, the region so defined as lying between F and F♯ is a zone of harmonic discontinuity, separating the dense inner planets of the solar system from the gaseous outer planets of the second series. In Kepler's astrophysics, the existence of a necessary planet within such a region of discontinuity ensures the destruction of that planet.

The values for the various register shifts of the tenor have zones of agreement and disagreement with the soprano, but the principles of all voice-register shifts are the same, despite the differences in the tonal values at which they occur. The various species of voices, soprano, tenor, mezzosoprano, baritone, contralto, bass-baritone, and so forth, form a tonal series, a series which is the basis for natural vocal polyphony (SEE Figure 5).

The hoaxster Helmholtz, who wrote his *Sensations of Tone* as a ponderous assault on both the well-tempered system and *bel canto* singing, makes much of the highly varied tuning of organs existing during the eighteenth century. However, Bach himself resorted to the obvious expedient of adjusting the organs with which he worked, and transposing the quoted keyboard key to coincide with the well-tempered tuning at the C=256 which had been standardized in France and Germany at that time. The construction of the best string instruments and woodwinds, during the seventeenth and eighteenth centuries, and the parallel standards of construction of the best stringed keyboard instruments, is a fact which Helmholtz slyly evades. Typically, these instruments were designed to be resonant at values of C congruent with C=256.

During the nineteenth century, as constructions of musical instruments were altered to accommodate A=440, and keyboard instruments redesigned to suppress polyphonic characteristics of the Classical ones, there was an attack upon C=256 standards as being purely arbitrary. It was argued, in effect, "You have chosen C=256 merely because it was a simple power of the number two. There is no reason any other tuning

which pleases us is not as valid, or even more valid than C=256."

In rebuttal of that objection to C=256, the physiology of singing shows why C=256, or a very close approximation of that value, is the only correct one. Some of this scientific proof was already established by Leonardo da Vinci's methods; a stronger proof, incorporating Leonardo's method, lies in the domain of modern physics and biology. However, there is another reason for choosing C=256, whose proof lies entirely within the understanding of the well-tempered system as such.

Singing is based on the activity of children's choruses, and hence children's voices, in which the child's soprano predominates. The soprano does not undergo a significant voice-change during adolescence; the male voices, most emphatically, do. Despite the changes in, especially, the male voices, the principles of registration remain the same throughout the changes in values of register-shift. For this and related reasons, the benchmark for tuning is the registral qualities of the soprano voice, and the differences in registration of other voices serve, combined with the different registrations within each species of singing voice, as the basis for vocal polyphony.

Thus, the central problem of composition within the Classical repertoire, is the way in which soprano register-passage coincides with the pitch of the well-tempered system. If the soprano register-shift occurs on the F required by A=440, a disharmony is introduced to the Classical repertoire. The principles of counterpoint require that the F lie within the relatively lower soprano register, and the F♯ be located in the relatively higher register.

For example, in the vocal repertoire of Mozart and Beethoven, the soprano's F must lie in the relatively lower register, and the F♯ in the relatively higher one. This is required for two principal reasons. The most obvious reason, is the well-tempered system, which requires the same *natural* division of the octave scale, in terms of quality of registration, as Kepler's planetary harmonics. The second is peculiar to the prosodic aspects of the songs of those two composers, in particular. If the register shift is on the F, the soprano will naturally sing the song wrongly from a poetical standpoint.

Throughout the classical vocal repertoire, through such examples as Brahms' "Four Serious Songs," the composer has written the composition for a specific species of voice in a key chosen for this purpose. In this example, either the bass or contralto. If one attempts to transpose this song to a different key, for the purpose of employing a different species of voice, the relations within the domain of the vocal-instrumental counterpoint of the keyboard part fall apart to a significant degree.

A Classical composer approaches the construction of a song in more or less the following manner. The classical poem has a natural prosody, to such effect that if we take the various settings of such poems by various composers of the classical period, and compare these with a setting by the Romantic Hugo Wolf, we observe certain similarities which all of these composers have recognized as intrinsic to the prosody of the poetry itself. These considerations include both the relative tonal values of the vowels, and the inflections of the vowels by consonants. They include also the requirement of combining ascending harmonic sequences and inversions, in defining a musical statement corresponding to a line of the poem. They include that fact, that in the recitation of classical poetry in better than a sing-song sort of tedious monotony, the use of speaking-voice registration is required to emphasize the posited and apposite conception of which the line-statement is formed.

These considerations define, for the Classical composer, both a certain notion of harmonic progressions of tones, and the location of divisions of musical statements of the line to such effect that one or more portion of the statement may lie in registers below, or above, or both below and above, the principal register of central reference.

To satisfy these combined requirements of the poem's musical setting, once the composer has chosen a certain species of voice for this song, and chosen between a minor and major harmonic sequence of utterance, the composer is obliged to choose a definite key signature, which divides the registration of the sung line as required. This is the most important consideration in choosing a key signature for a vocal composition.

Thus, as we have already noted the significance of the soprano and tenor voices as the pivotal point of reference for well-tempered composition, it is of the greatest importance to the composer, that the soprano register-shift occur on the F♯.

Hence, the elevation of the well-tempered scale which places the soprano register-shift so, is the only *natural* tuning for the composer. Hence, Mozart required tuning of A between 427 and 430. A value of 430.5 is the calculable upper limit for A; A=427 defines the lower limit of a comfortable soprano register-passage on the F♯. If the composer estimated in terms of equal-tempering, he would tend to choose the point of discontinuity between the two registers at a quarter-tone distance between F and F♯. A well-tempered keyboard tuning scaled to C=256, or A between 427 and 430, would fit the requirements for all species of singing voices comfortably.[6]

The grounding of the musical education is in the development of the singing voice. Pre-school-age chil-

dren learning to sing with their minds set at an habituated "perfect pitch," based on C=256, is the normal foundation for a musical population from which all composers and performers, amateur and professional, and audiences, are best drawn. It is such early foundation in singing which establishes music as a native language of the population.

The development of the Classical musical instruments, especially since Leonardo's work on this, has been governed by construction of instruments which imitate the natural qualities of the properly trained singing voice. One attempts to cause the strings and woodwinds to sing *bel canto,* and approaches the shaping of keyboard instrument's enunciation of tones and phrasing of tones to the same effect. And, so on. (SEE Figure 6)

The instrumental ensemble is a product of vocal polyphony. The significance of this is rather readily demonstrated by music students. In writing of simple canonical exercises, choose specific species of singing voices, with regard to their natural register-shifts. The differences in progressions, with respect to register-shifts, among the voices, define the way in which the various species of voices might be placed with respect to one another, and the difference in results effected by substituting different species of voices for each assigned part. By creating musical instruments which imitate such species of voices, by virtue of their constructions, or by string instruments which can simulate the registral distinctions among differing species of voices (as Bach's works for unaccompanied strings illustrate this most forcibly), the principles of vocal polyphony are elaborated in a greatly expanded domain.

The connection is usefully illustrated by comparing the vocal and instrumental compositions of Mozart and Beethoven, separately, and in parallel. The same principles of use of singing-voice registration, which confront us immediately in the composition of the vocal part, govern the composition of the instrumental work. For this reason, the placement of the soprano register-shift in the vocal part, is also an imperative of registration and tuning in instrumental works.

This approach to counterpoint has been savagely impaired by the modern teaching of chordal progressions. It is important for musical literacy, that no performer or audience ever hear a chord as a chord, but rather as polyphony. Each tone of the intoned chord is recognized as a tone in some species of singing voice, as a mere momentary cross-sectional slice of an ongoing piece of polyphonic utterance.

All the topics we have referenced thus far, pertain only to the domain of *natural* beauty. Mankind's work in all the features we have treated thus far is only the work of recognizing *natural* laws of music, independent of the rightful powers of choice of the musician. Granted, the mastery of these *natural* qualities of musical beauty, is the imperative foundation of musical artistry, and something which must never be violated in the composition of music or its performance. In other words, these are either simply the *natural* laws of musical science, or principles directly derived from nothing but the application of those *natural laws* to the empirics of the musical apparatus.

All that is beautiful in music, which is not simply the faithful service of *natural beauty,* is the product of *artistic* beauty.

Artistic Beauty As Such

Artistic beauty is the essence of that which sets mankind apart from, and above, the beasts. This quality of mankind has two interdependent aspects. The first of these two aspects we may conveniently identify as the *formal* one; the second, inseparable aspect we may identify as the *spiritual* one. We treat the formal aspect of the matter first, and situate the spiritual aspect in that frame of reference.

What distinguishes human society, and the human individual, from the "society" of the beasts? Empirically, the distinction may be made as follows.

The ethnologists have postulated that the most primitive condition of mankind is what they name a "hunting and gathering society." Whether such a form of society ever existed, or not, there is no doubt that the early primitive condition of mankind must have been confronted with the problems which the ethnologists postulate. Certain general features of such a postulated form of society can be estimated with relatively great precision.

Under such conditions of wilderness life, an average of about ten square kilometers of the Earth's land-area would be required to sustain an average individual. This signifies a ceiling upon the size of the living human population, of approximately ten million individuals for this planet as a whole. The level of subsistence and life expectancies of such a population would be very poor, and an average age of death of the individuals significantly below twenty years. The cultural life of mankind in such a state would be more or less comparable to that of troops of baboons.

Today, the human population is in excess of five billion. Admittedly, most of that five billion live in deprived and precarious conditions, conditions which have become progressively worse, on the whole, during the recent twenty years. However, had we deployed adequately the levels of technology already existing, we could sustain more than ten billion at levels of existence and life expectancies characteristic of the industrialized

nations during the late 1960's and early 1970's. At present, the frontiers of science and technology have placed within the reach of the next two generations, the highest potential rate of increase of the *per capita* productivity of labor in history.

The rise of population can be traced with reasonable, if somewhat diminishing accuracy, backwards for more than six thousand years. We are able to correlate the rates of increase of potential population-densities with precise changes in applied technologies. In effect, we are able to construct a mathematical function which correlates advances in science and technology with increases of mankind's potential population-density, subject to the requirement of increasing *per capita* standards of consumption and life expectancies.

Thus, relative to the ethnologist's postulated "hunting and gathering" society, mankind's absolute population-density has been increased by three orders of magnitude (e.g., approximately one-thousand times). In terms of the energy content of *per capita* consumption, we must add additional orders of magnitude of improvement. In addition to this, there is an approximate fourfold improvement in life-expectancy. In contrast, no animal species is capable of improving its conditions by even a small fraction of an order of magnitude, except through human intervention as animal husbandry.

Thus, that aspect of the nature of the human individual, by means of which mankind generates and efficiently assimilates scientific and technological progress, is the aspect of individual human behavior which sets mankind apart from, and above, the beasts. It is the application of that same distinctively human quality of behavior to *natural beauty,* which is the root of *artistic beauty.*

This locates the source of artistic beauty in those same potential creative powers of the individual mind which account for mankind's ability to generate and to assimilate efficiently valid fundamental discoveries in physical science. We limit the discussion of the formal aspect of such creative processes to a few bare essentials of the sort readily observed by inspection of the matter.

Among the most commonplace examples of the creative potential of the individual is an event which often occurs among happy very young children occupied in constructive play with building blocks. At some point, the child may effect what is for that child an original discovery, expressed as the ability to build something which the child had been unable to build before, and to adduce from this success a principle which the child discovers can be repeated in that and other ways. In that moment, witnessing the child's sudden illumination with a special quality of joyfulness, the adults observing may be brought to the verge of "tears of joy."

In that experience, we witness the germ of the principle of artistic beauty: the delight in the exercise of our individual creative powers of discovery which we associate with the notion of "tears of joy."

In music, we experience this in a good performance of Mozart's *Requiem* or the simpler *Ave Verum.* If the conductor does not evoke a sense of the specific quality of emotion associated with "tears of joy," the conductor is informed that either he is seized by a bad state of musical mind, or that the performance lacks the quality of "rightness."

We can more or less readily observe, by thoughtful inspection of the matter, that we are capable of two general qualities of emotional state. On the one side, there is the nobler condition typified by "tears of joy." Opposite, is the erotic emotion, which we associate with hedonistic lusts such as greed and rage. The Classical Idea is associated with the first, and the Romantic and Modernist approach to music with the second.

In Plato, the first quality of higher emotional state is associated with the notion of the Good and the Beautiful—*agathos,* as in the woman's name, Agatha. In the original Greek of the New Testament, a related notion is identified by the verb-related term *agapē,* as directly opposite to the lower quality of emotional state, *eros.* In Western European Christian culture, *agapē* is rendered as *caritas* in the Latin, and the *charity* of the King James' Authorized Version of the New Testament. It signifies, for Western European culture, the quality of love of God, love of mankind, love of truth, and love of beauty, and the controlling emotional state with which we approach life's challenges.

We observe that this quality of *agapē* occurs in a special way in connection with valid forms of creative mental activity. It occurs as the prize secured when we effect a valid discovery. Yet, without this same emotional quality as a driving force, we are unable to sustain the qualities of concentration needed to effect such discoveries.

In the effort to find a solution to an inherently soluble problem, we observe a student or craftsman hammering away in a state of more or less thinly disguised rage, and perhaps smashing his tools when he or she fails to obtain success in that way. In contrast, we observe the happier, relatively calm state of mind, blended with great concentration and energy, quietly proceeding to attack the problem on a flank, working stubbornly, confidently toward a solution.

In musical performance, we observe the master, mobilized in the appropriate, approximately *agapic* state of mind, sustaining successively a very long line of phrasing over a passage, a sequence of passages, an entire section of a movement of a work, an entire movement, an

entire work. The beauty of some of the *adagio cantabile* movements of Mozart and Beethoven instrumental compositions, are excellent illustrations of this.

If we compare such a performance of these works, with the erotic quality of sentimentalism of other performances by celebrated artists, the difference glares out at us. It was said of Wagner's *Liebestod,* from his *Tristan and Isolde,* that the performers' objective was to leave "not a dry seat in the house." Such is the distinction between the *agapic* quality of the Classical Idea in music, and the erotic approach, bordering upon the Dionysiac or irrationally mystical, of the Romantic approach.

Some performers have recognized the fact of the distinction, but have understood it wrongly. They accept the fact that Classical instruments were tuned to C=256, and accept the prohibition against imposed arbitrary sentimentality upon the performance of the score according to the original text. However, the result is dullness. There is no *intensity* in the execution, no compelling sort of distinctive "long phrasing" of the performance. The almost metronomic absence of any governing emotion at all, has been substituted for the abominations of the Romanticist's erotic sentimentality, and the Modernist's Dionysiac vacillations between the Dionysiac and the intoxication with the nothingness of the mystically obscene.

FIGURE 6. *The fortepiano's frame, built almost entirely of wood—as opposed to the metal frame of the modern pianoforte—combined with a greater distinction between registers, gives a* bel canto *singing quality. This instrument was constructed in Vienna by Conrad Graf around 1830.*

Among the best ways of bringing out such crippling emotional states among literate musicians, is to lure them into reciting a short composition in classical poetry. Each of the more fundamental among the interpretive problems of their musical performance will tend to be shown in that terrible recitation of poetry. Another device which is usually more or less infallible to the same effect, is to lure them into discussing the interpretation of a musical composition from their repertoire. The response is usually either pedantic discussion of mere technical aspects of the composition, or sentimental driveling along the same general lines as the usual run of newspaper musical critic's reviews and dust-jacket program notes.

The notion that the composer has elaborated a composition as a musical idea referenced to the potential for developing such an idea in chosen musical subject matter, is something of which the lured musician appears to be ignorant.

There is perhaps no one mode in which accomplished musicians do communicate the notion of *agapic* qualities of musical ideas. Our modern musical culture does not accustom us to communicating on such subjects; most musicians leave such matters to the domain of musical expression as such, rather than words. Sometimes, a verbalization of musical ideas occurs as overtones of musical rehearsals and kindred occasions. The kinds of tests we have suggested will usually bring out the failed musician's problems, but are not infallible ways of adducing the desired quality of expositions from the good musician; the latter usually resort to demonstrations made with aid of their instruments, showing the problems of the wrong way, in contrast with the proper approach. In such ways, they attempt to make the differences heard. In the final analysis, no other approach is a fully adequate one.

Nonetheless, what we have stated here so far indicates the general idea to be conveyed. In practice, perhaps no musician is fully satisfied that any performance he or she has given, or heard, is yet an adequate one. The drive to discover flawed or inadequate treatments, and to discover ways to better serve the purpose, is the life's blood of musical activity, as every true scientist is impassioned by the determination to supersede the inadequacies in his most recent, most valued discoveries. That is the *agapic* way of such professions at their best.

Yet, we may add something of general applicability, which is helpful in making the point a bit clearer. What we aim for in the Classical Idea of music, is polyphonic and *agapic* "transparency" of the composition as a unified

process of elaboration—development—of a musical idea.

Now, the dividing line between *natural* and *artistic* beauties becomes blurred.

In 1747, J.S. Bach entered into a famous collaboration with the Prussian monarch and amateur musician Frederick the Great. The result was Bach's *A Musical Offering*. It is both a beautiful musical composition and a series of studies defining the rudiments of the discovery of a new dimension of approach to the methods of classical musical composition.

After Mozart undertook his intensive studies of Bach, about 1782, Bach's *A Musical Offering* contributed a major influence to his work. The results are most directly represented in a series of three compositions. The first is the C-minor keyboard sonata, K. 457. The second is the so-called "Dissonant" quartet, K. 458. The third is a keyboard fantasy, written as a prologue to the K. 457 sonata, K. 475. The same musical idea is elaborated in application to other locations, but these three, taken together, represent a formal statement of Mozart's assimilation and further development of the discovery which Bach presented in his *A Musical Offering*.

The same musical idea is the principal subject of several works of Beethoven. In the keyboard repertoire, these include his "Pathétique" sonata, Opus 13, and his last keyboard sonata, Opus 111. Schubert also makes the same musical idea the principal subject of several compositions, including, most famously, his posthumous C-minor keyboard sonata and the "Kriegers Ahnung" of the collection published as his *Schwanengesang*. Chopin, demonstrably predominantly influenced by Bach more than Beethoven, nonetheless includes among his most famous references to Beethoven's work and explicit treatment of Beethoven's Opus 111, as his own Opus 13.

In effect, the discoveries situated at the center of Bach's *A Musical Offering* were thus rendered a virtual law of classical compositional method. This is exemplary of a general principle of the Classical Idea, not only in music. As in valid scientific work, the initial discovery of a principle has the implications of a work of great artistic beauty. Once established, that same principle becomes a part of the repertoire of natural beauty.

This is not the exception to the rule, of the distinction between natural and artistic beauty; rather, is the apparent exception which proves the rule.

All Classical art, as a whole, and in each of plastic and non-plastic aspects of art as a whole, has a directed character. The direction, is the perfection of man's use of natural beauty. The result of progress is, that the greater perfection so achieved becomes a higher standard for natural beauty's expression as art. The discoveries which have established this higher standard persist as artistic beauty for generations to come; the enjoyment of such works is the act of reliving the process of discovery, and is thus of the character of durable artistic beauty on that account. At the same time, what is proven to have been a valid discovery in the production of artistic beauty, becomes a principle of natural beauty thereafter.

The essential distinction between natural and artistic beauty, is that *natural beauty* is that which is decreed for art from the beginning, by God. *Artistic beauty* is that use of lawful natural beauty shaped by valid use of those creative powers with which God has endowed the human individual. The situation is broadly the same as in the progress of physical scientific knowledge and practice. The difference is, that the *agapē* which enables the scientist to produce valid fundamental discoveries, and to guide society in the use of those discoveries for the advantage of mankind, is the end in itself of the creation and re-creation of artistic beauty.

The purpose of art is to celebrate and strengthen the noblest state of mind which the individual person can achieve, and to aid thus in making us better people. It is a contribution best and most naturally celebrated in the manner *agapē* prescribes, by an intensification of that anti-erotic quality of emotion we associate with childlike "tears of joy."

The most precious gift we may receive, is the means to bring forth the force of *agapē* to rule our minds, and guide our actions, at will. Artistic beauty is a lever by means of which we are enabled to do just that. That is the purpose of art in general, and music in particular, according to the Classical Idea.

NOTES

1. Unless specifically indicated as B.C., dates given in this are A.D.
2. One of St. Augustine's most extensive elaborations of the differences between the Christian and Platonic world outlooks can be found in his *City of God,* books 8–10 and 12 (New York: Random House, 1950).
3. On the usage of "Venetian Party" during the early eighteenth century, see H. Graham Lowry, *How the Nation Was Won, 1630-1754* (Washington, D.C.: Executive Intelligence Review, 1988). Under the reign of England's Queen Anne, all of Western Europe and English-speaking North America was divided between the allies of Gottfried Leibniz and Jonathan Swift, on the one side, and what was termed the "Venetian Party." The latter included the Duke of Marlborough's Liberal Party in England, and the corrupted Georg Ludwig of Hanover, later Britain's George I.
4. Johannes Kepler, *The Secret of the Universe* (1596); *Commentaries on Mars* (1609); *On the Six-Cornered Snowflake* (1619); *Harmony of the Universe* (1619); and *Epitome of Astronomy* (1620).
5. Arithmetic-geometric mean, geometric mean, and Golden Mean (or Golden Section) are each distinct values for F♯, depending on the construction of the scale.
6. A summary of the rigorous treatment of the formal aspect of such creative processes, is provided in Appendix A, Book II of the Institute's "Manual on the Rudiments of Tuning and Registration."