

Sound, Time, and Musicality

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Comprehensive Examination Response

Composition

Sound, Time and Musicality

INTRODUCTION

The following document presents a narrative of the basic concepts of the following texts.

New Musical Resources by Henry Cowell
The Craft of Musical Composition by Paul Hindemith
The Schillinger System of Musical Composition by Joseph Schillinger
The Technique of My Musical Language by Olivier Messiaen
Genesis of a Music, by Harry Partch

Rather than providing a summary (and wholly uninteresting) response about each text, I have opted for a more nuanced approach. This approach examines the corpus of literature and arranges theoretical material from each text as it pertains to fundamental concepts of music. This document is divided into three parts. Part 1 collates and examines the authors' thoughts in three categories: *Thoughts on Sound*, *Thoughts on Time* and *Thoughts on Timbre & Musicality*. Part 2 briefly discusses problems that composers face while creating new music and offers possible relevant *lessons* from the texts. And finally Part 3 lists the *essential value* of each text as it relates to the modern composer.

Henry Cowell viewed music as a combination of just two basic elements: *sound* and *rhythm*. I agree with the premise, for which I have modeled this response, and offer only to adapt the principle in two ways. First, what Cowell describes as *rhythm* should be referred to as *time* as this term more appropriately reflects the essence. And secondly, I propose the addition of a category that deals with everything else that goes into music making. For lack of better terminology, I have referred to this category as *Timbre & Musicality*.

PART 1

Thoughts on Sound

“Supremacy to Melody! . . . rhythm remains pliant and gives precedence to melodic development; the harmony is chosen by the melody, an outcome of it.”¹

-Messiaen

Introduction

Sound, for the purpose of our examination, refers to frequency(ies), and intervallic relation between them, which form the basis for melodic and harmonic language. The following is a narrative of the material as it relates to the fundamental concept of sound. Each author’s thoughts on the subject are examined individually, followed by a brief set of conclusions.

Messiaen

The Technique of My Musical Language by Olivier Messiaen, a church organist and pioneering French composer in the mid 20th century, is best described as a brief account of the techniques he used in his own compositional process. Published in 1944, this text was intended to help students and members of his audience understand his music in greater detail. Messiaen intentionally limited discussions in *The Technique of My Musical Language* to the three basic dimensions of composition, systematically those pertaining to rhythm, melody, and harmony. Messiaen’s discussions of rhythm and harmony remain detectibly brief, owing to the fact that Messiaen himself considered rhythm to be only supplementary to melody, and harmony a product of it.² In that regard,

¹ Olivier Messiaen, *The Technique of My Musical Language* Bibliothèque-Leduc, 831 (Paris: A. Leduc, 1956), 31.

² *Ibid.*, 13.

Messiaen commits the majority of *The Technique of My Musical Language* to the study of melody.

Regarding melodic content and contour, Messiaen admits influence by a number of sources. Chromatic formulae of Bartók, melodies from Mussorgsky and Debussy, Grieg's *chansons*, French and Russian folk song, Gregorian *plainchant*, and Hindu *ragas* all influenced Messiaen's melodic writing. In some instances, the melodic material he draws upon has been used as an approximation, while other such content in *plainchant* were arranged nearly verbatim, when separated from its original mode or rhythmic duration.³ In other words, Messiaen quite literally 'borrowed' melodic lines from a number of sources and merged them with his own rhythmic methodologies. Moreover, Paul Dukas, Messiaen's teacher, was the intellectual resource behind several of Messiaen's methodological successes, including his suggestion that Messiaen listen to and notate bird-song, a technique with which Messiaen is commonly associated.⁴

Messiaen's discussion of harmony centers on the use of 'added notes' namely sixths and augmented fourths. Debussy appears to be Messiaen's primary harmonic influence. Messiaen explain that while 'added notes' appear foreign to the chord, they are in reality a resonance of the fundamental and thus belong to the overtone series.⁵ The discussion of harmony continues with a somewhat cryptic discourse on special chords and chord-clusters, followed by the introduction of "Modes of Limited Transposition." That is, certain modes can only be transposed a limited number of times without an exact repetition of content, enharmonic or otherwise.⁶ Messiaen associates the first such mode, also known as the whole-tone scale, with the work of Debussy and Dukas, although originally a product of Eastern musical customs. The second mode of limited transposition consists of a set of four symmetrical groups of chords containing three notes each, known today as tri-chords. The third and final mode of limited transposition refers to a division of three symmetrical groups of four notes each, known today as tetra-chords. Messiaen associates these tri-chords and tetra-chords with the Russian composers Rimsky-Korsakov, and Scriabin, although the concept of them can be traced back to the

³ *Ibid.*, 31–4.

⁴ *Ibid.*, 34.

⁵ *Ibid.*, 47–9.

⁶ *Ibid.*, 50–4.

Ancient Greeks.⁷ Messiaen's discussion of harmony, and the text itself, concludes with a brief mention of optional tuning systems and polymodality.⁸

Cowell

Published in 1930, Henry Cowell's book, *New Musical Resources* was written originally a decade earlier while he was a student at Stanford.⁹ Cowell's work, like Messiaen's, was inspired by the desire to explain his compositional methods. This book is best described as a general treatise on composition with an approach that is as much science as speculation. It is important to note that the numbers used in arithmetic in this book are not literal scientific values but rather representations of the underlying principles of the compounding division inherent in the overtone series. Nonetheless, Cowell refers to *New Musical Resources* as a "theory of musical relativity."¹⁰ He explains...

*"...The purpose of the book is not to explain the materials of contemporary music, but to point out the influence the overtones series has exerted on music throughout history, how many musical materials of all ages are related to it, and how, by various means of applying its principles in many different manners, a large palette of musical materials can be assembled..."*¹¹

Cowell explores sonic applications of the overtone series in areas such as polyharmony, that is, on the unity of the low overtones and undertones, and dissonant counterpoint, the latter he credits to the preliminary work to Ruggles, Hindemith and Schoenberg.¹² Cowell concludes his dialog of material pertaining to melody and harmony with a discussion on non-tertian chord formation such as secundal, quartal and quintal based harmony and, finally, tone clusters. While Cowell admits the composition of his music preceded the methods contained in *New Musical Resources*, and that these methods coalesced only after a great deal of acoustic research, he describes their use as

⁷ *Ibid.*, 59.

⁸ *Ibid.*, 68–70.

⁹ Henry Cowell and David Nicholls, *New Musical Resources* (Cambridge, England; New York: Cambridge University Press, 1996).

¹⁰ *Ibid.*, xi.

¹¹ *Ibid.*, x–xi.

¹² *Ibid.*, 40–1.

“instinctive.”¹³ Cowell essentially sought, and found, an answer to why he created the music he did. This fact, by its very nature, places *New Musical Resources* in the context more of an analytical textbook rather than one of composition.

Hindemith

Paul Hindemith's *Craft of Musical Composition* is both a treatise on the system of music composition he employed, and also a resource for practicing parts of it. Published in 1940, *Craft of Musical Composition* is organized into two books. The first book describes in scientific detail the techniques and methodologies relating to sound used in his composition. The second book deals solely with exercises in two-part writing. As a result, Hindemith's discussions in *Craft of Musical Composition* are limited entirely to the sonic realm of melody and harmony.

Hindemith was obsessed with natural cosmic forces and endeavored to create a “foundation” for composition that conforms to those laws.¹⁴ He even equated his pursuit to the ancient Greek philosophy of the “Music of the Spheres.”¹⁵ The language throughout his treatise equates musical characteristics with processes in nature. Like Cowell, at the center of his theory are overtones; Hindemith uses the analogy of light spectrum. The lower overtone series function as a harmonic force while the higher overtones in the series function as a melodic force.¹⁶ The interaction of these forces is what dictates the fluctuation of tension levels. Tonality and triads are a natural force like gravity, and intervals become the ‘building stones’ (what I believe to be an analogy for atoms)...

“What did tonal materials mean to the ancients? Intervals spoke to them of the first days of creation of the world: mysterious as Number, of the same stuff as the basic concepts of time and space, the very dimensions of the audible as of the visible world, the building stones of the universe, which in their minds, was constructed in the same proportions as the overtone series, so that measure, music, and the cosmos inseparably merged.”¹⁷

¹³ *Ibid.*, xv.

¹⁴ Paul Hindemith, *The Craft of Musical Composition*, 2 vols. (New York, London: Schott & co., 1941), vol.1, 7.

¹⁵ *Ibid.*, 53–6.

¹⁶ *Ibid.*

¹⁷ *Ibid.*, 12–13.

Keeping with the natural theme, Hindemith suggested intervallic relationships should be viewed from the perspective of a solar system. The principal tone occupying the sun's position and the second tone in the interval orbiting around at a derived distance relative to the strength of its connection (i.e. the larger the interval, the weaker the connection).¹⁸ Hindemith describes this process as "derivation." Through derivation (and a little manipulation of the 7th partial), Hindemith is able to show that diatonic and chromatic scales can be derived directly from the upper overtone sequence.¹⁹ Hindemith goes on to discuss the combination of tones created by reinforcement of overtone sequences from two or more sources while sympathetic vibrations of the instruments themselves or nearby objects create undertones.²⁰

In combination tones, essential to the foundation of his theory in harmony, deeper tones naturally vibrate at a slower rate than high tones and therefore carry more weight. Hindemith classifies them according to two orders; combinations of tones that 1) contain a tritone and 2) those that do not.²¹ Therefore, harmonic progression is the result of the intervallic tension of combination tones in succession. Composers should strive for smooth fluctuations between chords that 1) contain tritones and 2) those that do not. The degree of fluctuation is responsible for "harmonic crescendo/decrescendo" as well as cadential and modulatory structures.²²

Hindemith believed innovation could be made in using multiple tuning systems. But also pointed out the problems associated with scales based on mathematical principles, twelve-tone, quartertone and microtone as well.²³ Because he saw music as natural, anything that went against the natural law had no business in music. Hindemith also seems to be presenting a rebuttal to all composers who, for the sake of individuality, avoided tonal materials. This passage seems a direct rebuttal to Schoenberg and the Second Viennese School....

"All composers nowadays make use of the extended harmonic and melodic relations that result from the use of material of the chromatic scale, but for lack of

¹⁸ *Ibid.*, 57

¹⁹ *Ibid.*

²⁰ *Ibid.*

²¹ *Ibid.*, 57–64.

²² *Ibid.*, 109–74.

²³ *Ibid.*, 32–41.

an adequate theoretical foundation they still try to cram every manifestation within the narrow confines of diatonic interpretation.”²⁴

Hindemith briefly addresses the concepts of atonality and polytonality in relation to tonal materials. Hindemith viewed atonality as unnatural and dismissed polytonality as naturally impossible. He goes on to describes ‘good music’ as that which handles tonal materials skillfully and intelligently, and ‘bad music’ as aimless.²⁵

Ultimately, Hindemith believed modern compositional practices must be reconciled with tonal materials and that composers, teachers, and students have responsibilities to that end. It was the responsibility of the composer to offer new perspectives on materials. The teacher is responsible to reconcile new materials with the old. The student, meanwhile, is responsible to learn both old and new materials with the confidence to question the instruction.²⁶

Schillinger

Ukrainian-born musician and composer Joseph Schillinger developed *The Schillinger System of Music Composition* during the later part of his life as a teacher of music at Teachers College, Columbia. The multi-volume work remained unpublished until after his death, and even today is believed to be incomplete. Henry Cowell, a close friend of Schillinger’s, describes *The Schillinger System of Music Composition* in the overture to the enormous treatise in the following words ...

“The Schillinger System makes a positive approach to the theory of musical composition by offering ‘possibilities’ for choice and development by the student, instead of rules hedged round with prohibitions, limitations and exceptions which have characterized conventional studies.”²⁷

Schillinger’s treatise, compiled, edited and published posthumously by Arnold Shaw and Lyle Dowling in 1941, can be best described as an elaborate collection of twelve books about compositional techniques and how they are intricately related to

²⁴ *Ibid.*, 47.

²⁵ *Ibid.*, 152–5.

²⁶ *Ibid.*, 1–13.

²⁷ H. Cowell, "Excerpt from the Overture," in *The Schillinger System of Musical Composition* (New York: Carl Finsher Inc., 1946), xi.

science and mathematics. A complete understanding of the corpus of Schillinger's system would take years of dedicated study, a degree in mathematics, and reams of graph paper. Yet recognizing that nine of the twelve books deal with varying degrees of melody and harmony or interaction thereof is an indication of the value Schillinger placed on the subject.

The Schillinger System of Music Composition book II, deals entirely with a theory of pitch and scales. The theory of pitch and scales concerns pitch considered in continuity. That is, one tone after another. *Schillinger System* approaches pitch and scale by first selecting a primary system of tuning, and then determining the tones to use in a composition from the ones made available by the appropriate tuning system. To complicate matters, Schillinger perceived scales as consisting of pitch units and the elements between them, thus the possibility to create expanded scales increases exponentially. These sets of tones, called "pitch-scales", serve as the raw material for Schillinger's tonal language regarding both melody and harmony.²⁸

Over the next several books, Schillinger methodically delineates the process of melodic composition and scale use, elaborating on the construction of melodic forms from pitch-scales, modification of melodic forms, composition of melodic continuity, and deduction of harmonic forms from pitch-scales.²⁹ Book five, titled *Special Theory of Harmony*, is undeniably the most extensive in the collection. It expands the previous studies and demonstrates the interrelationships among them. By dividing the material into two sub-systems dealing with the "diatonic" and "symmetric" harmony, Schillinger expresses the conventional concepts of harmonic structure, cycles, progressions, doublings, and inversions. Moreover, with subsequent methodologies dealing with harmonic function, tonal extension and chromaticism, Schillinger links the development of harmony with the 'continuity' of melody.³⁰ Further propositions of counterpoint and melodic variation confirm his approach.³¹

²⁸ Joseph Schillinger, Lyle Dowling, and Arnold Shaw, *The Schillinger System of Musical Composition*, 2 vols. (New York: C. Fischer, 1946), 101.

²⁹ *Ibid.*, 99–179.

³⁰ *Ibid.*, 359–614.

³¹ *Ibid.*, 619–89.

Partch

Harry Partch's book *Genesis of a Music: An Account of a Creative Work, Its Roots and Its Fulfillments* is in many ways both a music composition treatise and a first-hand narrative of his life. Published in 1949, *Genesis of a Music* is divided loosely into four interrelated parts chronicling his life, influences, successes, philosophical ideologies, and dissatisfaction with Western music. Like Cowell and Hindemith, at the center of Partch's theory regarding materials as they relate to melody and harmony are ratios based on overtones and harmonies derived from them. But unlike his two predecessors, Partch proposed that human beings are capable of perceiving all intervals and not just an approximation of them.³² To validate this concept, Partch experimented with new temperaments and tuning systems based on ratio.

Chapter four in Part II of *Genesis of a Music* deals with the subject of intonation, a topic Partch expands upon later, in chapters 15–18. By providing mathematical ratios reminiscent of Schillinger's work, Partch illustrates his history and relevance of his microtonal system of tuning based on the principles of ratios proposed by Alexander Ellis's translations of Helmholtz's frequency data *On the Sensations of Tone*.³³ The concept of ratio and those pertaining to intonation are used as a foundation to Partch's work, and a cursory understanding is necessary for following discussions on monophony.

The subject of monophony, the third section of the book, is divided into four concepts, those pertaining to; 1) The scale of musical intervals beginning with absolute consonance, that is at a ratio of 1 to 1, and progressing to dissonance by fractions thereof. 2) The idea that every monophonic ratio has at least a dual identity consisting of the 'over' number or *Otonality* and a 'under' number or *Utonality*. 3) The *Otonality* and *Utonality* relate specifically to a facility of the human ear to discern 'major' from 'minor' simultaneously.³⁴ And finally, 4) Partch devotes the fourth section of *Genesis of a Music* to illustrate the relationships that exist between intervals, monophony, and Pythagorean theorem throughout history.

³² Harry Partch, *Genesis of a Music: An Account of a Creative Work, Its Roots and Its Fulfillments*, 2nd ed. (New York: Da Capo Press, 1974), 109-37.

³³ *Ibid.*, 446–51.

³⁴ *Ibid.*, 110.

Conclusions on Sound

Drawing on terminology that suggests music is a language, Messiaen postulates methods where harmony and rhythm are, by his account, supplementary to the melody. Messiaen describes methods for composing regardless of religious or theoretical conjecture that centers on both small and large additive-synthesis. Notes are 'added' to melodies and chords to form new sonorities, dots are 'added' to alter rhythms, and established musical concepts from around the world and throughout time are 'added' to the technique of 'his' musical language.

Cowell's and Hindemith's theories on sound both stem from the use of the overtone series. Although Cowell's application of the overtone ratio was broad, it was largely speculative. As a result, a solid theory never fully emerged. Hindemith successfully expanded Cowell's work on overtone ratio as it relates exclusively to frequency and combinations thereof. However, for an individual consumed by adherence to natural law, Hindemith lacked the open-mindedness to approach the material from other perspectives. Despite adamantly endorsing the reconciliation of modern compositional resources with tonal materials, both Cowell and Hindemith's melodic and harmonic systems were ultimately restrictive.

Schillinger and Partch opted for a different approach to sound creation. Both favored the assimilation of assorted tuning systems, intervallic divisions, and cross-cultural musical characteristics in the effort to be as comprehensive and as inclusive as possible. Schillinger's approach was theoretically based on the science and mathematics of geometric proportion. This approach produced a system of composition with a massive collection of highly complex formulae. Schillinger even attempted to quantify mood and cultural musical characteristics, a product of his theories on film scoring. Although wildly successful at the time, Schillinger failed to establish a human connection beyond that of mathematical approximation or the emulation of emotion and subsequently such formulae have faded into obscurity. On the other hand, Partch took the most open approach to the creation of melody and harmony by applying the same mathematical and scientific principles in a real and tangible way.

PART 1

Thoughts on Time

“All forms of music have one fundamental property in common: organized time”³⁵
-Schillinger

Introduction

Time, for the purpose of our examination, refers to temporal aspects of music such as duration, rhythm, meter, tempo, and form. The following is a narrative of the material, as it relates to the fundamental concept of time. Each author’s thoughts on the subject are examined individually, followed by a brief set of conclusions. Neither Hindemith nor Partch discuss the subject of rhythm. Hindemith avoids the topic entirely, and Partch’s only mention it in reference to instrument notation. Therefore, both composers will be left out of the following temporal discussion.

Messiaen

Parallel to his ideologies of melody and harmony, Messiaen’s rhythmic processes are also ‘additive’ both conceptually and temporally. Much of Messiaen’s rhythmic technique stems from an affinity for the Indian diaspora, and specifically his reliance on fundamental rhythmic practices, known as *decî-tâlas*, contained in the *Râgavardhana*, the book of Hindu rhythmic modes.³⁶ Messiaen augments and diminishes these rhythmic modes with the addition or subtraction of dots. The ensuing rhythmic complexity acted as a catalyst for Messiaen’s elimination of barlines in all signifying thematic sectional division, in favor of an environment free from the confines of meter.³⁷ Messiaen admits to other ‘ametric’ influences including *plainchant* and Stravinsky. It is interesting to note that Messiaen’s use of added values to rhythm in an ametrical environment could be seen as laying the groundwork for what we know today as temporal phase-shifting.³⁸

Messiaen’s rhythmic technique continues by exploring the nature of what he calls the “charm of (mathematical) impossibilities.” Temporally speaking “nonretrogradable

³⁵ Schillinger, Dowling, and Shaw, *Schillinger System*, 34.

³⁶ Messiaen, *My Musical Language*, 14.

³⁷ *Ibid.*, 14–15.

³⁸ *Ibid.*, 16–17.

rhythms” that is, those whose durations are exactly the same despite their orientation linear or retrograde. Yet in essence, there is no discernable difference between a nonretrogradable rhythm and the concept of a rhythmic palindrome, a concept that existed long before Messiaen’s suggested terminology.³⁹

Finally, Messiaen’s discussion of rhythm culminates with a study derived from the use of superposition. Superposition, or “layering,” of rhythms of unequal length, pedals, ositinati, and augmented/diminished values, result in a system of increasingly complex polyrhythms.⁴⁰

Cowell

Regarding time, Cowell ponders the broad implications resulting from the application of the overtone ratios on all aspects of musical duration: rhythm, tempo, meter, and form.⁴¹ When the overtone ratios are applied to the notation of time, tempo, and meter, innovations such as “rhythmic scales” are inevitable, that is, ratio based degrees of duration and temporal stress. Cowell also explores the territory of polyrhythms resulting from superimposing combinations of differing meters or tempi.⁴² Yet while he credits the inspiration for these temporal innovations to Chopin, Brahms, Scriabin, Stravinsky, and Ives, it is apparent that the vast majority of them are impractical.⁴³ Most of Cowell’s discussion about rhythm centers on the limits of current notation systems for the most complex ratio-based rhythms and proposes a system of shaped note-heads to represent them.⁴⁴

Schillinger

To Schillinger, the concept of rhythm was paramount. It formed the very core of his theory, and as such, was presented first. But creating a system based on mathematical formulae required organization methods formulated to handle them. The staff was not an option for mathematical manipulation. The graph on the other hand was made for numbers.

Book one reveals a world of highly mathematical concepts pertaining to rhythm and notation procedures that ultimately rely on graphical representation of time and

³⁹ *Ibid.*, 20–1.

⁴⁰ *Ibid.*, 22–30.

⁴¹ Cowell and Nicholls, *New Musical Resources*, 47.

⁴² *Ibid.*, 85–9.

⁴³ *Ibid.*, 108.

⁴⁴ *Ibid.*, 56–8.

space. Schillinger uses a system of geometric projection based on coordinate plotting *abscissa* (horizontal) and *ordinate* (vertical).⁴⁵ A system he uses to great effect later in the work with the incorporation of “axes of melody” where graphical representations of the temporal realm evoke sine and square waves pertaining to frequency in relation to space and time.

Schillinger also made excellent contributions to advancement of temporal association synchronization, no doubt the catalyst for facilitating great interest from the film scoring industry. But once again, his theories are inundated with complex mathematical equations describing in great detail the science behind music creation. And while Schillinger devised methods of speeding up calculations by creating devices from cardboard wheels and slide rulers, in an era without computer equipment, such calculations would still require an enormous time investment and great patience on the part of the composer. This of course brings the practicality of such a system into question.⁴⁶

Conclusions on Time

With the understanding that melodic and harmonic progression by their very nature require time as a component, one would have expected the material relating to time to be as detailed as those pertaining to sound. This, however, is not the case. Outside of remarks made in passing, neither Hindemith nor Partch discuss the musical concepts relating to time. And Messiaen’s discussion of rhythm is once again that of additive synthesis both conceptually and contextually. Schillinger and Cowell both offer temporal systems, and both are problematic. Cowell imagines the overtone ratio applied to all aspects of musical time. Ultimately his discussions on the matter are either too speculative or are expanded to such a literally absurd degree as to be only useful in pointing out the failings of the current system of notation. Schillinger on the other hand offers a very elaborate and functional system for time that is as complicated as it is impractical. Finally, it is important to note that Schillinger, Cowell, and Messiaen each in their own way, deal with the limitations of the current notation system’s ability to represent time.

⁴⁵ Schillinger, Dowling, and Shaw, *Schillinger System*, 1–25.

⁴⁶ *Ibid.*

PART 1

Thoughts on Timbre & Musicality

“Not a ratio of vibrational lengths has been put on paper nor one piece of wood glued to another which did not have its ultimate objective the creation of music.”
-Partch

Introduction

For lack of better terminology, Timbre and Musicality is a ‘catch-all’ category that is best described as everything else that goes into music making beyond sound and time. That is, timbral concepts like dynamics, articulation, instrumentation and orchestration and concepts of musicality like medium, method of delivery, style, intention and significance. The following is a narrative of the material, as it relates to the human side of music composition. Each author’s thoughts on the subject are examined individually, followed by a brief set of conclusions.

Messiaen

Messiaen acknowledges the concept of timbre but elects to avoid discussion of aspects of instrumentation or orchestration in this text entirely.⁴⁷ The only indication of an emotional attachment to the material is in a religious context. Messiaen acknowledges this context, but chooses to omit it from the work.⁴⁸

Hindemith

On the concept of timbre, Hindemith is silent. Strangely, even his analysis of Machaut, J.S. Bach, Wagner, and his own music in the final portion of book one mentions nothing of the subject.⁴⁹ As far as his thoughts on musicality, it is possible to extrapolate from the fact that Hindemith seems resolute to constantly relate his theories to

⁴⁷ Messiaen, *My Musical Language*, 7.

⁴⁸ *Ibid.*, 8.

⁴⁹ Hindemith, *Craft of Musical Composition*, 202–23.

the natural human ability to perceive them. This tendency shows that Hindemith is concerned about the role the listener.

Cowell

Just like his thought on melody, harmony, and rhythm, Cowell suggests a correlation between the overtones and timbre. On this subject, Cowell remains brief but intriguing. He suggests more study be done on tone quality with different relations of dynamics to overtone series.⁵⁰ Cowell even goes on to acknowledge the limitations in the current notation of dynamic notation, and contemplates the advantage of a system that allows for precise control of the “degrees of stress.”⁵¹ On the subject of orchestration Cowell gives the example that the sounds produced by the combination of a flute, whose odd number overtones are more prominent, with a clarinet, whose even number overtones are more prominent, reinforce each other to create a complete series when played together.⁵²

While he does not expressly discuss the topic of musicality, like Hindemith, Cowell is aware of the listener’s perception of music. *New Musical Resources* concludes with one final thought on the subject...

*“For the sake of the exquisiteness of emotion ...there is a place for the formalization and co-ordination of different contemporary musical resources by means of their common relationship with the overtone series, which although it forms a mathematical, acoustical, and historical gauge, is not merely a matter of arithmetic, theory, and pedantry, but is itself a living essence from which musicality springs.”*⁵³

Schillinger

In the quest to provide the first unified system of musical theory, Schillinger’s elaborate treatise does not shy away from the timbral concepts of instrumentation or orchestration. Instead, Schillinger fully embraces these timbral aspects of composition and dedicates the final book to the topic.⁵⁴ Schillinger even includes instrumentation and

⁵⁰ Cowell and Nicholls, *New Musical Resources*, 32–35.

⁵¹ *Ibid.*, 81–3.

⁵² *Ibid.*, 32–5.

⁵³ *Ibid.*, 138–9.

⁵⁴ Schillinger, Dowling, and Shaw, *Schillinger System*, 1485–605.

orchestration information of instruments that were cutting edge for the time, such as the Hammonds' solovox, the RCA's novachord, two of the first commercially available synthesizers. This was quite revolutionary at the time, but of course has become outdated over the 64 years since it was first published.

On the topic of musicality however, Schillinger offered a logically extreme attempt to quantify emotion and reduce musical characteristics from cultures around the world into mathematical equations. And while this theory was groundbreaking, it succeeded only by returning culturally stereotypical associations and approximations of emotion.

Partch

While Partch was creative as far as notation, form, and philosophy are concerned, his real compositional contributions were the result of the manifestation of timbre and musicality. Partch designed, built and composed for a multitude of his own original instruments. The instruments that he spent his life creating were designed to reflect his theoretical ideas on composition.

It is not surprising to learn nearly all of the instruments Partch invented were percussive, microtonal, and monophonic. Moreover, the instruments themselves were designed to be aesthetically dramatic. Several of the more unique instruments include: The *Chromelodean*, Partch's version of a pipe organ, renovated and retuned from equal temperament to produce all the microtones in an octave. The *Kithara*, a type of vertical harp-like stringed instrument based on an ancient version of the same name, which are used to produce specific fundamental tones and overtones by vibrating against glass tubes inserted between strings. The *Harmonic Cannon*, another stringed instrument, features an inclined dulcimer-like soundboard and movable bridges allowing the tuning to be easily adjusted. The blocks of Partch's *Diamond Marimba* are arranged in a way that the *Otonalities and Utonalities* are juxtaposed in a horizontal and vertical manner allowing the player to easily play linearly microtonal and major/minor arpeggios with a quick drag of the wrist. These readily identifiable vestiges of traditional instruments are not the only instruments Partch created. More exotic instruments include those of indefinite pitch such as the *gourd tree* and *cone gongs*, and other mallet-based instruments such as the *eucal blossom*, *zymo-xyl*, and the *boo*.

On the subject of musicality, Partch offers a creatively extreme perspective. The entire treatise begins with a carefully constructed musicological narrative pitting the forces of the Corporeal against the Abstract. Partch viewed the Corporeal as the human side of the creative process. That is, the ‘spirit’ of the music. He went on to explain that processes designed to favor virtuosity and refinement undermine the ‘spirit’ of the music and push it inexorably towards meaningless abstraction. To Partch, Corporeality was the ultimate musical objective, acoustics was his method, and philosophy his muse.

Conclusions on Timbre and Musicality

Hindemith and Messiaen acknowledge the concepts of timbre and musicality, yet both actively avoid a discussion altogether. Cowell mentions the necessity of more work being done in the area of overtones and timbre, but offers no elaboration. Perhaps this is an area of research that could stand to use some attention. Schillinger and Partch offer two extreme perspectives on the topics of timbre and musicality. Although several of Schillinger’s logically extreme concepts on the subject were at the time quite unique, they become obsolete when the rest of his system fell into disuse. Partch on the other hand, offered a creatively extreme perspective through the creation of new instruments and the championing of the philosophy of Corporeality. Yet, like Schillinger, Partch’s method was too inaccessible to gain mass appeal. Mysterious as they can be, the areas of timbre and musicality could stand to use some attention. Perhaps answers can be found not in the extremes of logic or creativity, but somewhere in between.

PART 2

Composition Lessons

“Originality cannot be a goal. It is simply inevitable.”⁵⁵
-Partch

Introduction

There are a number of composition lessons to be learned from these texts. Some lessons are methodological, others philosophical. Sometimes good lessons lay in what the authors say, others more so in what is left unsaid. In the effort to tease out ‘pearls of wisdom’ from these texts, it helps to approach this inquiry by determining problems composers face with writing new music. These problems fall into one of three categories, each corresponding to the basic principles of music. 1) The generation of ideas. 2) The development of ideas and 3) Shaping the music.

1) Idea Generation	2) Development of Ideas	3) Shaping the Music
SOUND	TIME	TIMBRE & MUSICALITY

The problem of idea generation rests with inspiration. Each of these texts offers at least one technique that can inspire the generation of ideas. For example, Hindemith’s methodologies for generating a harmonic language, Schillinger’s systems to devise new rhythms, Messiaen’s unabashed appropriating of material from outside⁵⁶ sources, Partch’s creativity, and Cowell’s sense of adventure are all inspiring lessons to be learned.

The second problem composers face with the creation of new music is how to develop ideas. The answer to this problem rests with variation. Once again, each text

⁵⁵ Partch, *Genesis of a Music*.

⁵⁶ Double entendre intended ☺.

offers the opportunity to learn one lesson about variation, whether harmonic, rhythmic or timbral. Cowell was a proponent of variation in recognizable meter as a means to keep the listener engaged and argued that disguising metric accent by shifting phrases leads to aural confusion.⁵⁷ Hindemith's devises harmonic degree progression controlled by fluctuation of tension to add variety. Similarly Schillinger's harmonic progression determined by geometric projection is a means of variation.⁵⁸ Partch's immense timbral variation and Messiaen's idea of ametrical music and added rhythms are other ways to address the issue of elongating and varying ideas.⁵⁹

The final problem composers face when creating new music is how to shape the music to fit the need. This may refer to instrumentation or orchestration, style or significance. Schillinger offers several theories that discuss the problem, namely the emulation of styles based on pitch and harmony adaptations and the manipulation of a "psychological" dial to reflect mood change.⁶⁰ Messiaen was not opposed to the incorporation of traditional forms of *plainchant*, Mass, and sonata, as well as readily established procedures such as fugue. Cowell and Hindemith illuminate the concept of dissonant counterpoint as a stylistic tool by reversing the concept of structural dissonant resolution.⁶¹ Partch, meanwhile, reminds us of the necessity of corporeality and flair for the dramatic.

Of course, not one of these texts boasts a complete method for composing music. Schillinger made a valiant effort, but is such a universal system even achievable? Each text is not without its faults and limitations when employed individually. Instead, what these texts offer collectively is a *'palette'* of some possible *'colors'* from which composers may choose to *'paint'* their music, not instructions on *'how to paint.'*

⁵⁷ Cowell and Nicholls, *New Musical Resources*, 71.

⁵⁸ Schillinger, Dowling, and Shaw, *Schillinger System*, ??.

⁵⁹ Messiaen, *My Musical Language*, ??.

⁶⁰ Schillinger, Dowling, and Shaw, *Schillinger System*, ??.

⁶¹ Cowell and Nicholls, *New Musical Resources*, 35–42.

PART 3

Essential Values

“There is no denying the fact that to learn a new system takes time and trouble. But if one gains a wider outlook and a more complete mastery, it is worth it... No one is too able or too accomplished to learn more than he knows.”

-Hindemith

Introduction

The last section of this document is an attempt to come to terms with the essential value of each text and suggested modern practical application thereof. This section, and this response, concludes with some final thoughts on the subject of composition in the 20th and 21st centuries.

Cowell

While from a composer’s perspective, it is interesting to see the extent a system of composition could be based on one underlying concept so simple and natural as that of the overtone series, the true value of *New Musical Resources* is in its acknowledgment of the limitations of the current system of notation, a system that has had little lasting and commonplace innovation for the better part of 500 years. Whether Cowell’s system is a compositional aid or analytical tool is debatable. What is not debatable is the fact that the 20th century saw advancement and innovations with the elements of music to the point of abstract complexity, and lest a “neo-neo-classical” tendency for style should arise, the 21st century will see these complexities expand exponentially as the inevitable byproduct as next group of budding composers embark on their quest to differentiate themselves from others. That being said, the system of notation is in desperate need of an overhaul. Composers or theorists would undoubtedly find fertile ground should they take on such a daunting task.

Hindemith

While the first book of *Craft of Musical Composition* is interesting, and offers the modern composer options in the creation of a harmonic language, book II is probably of the most importance to a modern composer. The second book is entirely devoted to exercises in two-part writing. It does represent the first really innovative approach to counterpoint since Fux's *Gradus ad Parnassum*. These exercises are not intended for the beginner, and presuppose that the student has a thorough background in theory and ear-training. It is unfortunate that Hindemith never completed the continuation of the series he hints at which would contain more advanced concepts and setting exercises. Perhaps, with careful study, this treatise could inspire a continuation by an adventurous composer.

Messiaen

Messiaen was not opposed to the assimilation and offers only an account of some techniques he used with an eclectic collection of practices to establish a style long codified. *The Technique of My Musical Language* is not an elaborate attempt at the creation of a comprehensive system of composition. It does not pretend to be able to provide the composer with a paint-by-numbers approach to music nor does it promise profound insights into the deepest recesses of the art. Perhaps the value of this book is in what it is not. A lack of information can signify a wealth of opportunity to a creative mind.

Schillinger

Joseph Schillinger's monumental work *The Schillinger System of Music Composition* is incredibly complicated and requires a level of mathematical expertise in order to facilitate a real understanding of the material. Yet Cowell described Schillinger as having "done for music, what Mendel did for chemistry." In other words, Schillinger provided the composer with a palette of possibilities and the formulae to use them. The problem is that this system is far too tedious to be practical. Perhaps Schillinger was ahead of his time. Perhaps an enterprising mind, armed with advancements in computer technology, could revisit the work.

Partch

Largely self-taught and geographically isolated, Partch happily utilized the tools at hand to carve a place among the most inspirational minds. *Genesis of a Music* stands as a passionate reminder of the power of the human spirit and humanity's desire to create.

Part personal narrative, part treatise on composition, Partch distinguished himself from others in the field by his rejection of established traditions. If a composer should learn nothing else from this text, it is to never try to be something s/he is not, to question everything, and to relentlessly pursue individuality.

Final Thoughts

The 20th Century saw the invention of a plethora of new technologies and as a result, an explosion in the number of individuals who devoted their careers to music composition. The advancement of recording technology provided composers with a multitude of new outlets for their work. As the number of these outlets increased so too did the audiences attraction to them. Consequently, composers like Schillinger tailored their compositions to fulfill the specific demands of the corresponding audience. The commercial use of music as a commodity facilitated many inspiring composers to become both socially and economically successful. On the other hand, financial stability and support from the academic community offered composers like Cowell and Hindemith the opportunity to experiment with music creation and sound synthesis. Some composers like Messiaen sought to breathe new life into established concepts and re-invent compositional techniques. Others like Schillinger developed a rigorously complex system and language to explain the mathematical and scientific relationships of time and frequency. Still others like Partch formed entirely new instruments and notation practices in an attempt to “break the mold” altogether. Regardless of how different their approach may be from one another, ultimately the goal of each composer is to achieve stylistic independence and differentiate one’s self from one’s predecessors, while actively seeking to mature the level of interaction with the audience.

In the 21st century, improved cultural understanding, educational development, enhanced technology, and merging social identities have altered the way in which we consume music. With the proliferation of technology and digital media and Internet communications composers today are more connected than ever before. Technology has generally made composition more accessible. Yet as the number of individuals pursuing a career in composition increases, so to does the individual composer’s pressure to differentiate his or herself from others. If nothing else, understanding the principles contained in these texts will allow the modern composer to identify with the music on a more intimate level and enrich the processes of composition.

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