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**The Identity, Application and Legacy of Paul Hindemith's  
Theory of Music**

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## Abstract

### The Identity, Application and Legacy of Paul Hindemith's Theory of Music

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This thesis investigates the relationship between Hindemith's music theory and his evolving compositional practice. It focuses on the first volume of his *Unterweisung im Tonsatz* (1937); both evaluating the very identity of the treatise and analysing how it may be applied to free composition. Above all, this work highlights the increased use of quartal pitch collections found in Hindemith's *Unterweisung*-based compositions. Archival documents from the universities of Yale, Berlin, Buffalo, and the Frankfurt Hindemith Institute augment this process, and are used to revise our understanding of how Hindemith's music theory originated, and how it relates to his practice and teaching.

The dissertation begins by exploring the theoretical and intellectual climate of the Rundfunkversuchsstelle at the Berlin Hochschule für Musik within a critical commentary of Hindemith's music theory. It then develops a new theoretical perspective of quartal pitch space, and atonal prolongation, to provide an analytical toolkit. The list of compositions in the *Unterweisung* appendix, which Hindemith felt most successfully demonstrated his theory in practice, structures the next three chapters. The *Sonata for Solo Viola* op. 25/1, a pre-*Unterweisung* composition, is followed by the *Ludus Tonalis*, which was published soon afterwards, which is investigated for its explicit theoretical connections. The third analytical chapter focuses on the *Das Marienleben* cycle as a work written before the *Unterweisung*, and subsequently revised with theoretical concerns.

The final two chapters investigate the prominent decline in popularity experienced by Hindemith, both regarding his theory and compositions, from the 1950s. This is epitomised by a number of strongly-worded polemics published in *The Music Review*, much of which, it may be argued, is inaccurate or unduly critical. The thesis ends by constructing a Hindemith legacy based on a selection of archival documents and scores, together with a selection of trends in composition and music theory.

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## Chapter 1: Introduction

### 1.1 Setting the scene

Not all composers are theorists, and fewer still publish theoretical textbooks. Of these few, the connection between their music and theory varies: Johann Joseph Fux wrote music in a mature Baroque style, yet his theory codified the polyphonic practice of Giovanni Pierluigi da Palestrina. The Austrian thorough-bass theorists wrote practical treatises that reflected their own harmonic agendas, such as Johann Georg Albrechtsberger, Simon Sechter and Anton Bruckner.<sup>1</sup> The French composer Jean-Philippe Rameau similarly wrote a thorough-bass treatise, although the first part speculatively justifies the diatonic system using the overtone series. The German theorist Hugo Riemann took Rameau's speculative application one step further and invented harmonic dualism to objectify the minor mode.<sup>2</sup> Some composer-theorists were prominent composers in their lifetimes. Many were not.

Against this backdrop is a rare occurrence of a composer who turned to the writing of music theory textbooks as a way of streamlining his own compositional style: Paul Hindemith (1895-1963). He has been classed among the great composers of the early twentieth century, alongside Bartók, Schoenberg and Stravinsky, and yet his legacy and music theory remain enigmatic.<sup>3</sup> Unlike Schoenberg, who wrote textbooks to observe features of earlier, diatonic music, Hindemith created a speculative music theory that offered a direction for contemporary composition to follow which did not sever its ties with tonality, and yet used the chromatic scale. He entitled it *Unterweisung im Tonsatz*.

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<sup>1</sup> See Wason, Robert W., *Viennese Harmonic Theory from Albrechtsberger to Schenker and Schoenberg* (New York: University of Rochester Press, 1985).

<sup>2</sup> See Rehding, Alexander, *Hugo Riemann and the Birth of Modern Musical Thought* (Cambridge: Cambridge University Press, 2003).

<sup>3</sup> For example, see Lampert, V., Somfai, L., White, E. W., Noble, J., Kemp, I., *New Grove Modern Masters: Bartók, Stravinsky, Hindemith* (New York: W. W. Norton & Co., 1984).

Hindemith's committed engagement with music theory is, further, unusual given his early popularity as a performer and a composer. His initial achievements in performance included entering the Frankfurt Opera Orchestra aged 19, and subsequently playing in the Rebner and Amar String Quartets. The status of his technical prowess as a viola soloist was elevated to the highest international standing during the 1930s, where he premiered his three viola concertos and, in addition, William Walton's *Viola Concerto* at short notice.<sup>4</sup> Hindemith performed his viola concertos with some of the leading musicians and ensembles of the twentieth century: for example, his *Fifth Kammermusik* was premiered in November 1927 with the Berlin Staatskapelle under Otto Klemperer. Furthermore, these were not isolated performances; Ian Kemp reports that, by 1938, Hindemith had played the *Kammermusik* ninety times.<sup>5</sup>

Many composer-theorists turned to theory after their works received limited popularity or attention. This was not the case for Hindemith: by the mid-1920s, he was widely regarded as the leading living German composer. This was due in part to the success of three modernist one-act operas (*Mörder, Hoffnung der Frauen, Das Nusch-Nuschi* and *Sancta Susanna*), five *String Quartets* and the *Kammermusiken*. He also held an influential director position at the Donaueschingen music festival, which was to become the prominent Baden-Baden festival, and from 1 July 1919 he had the support of the publisher Schott & Co. He was considered to be the ideal candidate to continue the line of German New Music after the death of Max Reger in 1916.<sup>6</sup>

Hindemith published the first instalment of his music theory at the age of 41, in June-July 1937. Before this date, he had written in excess of 103 compositions, which included a wide range of

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<sup>4</sup> William Walton's *Viola Concerto* was to be premiered in 1929 by Lionel Tertis, who declined the work. Hindemith stepped in to give the premiere performance, at a Henry Wood Promenade Concert on 3 October 1929, conducted by Walton.

<sup>5</sup> Kemp, Ian, 'Some Thoughts on Hindemith's Viola Concertos' *Hindemith Jahrbuch* [henceforth *HJb*] No. 35 (Mainz: Schott & Co., 2006) p. 69.

<sup>6</sup> Kemp, Ian, *Hindemith* (London: Oxford University Press, 1970) p. 7.

genres from opera and an oratorio to orchestral and instrumental works.<sup>7</sup> Afterwards he wrote at least 75 compositions, in addition to a large number of canons and compositions for amateurs (*Sing-und-Spielmusik*). His theory-making therefore occurred in a middle period of his compositional life. This chronology offers an opportunity to analyse the connection of Hindemith's music theory to his compositions which may rarely be found in other composers, particularly of international standing.

He has been described by Geoffrey Skelton, the first to publish a biography of Hindemith in the English language, as reaching artistic and technical maturity during this period.<sup>8</sup> That this occurred alongside the *Unterweisung* is no coincidence. Skelton makes the point that Hindemith was keen to remove the element of chance in the process of composition – ‘the variation of quality brought on by an over-reliance on artistic inspiration’ – and arrive at a complete control of his ‘craft’. He concludes that it was ‘an essential part of the process of Hindemith getting to know and understand himself.’<sup>9</sup> This interpretation offers a curious facet to the *Unterweisung*: it may have been as much about Hindemith consolidating his own craft, and getting to know his own methods, as about teaching others. The complex, and in many ways chaotic, compositional environment of 1920s Germany, and the pluralistic nature of Hindemith's music from this time, invited a thinker to create order in an increasingly multifarious musical language.

The unique relationship of Hindemith's musical compositions and musical theory opens up rich possibilities for investigation, which are central to this thesis. For example, what elements of the

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<sup>7</sup> The breakdown of works before June 1937 include: 11 stages works, 20 orchestral works, 1 oratorio, 6 unaccompanied choral works, 7 works for solo voice and orchestra, 14 works for solo voice and piano, 11 chamber works for 3 or more instruments, 21 chamber works for 1 to 2 instruments, and 12 works for keyboard. There are numerous other fragments, lost works, works for mechanical instruments, miscellaneous dramatic music, film scores, incidental music, and music for amateurs. After June 1937 Hindemith's works include: 4 stage works, 18 orchestral works, 1 requiem and 4 other works for choir and ensemble, 8 unaccompanied choral works, 1 work for solo voice with orchestra, 11 works for solo voice and piano, 6 chamber works for 3 or more instruments, 16 chamber works for 1 or 2 instruments, 6 works for keyboard.

<sup>8</sup> Skelton, Geoffrey, *Paul Hindemith: the Man behind the Music* (London: Gollancz, 1975) p. 143.

<sup>9</sup> *Ibid.*, p. 143.

*Unterweisung* are applicable to free composition? And of these components, which have had the greatest impact upon Hindemith's musical language, particularly given the chronological placement of Hindemith's theoretical work during his compositional activity? The results provide a context for Hindemith's compositional legacy.

## 1.2 Source Material

Hindemith wrote at least seven theoretical and pedagogical textbooks, many of which are published by Schott & Co., and have enjoyed several re-printings. Following Hindemith's move from Germany to the USA during 1937, the original language of some of his texts switched to English. However, they were still then translated back to German, which is testament to his popularity after the Second World War. In the order of publication these include:

1. *Unterweisung im Tonsatz – Theoretische Teil* (Mainz: Schott & Co., first ed. 1937, second ed. 1940)  
*The Craft of Musical Composition* trans. Mendel, Arthur (Mainz: Schott & Co., 1942)
2. *Unterweisung im Tonsatz – Übungsbuch für den zweistimmigen Satz* (Mainz: Schott & Co., 1941)  
*The Craft of Musical Composition – Exercises in Two-Part Writing* trans. Ortmann, Otto (Mainz: Schott & Co., 1939)
3. *Unterweisung im Tonsatz – Übungsbuch für den dreistimmigen Satz* ed. Briner, A., Meyer, P. D. & Rubeli, A. (Mainz: Schott & Co., 1970)
4. *A Concentrated Course in Traditional Harmony* Vol. 1 (Mainz: Schott & Co., 1943)  
*Aufgaben für Harmonie-Schüler* trans. anon [probably Hindemith] (Mainz: Schott & Co., 1949)
5. *Elementary Training for Musicians* (Mainz: Schott & Co., 1946)
6. *Harmonie-Übungen für Fortgeschrittene* (Mainz: Schott & Co., 1949)  
*A Concentrated Course in Traditional Harmony Vol. 2: Exercises for Advanced Students* trans. anon [probably Hindemith] (Mainz: Schott & Co., 1953)
7. *A Composer's World: Horizons and Limitations* (Cambridge: Harvard University Press, 1952)  
*Komponist in seiner Welt* trans. Hindemith, Paul (Mainz: Schott & Co., 1959)

The 1937 German *Unterweisung* edition ended with an appendix listing compositions by Hindemith which best represent his theory in practice. This document, which was omitted from future editions, is quoted below:<sup>10</sup>

Die Verwirklichung der in diesem Buche vorgetragenen Ansichten über die Technik des Tonsatzes läßt sich am besten in den nachstehenden Werken des Verfassers verfolgen:

[The realization of the views presented in this book on the technique of composition can best be observed in the following works by the author:]

Sonate in Es für Violine und Klavier, op. 11<sup>1</sup> (1920)  
Sonate für Bratsche und Klavier, op. 11<sup>4</sup> (1922)  
Streichquartett, op. 22 (1922)  
Die junge Magd. Sechs Gedichte von Georg Trakl für eine Altstimme mit Flöte, Klarinette und Streichquartett, op. 23<sup>2</sup> (1922)  
Kleine Kammermusik für 5 Bläser (Flöte, Oboe, Klarinette, Horn und Fagott) op. 24<sup>2</sup> (1922)  
Sonate für Bratschen allein, op. 25<sup>1</sup> (1923)  
Sonate für Viola d'amour und Klavier, op. 25<sup>2</sup> (1929)  
Sonate für Violoncell allein, op. 25<sup>3</sup> (1923)  
Fünf Stücke in der ersten Lage für Streichorchester, op. 44<sup>4</sup> (1927)  
Frau Musica. Musik zum Singen und Spielen nach einem Text von Luther, op. 45<sup>1</sup> (1928)  
Konzertmusik für Solobratsche und größeres Kammerorchester, op. 48 (1930)  
Konzertmusik für Klavier, Blechbläser und Harfen, op. 49 (1931)  
Konzertmusik für Streichorchester und Blechbläser, op. 50 (1931)  
Das Unaufhörliche. Oratorium nach einem Text von Gottfried Benn für Soli, gemischten Chor, Knabenchor und Orchester (1931)  
Plöner Musiktag. Musik zum Singen und Spielen: A. Morgenmusik, B. Tafelmusik, C. Kantate, D. Abendkonzert (1932)  
Philharmonisches Konzert. Variationen für Orchester (1932)  
Trio Nr. 2 für Violine, Bratsche und Violoncell (1933)  
Symphonie Mathis der Maler für Orchester (1934)  
Mathis der Maler. Oper in sieben Bildern (1934)  
Der Schwanendreher. Konzert nach alten Volksliedern für Bratsche und kleines Orchester (1935)  
Sonate in E für Violine und Klavier (1935)  
Trauermusik für Bratsche und Streichorchester (1936)  
Drei Sonaten für Klavier (1936)  
Sonate für Flöte und Klavier

Als praktische Erläuterung wird ferner eine Neufassung des 1924 erschienenen "Marienleben" (Gedichte von Rainer Maria Rilke) und des "Liederbuches für mehrere Singstimmen" (1925) veröffentlicht werden. Das im Text wiederholt erwähnte Übungsbuch erscheint, sobald die bei der Verwendung des theoretischen Teils gemachten Erfahrungen es gestatten.

[As a practical demonstration, a new version of the 1924 published "Marienleben" (poems by Rainer Maria Rilke) and the "Liederbuches für mehrere Singstimmen" (1925) will also be published. The workbook that has been repeatedly mentioned in the text will appear as soon as the experience gained from the use of the theoretical part permits it.]

This thesis uses the appendix to create the following three categories, which form the analytical basis of chapters four, five and six:

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<sup>10</sup> Because the appendix was left out of the second edition of the *Unterweisung* in 1940, it failed to make the journey into Mendel's translation in 1942. For this reason, it has been overlooked in many studies of Hindemith's music theory in the English language.

1. music written before the *Unterweisung*, and yet quoted in the appendix
2. music written immediately after the *Unterweisung*, such as the *Ludus Tonalis* (1942)
3. music written before the *Unterweisung* but subsequently revised as a corollary of his theory, such as *Das Marienleben* (1923 revised 1948)

In addition to the chronological placement of Hindemith's compositions and theory, there is a corpus of rich documents which give reference to his theory and practice. These include:

1. *Unterweisung* drafts
2. *Unterweisung* appendix
3. *Das Marienleben* foreword
4. Hindemith Institute, Frankfurt am Main
5. Yale Hindemith Collection
6. Blonay Bibliothek
7. Thomas Hall Collection
  - a. Correspondence with Arthur Mendel
  - b. Edward Ballantine, *Variations on Mary Had a Little Lamb*
8. University libraries at Buffalo, Berkeley and Berlin
9. Rebner and Amar String Quartet Programmes
10. Continuing expansion of the Hindemith Complete Edition

Giselher Schubert (1980) has examined Hindemith's *Unterweisung* drafts from 1935-7, although a detailed examination of the (significant) alterations between the published 1937 and 1940 versions is still needed.<sup>11</sup> The *Unterweisung* appendix is an exceptional document, although it is often overlooked. The foreword to Hindemith's *Das Marienleben* is also overlooked because of the scarcity of the English translation. It is widely available in German, as the front to the Schott publication of the 1948 revised version, although no translation is provided. For this, one must look to a separately-published English translation (Schott & Co., 1948), which is poorly disseminated; at the time of this thesis, there was not a single copy in the United Kingdom. The foreword is a valuable document, perhaps even more so than the *Unterweisung*, for investigating the relationship between Hindemith's theory and compositional practice. Following Hindemith's death in 1963, two international research centres were founded: the Hindemith Institute, Frankfurt am Main, and the Yale Hindemith Collection. Between them they hold the majority of Hindemith autographs and correspondences. Frankfurt retains archival ties with Schott Music,

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<sup>11</sup> Schubert, Giselher, 'Vorgeschichte und Entstehung der "Unterweisung im Tonsatz: Theoretischer Teil"' *HJb* Vol. 9 (Mainz: Schott & Co., 1980) pp. 16-64

and publishes an ongoing collected works edition (*Hindemith Sämtliche Werke*), a journal (*Hindemith Jahrbuch*) and pamphlet (*Hindemith Forum*). It is also affiliated with the Paul Hindemith Prize in composition at the Schleswig-Holstein Music Festival (since 1990) and the Paul Hindemith Prize of the City of Hanau (since 2000). The Blonay Bibliothek is a paper resource held within the Institute, which records the various books and papers owned by Hindemith in his personal library. These books are stored in a Hindemith Library in Blonay, Switzerland. It contains valuable information about the theoretical books Hindemith was interested in, and includes details on those that he dated and annotated. Within the Yale Hindemith Collection, there are several thousand pages of primary source material. Access is facilitated by an online catalogue. Furthermore, the Yale archive catalogue system keeps archives for all its notable alumni and staff. For example, an annotated score by one of Hindemith's students, Charles Shackford, is held not in the Hindemith collection, but in a Charles Shackford Collection. Within the Yale Collection is a collection of manuscripts entitled 'Thomas Hall'. These contain material such as Arthur Mendel correspondences and the unpublished score of Edward Ballantine's 'Mary Had a Little Lamb' variations, in the style of Hindemith.

Much of this material appears perhaps for the first time in this thesis, lending a new perspective on Hindemith's music theory. These include:

1. Class notes from Hindemith's students at Yale
2. Hindemith's corrections to student compositions
3. Letters and correspondences, particularly concerning Arthur Mendel and the *Unterweisung* translation
4. 'Blackboard' fugue fragments recorded by students in Buffalo and Yale
5. Sections from the autograph score of *Sonata for Solo Viola* op. 25/1
6. The connection of Hindemith's source material to his Blonay library
7. Unpublished documents referring to Hindemith's work in the Berlin Rundfunkversuchsstelle

The chronological placement of Hindemith's music theory within his compositional activity; the *Unterweisung* appendix; the compositional revisions and the classroom teaching, all invite an investigation into the relationship between Hindemith's theory and practice.

### 1.3 The Current State of Hindemith Research

The two main texts that relate Hindemith's theory to his compositional practice are Ian Kemp, *Hindemith* (London: Oxford University Press, 1970) and David Neumeyer, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986). Kemp's text is sixth in the *Oxford Studies of Composers* series, edited by Colin Mason, which also includes monographs on Fux, Monteverdi, Cherubini, Tallis and Schoenberg: save for the latter, these were composers who had been quantitatively marginalised in musicological publications at that time. As Kemp's book was published only seven years after Hindemith's death, it allowed him to take advice from Gertrud Hindemith (who died in 1967) and therefore includes valuable perspectives. Moreover, Kemp published, for the first time, many anecdotes from Schott's Hindemith archive, which was to become part of the Hindemith Institute.

Kemp both introduces the central *Unterweisung* concepts, and offers a brief application. Notable strengths include his discussion of pitch centres from Hindemith's *Mathis der Maler* Symphony, and his application of Hindemith's analytical principles in graph form.<sup>12</sup> However Kemp's text is concise at only 59 pages in length. It therefore leaves many areas for investigation. These include most notably the analysis of complete scores, rather than segments; critical engagement with Hindemith's theoretical methods; and an *Unterweisung* reception history.

This thesis is indebted to the work of Neumeyer, whose 1986 monograph is the major study of Hindemith's music theory and compositions. It is part of the *Composers of the Twentieth Century*

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<sup>12</sup> Kemp, Ian, *Hindemith* (London: Oxford University Press, 1970) pp. 35-9.

*Series*, edited by Allen Forte (Neumeyer's doctoral supervisor), which also includes monographs on Scriabin, Varèse and Stravinsky. The book is structured in four parts: (1) preliminaries on theory, composition and analysis; (2) *Mathis der Maler*; (3) music before *Mathis*; and (4) music after *Mathis*. Neumeyer therefore associates *Mathis* (1933-5) with a stylistic watershed in Hindemith's music. It is the seminal text on Hindemith, both for its analytical depth and reference to Hindemith's theoretical and compositional sketches.

Neumeyer similarly analyses Hindemith's *Das Marienleben* and *Ludus Tonalis*, which is unsurprising given the theoretical context surrounding them. However, this thesis differs from Neumeyer in three fundamental ways. Firstly, it does not consider the third *Unterweisung* volume as an accurate document of Hindemith's theoretical position. One of the reasons for this is precisely due to the doubts that Hindemith had when writing it. Hindemith certainly intended to add volumes in three- and four-part writing immediately following the publication of the first two volumes; whether the posthumous third volume truly represents this, however, is unclear. This matter is expanded upon in chapter three. Secondly, the method in this thesis is original and wholly unrelated. Neumeyer does not investigate the theoretical potential of quartal pitch systems, nor their close relationship to Hindemith's theoretical writing, choosing instead to invent an elaborate inventory of symbols based on the third *Unterweisung* volume. Indeed, Stephen Hinton finds it expressed as 'a series of hieroglyphics which is imprecise and tends to confuse rather than enlighten'.<sup>13</sup> Thirdly, Neumeyer does not use Hindemith's *Unterweisung* appendix to the extent I do here.

It has been over 25 years since Neumeyer's monograph. In the meantime, there have been no detailed examinations of the relationship between Hindemith's theory and composition in the English language, which have not been the complement of a doctoral degree in performance

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<sup>13</sup> Hinton, Stephen, review of Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) *Music Analysis* Vol. 7, No. 3 (Oct., 1988) pp. 356-359.

(DMA). Since then, many unpublished documents have come to light, such as the Yale Thomas Hall Collection and material from the Berlin University of the Arts. Secondary material used in this thesis, published since Neumeier's monograph, includes complete repertoire lists for the Rebner and Amar String Quartets (1991-3), a succession of dedicated Hindemith articles in the *Journal of Musicology*, and a Hindemith monograph in Danish by Niels Viggo Bentzon (1997).

The analytical method developed in this thesis is indebted to post-tonal prolongation models by Joseph Straus (1987) and Fred Lerdahl (1989 and 2001). Earlier concepts of atonal prolongation may be traced to Felix Salzer (1952), and Robert Morgan (1976).<sup>14</sup> In these forms, it exists as an ironic consequence of Schenker's tonal reductive technique, applied liberally to diverse music examples from Machaut to Bartók and Stravinsky. Straus advises caution concerning the range of repertoire that prolongation is applied to, and adds four conditions to define and enhance the theoretical definition of prolongation. A sensitivity towards pitch salience, discussed by Lerdahl, is added to express precisely why certain pitches are more prominent than others, and may therefore be subject to prolongation. This thesis is particularly concerned with the prolongation of Hindemith's quartal pitch collections, as an expression of *Unterweisung* theory.

Apart from the two monographs by Kemp and Neumeier, which are out of print, detailed and committed studies of the close relationship between Hindemith's music and theory are surprisingly few. The overwhelming majority of texts that attempt to relate Hindemith's *Unterweisung* to his compositional process are DMA doctoral theses in performance. The *Trumpet Sonata* (1939) has already earned six complete dissertations, perhaps due to its proximity to the publication of *Unterweisung* in 1937.<sup>15</sup> There is a short and rudimentary application of the

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<sup>14</sup> Salzer, Felix, *Structural Hearing* (New York: C. Boni, 1952) and Morgan, Robert P., 'Dissonant Prolongation: Theoretical and Compositional Precedents' *Journal of Music Theory* Vol. 20 No. 1 (Spring, 1976) pp. 49-91.

<sup>15</sup> These include Morton, P., 'The influence of Paul Hindemith's *The Craft of Musical Composition* on his sonata for trumpet in B-flat and piano' (University of Alabama: DMA, 1995), Bogard, R., 'The trumpet in selected solo and chamber works of Paul Hindemith: Elements of trumpet technique and their relationship to the Gebrauchsmusik

*Unterweisung* to Hindemith's *Third Piano Sonata* by Radoslavova (2006), and more general analysis by Thurston (1984), in addition to studies of Hindemith's chamber music, which focus on the output from the 1930s.<sup>16</sup> These include his *Sonata for Harp* (Poeschl-Edrich, 2005), *Viola* (Whang, 2005), *Flute* (Ohlsson, 1975), *Clarinet* (Townend, 1967), *Bassoon* (Koper, 1972) and *Trombone* (Walter, 1996).<sup>17</sup> As the DMA degree includes a substantial performance component, the analytical discussion of the music is usually brief and relates the *Unterweisung* to each composition by its chronological connection rather than on how the music itself may demonstrate Hindemith's theoretical ideas.

The notable biographical material includes Andres Briner (1971), Geoffrey Skelton (1975), Luther Noss (1989) and Guy Rickards (1995). They provide useful documentary evidence, although do not investigate the specific relationship of Hindemith's theory and compositional practice. Noss is noteworthy as one of the few authors to present material from the Yale Hindemith Collection, including valuable information for this thesis, such as Hindemith's student lists. Routledge's prominent music bibliography series is yet to attempt an edition on many mainstream Western composers, such as Monteverdi, Beethoven, Mozart or Stravinsky.

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concept' (University of North Texas: DMA, 1994), Retzlaff, C., 'World War II symbolism and programmatic content in Paul Hindemith's Sonata for Trumpet and Piano' (California State University: DMA, 2008) and, more loosely, Cox, B., 'Selected chamber compositions of Paul Hindemith employing trumpet: A stylistic and performance analysis.' (University of Southern Mississippi: DMA, 1995), Toering, R., 'A performance interpretation of the Sonata for Trumpet and Piano by Donald H. White and a comparison with the trumpet sonatas of Paul Hindemith and Kent Kennan' (University of Cincinnati: DMA, 1981) and Heinzen, C., 'Semiotic Modelling: Relevance to trumpet performance and musical interpretation using Paul Hindemith's Sonata for Trumpet and Piano' (Louisiana State University: DMA, 2006).

<sup>16</sup> Radoslavova, I., 'Paul Hindemith's "Craft of Musical Composition" and its application in his third piano sonata' (University of Wisconsin: DMA, 2006). This took the form of a lecture recital in a performance and research doctorate. Also see Thurston, V., 'Hindemith's Third Piano Sonata: a new assessment' (Ohio State University: DMA, 1984).

<sup>17</sup> Poeschl-Edrich, B., 'Modern and Tonal: An analytical study of Paul Hindemith's Sonata for Harp' (Boston University: DMA, 2005), Whang, D., 'Observations of Paul Hindemith's approach to form and tonal language: the three sonatas for viola and piano' (University of Hartford, 2005), Ohlsson, J., 'Paul Hindemith's Music for Flute: Analyses of solo works and stylistic and formal considerations of chamber work' (Ohio State University: DMA, 1975), Townsend, G., 'A Stylistic and Performance Analysis of the Clarinet Music of Paul Hindemith' (University of Illinois: Educat.D, 1967), Koper, R., 'A Stylistic and Performance Analysis of the Bassoon Music of Paul Hindemith' (University of Illinois: Educat.D, 1972), Walter, R., 'Paul Hindemith's "Sonata" for Trombone: a performance analysis' (Louisiana State University: DMA, 1996).

However, there are already two on Hindemith (2005 & 2009).<sup>18</sup> This further highlights the wealth of archival material available on Hindemith; and yet, no devoted monograph has been published on Hindemith in the English language since Neumeier. The quantity of archival material is disproportionately rich compared with the quantity of monographs.

## 1.4 Chapter Summary

The first challenge faced by Hindemith scholarship is the clarification of the identity of his music theory. Chapter two addresses this, and highlights that Hindemith believed his theory to create a ‘total tonality’, while also critically engaging with some of his theoretical inconsistencies. The third chapter develops an original method for the analysis of Hindemith’s music, based on set theory and voice leading, which is connected to the areas of *Unterweisung* theory that have the clearest relationship with free composition: quartal harmony and chromatic counterpoint. Chapters four to six comprise the main analytical data of this thesis, and investigate the three areas relating to Hindemith’s *Unterweisung* appendix: music before, after, and revisions. These demonstrate the evolving presence of theory-principles in his music, in addition to changes in Hindemith’s style that are not directly referred to in theory.

While chapter two partly investigates imperfections in Hindemith’s theory-writing, chapter seven shows that the expression of these problems in the English-language journal *The Music Review* carries an inappropriate level of venom. The level of criticism in this influential academic publication (one of the only to publish in depth on *Unterweisung*-theory in English) is caustic to the extent that one may point to external agendas from the authors. This further shows that an understanding of Hindemith’s ideological position is necessary for an accurate evaluation of his music theory: in other words, it is unfair to attack the *Unterweisung* without trying to firstly understand what Hindemith was trying to achieve. Chapter eight examines the legacy of

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<sup>18</sup> See Desbruslais, Simon, review of Stephen Luttman, ‘Paul Hindemith: a Research and Information Guide’, 2nd edn (New York: Routledge, 2009), *Twentieth-Century Music* Vol. 8, No. 2 (September 2011) pp 266-269.

Hindemith's work, with a particular focus on how the identity of his music theory, and Hindemith's relationship to his students, affected its dissemination. He was both unfortunate, leaving the United States at precisely the time when set theory and Schenkerian theory gained a foothold, and lacking in the delicacy and subtlety necessary to achieve the admiration from a large proportion of his students. It also shows subsequent theoretical and compositional fashions that are indebted to his work, notably music theory that blends music with natural science, accompanied by the aspiration to create a theory that is in some way applicable to all forms of Western Music.

This thesis therefore addresses the following three central questions: what is the identity of Hindemith's music theory, how does it relate to his music, and what legacy did it leave? Hindemith scholarship is ripe for such enquiry in 2013, fifty years since Hindemith's death, through the lens of unpublished archival sources. The connection between his music and theory deserves a re-evaluation.

## Chapter 2: A Critical Commentary on Hindemith's *Unterweisung*

### 2.1 Overview, Description and Identity

The first volume of Paul Hindemith's *Unterweisung im Tonsatz* is an original, speculative and generalising theory of music. It consists of six chapters which introduce and apply concepts of harmony, melody, and analytic method. The *Unterweisung* is based on two main premises: Series 1, which creates an order of melodic relationships, and Series 2, which creates an order of harmonic relationships. These are founded on the acoustic, and scientifically observable, phenomena of overtones and combination tones respectively. Series 1 and 2 are then used to develop a new understanding of harmony – including two-voice framework, chord value, harmonic fluctuation and degree-progression – and of melody – including step progression, chordal association and melody degree-progression. Both theories of harmony and melody prioritise the fourth and the fifth over other intervals.

Through his music theory, Hindemith hoped to rekindle interest in a synthetic approach to music and the natural sciences – particularly physics and astrology.<sup>19</sup> The aspiration that music theory and science would one day converge in a universal form reflects the polymath music theorists of old, from Pythagoras to Hermann von Helmholtz, who pioneered work across a range of disciplines. The introduction to *Unterweisung I* is abundant in language that implicitly links Hindemith's music theory to Johannes Kepler's *Harmonices Mundi* (1619), most notably the concept of 'harmonic gravitation'.<sup>20</sup> This relationship is made explicit in Hindemith's opera of

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<sup>19</sup> Hindemith, Paul, *A Composer's World: Horizons and Limitations* (Cambridge: Harvard University Press, 1952) p. 102. The final paragraph of chapter 5, on 'Means of Production' outlines in poetic detail Hindemith's hopes for the future of music theory: 'The time may perhaps return, when musical rules will be, as they were in olden times, an essential part of the code of the physical sciences. It is an alluring idea to think of a reorganization of scientific concepts on a musical basis. Instead of a plan for the world's destruction by superbombs, a blueprint of music theory would be drawn up to serve as a plan for a tremendous reformation of the universe. Harmonic, melodic, and rhythmic laws, as worked out in a most beautiful and exalted composition, would transform the world's woes and falsehood into the ideal habitat for human beings, who by the same process of musical ennoblement would have grown into creatures worthy of such a paradise.'

<sup>20</sup> The first reference to this concept occurs in *Craft* (1942) p. 22: 'In the world of tones, the triad corresponds to the force of gravity.' Hindemith also owned a copy of Kepler's *Welt-Harmonik* (Munich & Berlin, 1939), which contains a German translation of Kepler's *Harmonices Mundi* (1619).

the life of Kepler, *Die Harmonie der Welt*, and is the most speculative aspect of his treatise. Hindemith also believed that his music theory could be applied to music from all genres and eras, as demonstrated by the analysis of music from Gregorian Chant to Schoenberg and Stravinsky, although it is critical of serialism and polytonality. It is one of the most ambitious works of music theory ever written.

Volume one does not make Hindemith's music-theory objectives clear. It begins with a quotation from Johann Joseph Fux's *Gradus ad Parnassum* (1725): a wholly practical textbook, without speculative theory, which trains the student to imitate the contrapuntal style of Palestrina.<sup>21</sup> However, Hindemith confuses his objectives when he writes that 'the success of Fux's work shall be a good omen for mine', which parallels the *Unterweisung* with the *Gradus*.<sup>22</sup> *Unterweisung I* has a different status to both the speculative work of Kepler and Fux's species counterpoint. It is a peculiar and hazy blend of practical species counterpoint and speculative music theory, and the prescriptive and descriptive elements of theory and analysis.

Common ground between the *Unterweisung* and the *Gradus* include the pedagogic structure of the four *Unterweisung* volumes, both on a larger scale in the progression from each volume from two- to four-part counterpoint, and on a smaller scale within each volume, whereby the student begins with a restrictive set of rules, which are gradually relaxed. However, Hindemith's failure to complete the publication of the third and fourth parts has left this pedagogic structure incomplete; the final product, a work of free composition, is never reached. Hindemith's concept of 'two-voice framework' is the closest to species counterpoint. It concerns a contrapuntal reduction, whereby only the outer two parts are shown. These parts may then be analysed for voice leading progressions.

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<sup>21</sup> Fux is one of only three theorists referenced by Hindemith in the *Unterweisung*. Riemann and Prout are the others, mentioned in passing.

<sup>22</sup> *Craft* (1942) p. 11.

Three texts written by Hindemith after *Unterweisung I* provide clearer insights into his music-theory objectives: an article, ‘Methods of Music Theory’ in *The Musical Quarterly* (1944); the monograph *A Composer’s World* (1952); and a talk entitled *Sterbende Gewässer* (1963).<sup>23</sup> The first of these sums up his objectives:

Music theory investigates, arranges, and explains the working material of the composer. The ideal goal of this investigation, arrangement, and explanation is to comprehend once and for all the whole domain of tone in all directions and relationships, so that every conceivable sort of music can be explained, so far as its technical nature is concerned, whether it be a composition that comes down to us from the remotest ages or the work of a composer of the future.<sup>24</sup>

This shows how Hindemith hoped for a generalising theory of music – one which may be applied to every possible type of composition. He contextualises his ‘physical’ approach to music theory, in other words, one which is based in part upon scientifically observable phenomena, against the work of Jean-Philippe Rameau (the justification of the diatonic system in acoustics) and Giuseppe Tartini (one of the first to publish on combination tones).<sup>25</sup>

Hindemith’s failure to complete the *Unterweisung* four-volume set led him to revise these goals in *A Composer’s World*, which is the published form of his Harvard Charles Eliot Norton lecture series. Compiled nearly twenty years after Hindemith began to formulate the *Unterweisung*, it afforded him an historical perspective on his own theory and offers reasons why the *Unterweisung* is needed. Moreover, Neumeyer (1986) has suggested that it is a more accurate representation of his theory as expressed in *Unterweisung III*.<sup>26</sup> A recurring theme is his reference to ‘Musica est scientia bene modulandi’ from Boethius’ *De Institutione Musica* (early sixth century) which dictates the importance of a scientific approach to music. This does not refer to the initial moment of artistic inspiration, which Hindemith likens to a bolt of lightning brightening a landscape, but to

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<sup>23</sup> *Sterbende Gewässer* was delivered on 28 June, 1963 in Bonn. It has since been translated by one of Hindemith’s students as ‘Polluted Waters’. This translation is unpublished, and is held in the Yale Hindemith Collection.

<sup>24</sup> Hindemith, Paul, trans. Mendel, Arthur, ‘Methods of Music Theory’ *The Musical Quarterly* Vol. 30, No. 1 (Jan., 1944) pp. 20-28.

<sup>25</sup> *Ibid.*, p. 23. Overtones form the basis of Rameau, Jean-Philippe, *Traité de l’harmonie* (Paris, 1722). Combination tones were first observed by the German organist Georg Andreas Sorge in his *Anweisung zur Stimmung der Orgelwerke und des Claviers* (Hamburg, 1744). This was succeeded by Giuseppe Tartini in his *Trattato di Musica* (Padua, 1754), who used combination tones as a method for tuning the violin.

<sup>26</sup> Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) p. 22. Hindemith’s work on *Unterweisung III* was still ongoing at this time.

the technical realisation of this vision.<sup>27</sup> It is implied during this discussion that Hindemith's theory teaching, based on the *Unterweisung*, offers a way of refining musical technique to achieve this outward expression of the internal artistic creations of a composer.<sup>28</sup> This view is neatly summarised in an analogy to the sciences where Hindemith writes that a colleague once said, 'Everybody can have – and has – scientific ideas, but it takes a scientist to know what to do with them'.<sup>29</sup> The first part of *De Institutione Musica* relates to 'Musica Mundana' (music of the spheres), and therefore to Hindemith's fascination with Kepler.

Both 'Methods of Music Theory' and *A Composer's World* historicise Hindemith's theoretical position. Perhaps this is necessitated by Hindemith's lack of theoretical context in the earlier *Unterweisung*, which, while based heavily on work such as Oettingen, Helmholtz, Pythagoras and Kepler, does not reference them. Instead, Hindemith chooses to express his aims as a twentieth-century development of Fux, rather than a new, acoustic derivation of pitch hierarchy.

Further perspective on Hindemith's music theory is provided by his final text, *Sterbende Gewässer* (Polluted Waters). This was delivered as a talk less than five months before his death, and therefore represents his final thoughts on music theory. It is notable for showing that, while Hindemith may have planned to revise the entire *Unterweisung* set, he did not intend to reject the basis of his theory in overtones and combination tones. He describes his theoretical objectives as the creation of a 'total tonality', which contains not only the major and minor scales, but all compositional possibilities.

Hindemith's chapter order lacks a logical progression, which is as follows:

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<sup>27</sup> *A Composer's World: Horizons and Limitations* (Cambridge: Harvard University Press, 1952) p. 60 and 67. He also uses the metaphor of turning a negative photographic image into a colourful positive on p. 220.

<sup>28</sup> *Ibid.*, p. 59.

<sup>29</sup> *Ibid.*, p. 58.

1. Introductory
2. The Medium
3. The Nature of the Building Stones
4. Harmony
5. Melody
6. Analyses

Series 1 and 2 are introduced in chapter three. They concern melody and harmony respectively. The following two chapters run the opposite order: harmony and then melody, which confuses the practical application of Series 1 and 2. Hindemith also uses his concept of two-voice framework to describe harmony in chapter four, even though this is primarily a contrapuntal technique. There is a further lack of distinction between the concepts of harmonic degree progression, and melodic degree progression. The final and most disruptive layout in this volume is the presence of a short section entitled ‘practical application’: before the melody section has been introduced.

## 2.2 Chronology and Translation into English

Hindemith engaged with the challenges of music theory after accepting a chair in composition at the Berlin Hochschule für Musik in 1927, which carried the need to deliver a coherent curriculum in musical training. The decision to publish this didactic work may be traced to a commission in 1933 by Josef Müller-Blattau, who approached Hindemith to write a series of handbooks.<sup>30</sup> Neumeyer (1986) details the eight chapters found in the handbooks Hindemith was to call *Komposition und Kompositionslehre*.<sup>31</sup> Handbook chapters one and eight, on ‘invention and form’, may be compared to the *Unterweisung* chapter on analysis (although invention receives scant treatment). The second handbook chapter on ‘the music of the last decades’ may also relate

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<sup>30</sup> Hindemith was commissioned by Josef Müller-Blattau in 1933 to write a music handbook under the title of ‘Die Lehre der Erfindung und Gestaltung in der Instrumentalmusik’, although Hindemith’s manuscript title simply read ‘Komposition und Kompositionslehre’. Three drafts of this appeared, although the publisher initially withdrew the project for political reasons. Discussed in Neumeyer (1986) pp. 24-5 and Hinton, Stephen, *The Idea of Gebrauchsmusik: a study of musical aesthetics in the Weimar Republic (1919 – 1933) with particular reference to the works of Paul Hindemith* (New York: Garland, 1989) pp. 215.

<sup>31</sup> Neumeyer (1986) p. 25, referenced from Rubeli, Alfred, *Hindemiths A Cappella Werke* (Mainz: Schott, 1975) p. 75.

to his *Unterweisung* criticism of atonality and polytonality. The third chapter resonates with the didactic element of *Unterweisung*, while ‘harmony and counterpoint’ precludes Series 1 and 2.

1. Invention and form
2. The music of the last decades
3. Teacher and student
4. Harmony and Counterpoint
5. Curriculum I
6. Curriculum II
7. Curriculum III
8. Again, invention and form

These handbooks were never published. This may be credited to ‘Der Fall Hindemith’ by 1935 due to friction with the National Socialists, resulting in the publisher, Athenaion, withholding it from publication.<sup>32</sup> This was precipitated by Hindemith’s ‘incautious’ words, which he was alleged to have spoken in Switzerland in the summer of 1934, and which led to a probationary ban on radio broadcasts of his music. Hindemith’s music theory was therefore inextricably linked to the wider political environment.

The progression from a series of handbooks to the *Unterweisung* took place between 1933 and 1935. Four drafts were compiled between 1935 and 1937, of which the fourth became the first published edition. The unpublished drafts are analysed by Schubert (1980), showing that the speculative component, particularly in relation to Kepler, only appeared in the second and third versions.<sup>33</sup> These are interpreted as ‘an attempt on Hindemith’s part to find a new justification for composing after experiencing increasing isolation under National Socialist rule.’<sup>34</sup>

In addition to the four drafts of the *Unterweisung* from 1935-7, further revision took place to form the 1940 edition.<sup>35</sup> It is by coincidence that the English translation of 1942 by Arthur Mendel

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<sup>32</sup> Hinton, Stephen, *The Idea of Gebrauchsmusik: a study of musical aesthetics in the Weimar Republic (1919 – 1933) with particular reference to the works of Paul Hindemith* (New York: Garland, 1989) p. 215, Neumeier (1986) p. 24.

<sup>33</sup> Schubert, ‘Vorgeschichte und Entstehung der “Unterweisung im Tonsatz: Theoretischer Teil” *HJb* 9 Vol. 9 (1980) pp. 16-64.

<sup>34</sup> Hinton, Stephen, *The Idea of Gebrauchsmusik: a study of musical aesthetics in the Weimar Republic (1919 – 1933) with particular reference to the works of Paul Hindemith* (New York: Garland, 1989) p. 223.

<sup>35</sup> While Giselher Schubert discusses the genesis of the *Unterweisung* up until the completed edition of 1937, with a particular emphasis on the unpublished drafts preceding this, there are no thorough studies that tackle the

was of the revised, 1940 edition; the 1937 text was originally planned to be translated by Remi Gassmann with a foreword by Donald Francis Tovey. However, Gassmann was not able to prioritise the task, as is evidenced by Hindemith's letter to Ernest Voigt on 8 November 1939:

I have heard nothing more from Gassmann, you presumably also not. Perhaps he is using the war confusions as a further excuse for putting [the translation of the *Unterweisung*] off. I feel we shouldn't waste much more time on him [...] If the second volume appears in English, that will be quite sufficient for all practical purposes. The purely practical work is not dependant on the theories set out in the first volume, and thus the theoretical part can safely be left for publication later, with a more trustworthy translator working on it.<sup>36</sup>

Gassmann's failure to translate the *Unterweisung* on schedule both robbed Hindemith of a foreword by Tovey – which would undoubtedly have been hagiographic given his respect for Hindemith – and a translation of the 1937 volume of the *Unterweisung*.<sup>37</sup> This is a double misfortune, as the advocacy of Tovey would have helped Hindemith's cause to the English-speaking public (the 1942 Mendel translation has no foreword at all). Moreover, Hindemith's tone in the 1937 edition is considerably less speculative.

Luther Noss has written the following *Unterweisung* chronology, held in the Yale Hindemith Collection, which corroborates the unfortunate events surrounding the English translation:

- 1935: Began writing in December.
- 1936: Finished a first draft in February but decided to rewrite the entire book. Gertrud Hindemith said it was in order to make it more “comprehensible and practical”. Completed the revision by November (all but the “Analyses” chapter, with examples). Arrangements for having an English translation were already being made and a certain Herr Gassmann was engaged.
- 1937: Further revisions were made during February and January. The manuscript was sent to Schott in Mainz before he embarked for New York on March 25 to make his first concert tour of the United States. Completed the “Analyses” chapter during the voyage over and the first few days in New York. Sent this material to Schott on April 7. The German edition was published by Schott in June. PH still expected an English translation to be out by “Christmas”.
- 1938: Began work on a second revised German edition in September. Still thought an English translation would soon be ready.
- 1939: Gassmann now promised to have the translation ready by May 15.
- 1940: The English translation was still not done as of July, but PH thought it better to wait until the English translation of *Craft II* was published.

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implications of these alterations. See Giselher Schubert, ‘Vorgeschichte und Entstehung der *Unterweisung* im Tonsatz – Theoretischer Teil’ *HJb* Vol 9 (1982) pp. 16-64.

<sup>36</sup> Skelton, Geoffrey, *Selected Letters of Paul Hindemith* (New Haven: Yale University Press, 1995) p. 139. This quotation surprisingly contradicts with the presence of Series 1 and 2 in *Craft II* (1939), pp. 89-94. However, Hindemith dispenses with a Kepler analogy for Series 1 and 2, favouring instead a metaphor of family generations. For example, the root of an interval is a ‘father’ and the other pitch is his ‘child’, rather than harmonic ‘gravitation’.

<sup>37</sup> *Ibid.*, p. 142: ‘In July 1937 Donald Tovey wrote to Miss Weisse, his former teacher: “The great event in musical history at this moment is the appearance of Hindemith’s harmony book”.’

Gassmann was finally “fired” as a translator and Arthur Mendel was asked to do it. [Mendel had been called in to help with the translation of Craft II; the AMP officials liked what he did and thus asked him to do Craft I].<sup>38</sup>

There is a semantic difference between the titles *Unterweisung im Tonsatz* and *The Craft of Musical Composition*. Firstly, the term *Unterweisung* (literally, ‘instruction’) implies a much more pedagogical slant than Mendel’s translation suggests. Secondly, the term *Tonsatz* referred, at the time, to what is now considered in the Anglo-American university education system as the ‘techniques of composition’ or ‘harmony and counterpoint’.<sup>39</sup> The German edition therefore refers, in title at least, not to free composition but to techniques of composition. A more literal translation of *Unterweisung im Tonsatz* is therefore ‘Instruction in Harmony and Counterpoint’. This allies it more closely with Fux.

The first English version of Hindemith’s work to appear in publication was the second volume of the *Unterweisung*, translated by Otto Ortmann. Arthur Mendel (Gassmann’s replacement) was asked to proof this translation, evidenced by several unpublished letters from 1941, and was shocked to find Ortmann’s suggested translation of the title as ‘The Craft of Tone-Setting’.<sup>40</sup> He was also worried that his own translation, which was to be published in 1942, would have to carry the same title. Mendel was satisfied with ‘Craft’, although suggested the two figurative translations: ‘The Composer’s Craft’ or ‘The Craft of the Composer’. In a subsequent letter, Mendel writes that the American musicologist, Carl Engel, was consulted over the translation, who offered ‘The Craft of the Composer and his Tools’.<sup>41</sup> In the 1940 supplementary volume of Grove’s Dictionary, prior to the English translation, Marion M. Scott translates the title as ‘Groundwork of Musical Composition’ while John Halliday refers to it as ‘Instruction in

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<sup>38</sup> Unpublished chronology of the *Unterweisung* held in the Yale Hindemith Collection. It is likely to have been written by Luther Noss.

<sup>39</sup> For further information on the term ‘Tonsatz’ at the beginning of the twentieth century, see Holtmeier, Ludwig, ‘From “Musiktheorie” to “Tonsatz”’: National Socialism and German Music Theory after 1945’ *Music Analysis* Vol. 23, No. 2 (July, 2004) pp. 245-266.

<sup>40</sup> MSS 81: Thomas Hall Collection Box 1: 1941 Correspondence between Arthur Mendel (1905-1979) and Paul Hindemith (1895-1963). Mendel expresses his dislike for ‘The Craft of Tone-Setting’ in a memorandum to Voigt and Hindemith to accompany his letter of 2 February 1941.

<sup>41</sup> Thomas Hall Collection, Box 1: 1941 Correspondence. Letter dated 24 March 1941.

Composition’ in his thesis.<sup>42</sup> Mendel had also toyed with replacing ‘Tools’ with ‘Medium’ or ‘Materials’ before arriving at the final title.<sup>43</sup> This long labour of the translation of the title is due not only to the problematic German word, *Tonsatz*, but also to Mendel’s view that the title should be simple and self-explanatory: ‘Once people are inside the book they will be willing to read explanations and take them into account. But what is on the cover should need no explanation.’<sup>44</sup> While Mendel’s suggestions were incorporated into the final English title, Ortman’s translation as ‘Tone-Setting’ is closer to Hindemith’s original meaning of ‘*Tonsatz*’.

Hindemith practised elements of *Unterweisung* theory in both his Berlin and Yale classes. This seems to conflict with the subheading of ‘theoretical part’, although Hindemith’s letter to Willy Strecker (his publisher at Schott & Co.) on 11 November 1934 states that ‘the plan for the first chapter is already drawn up, and it has been thoroughly tried out in practice’.<sup>45</sup> As the practical element of volume one is unclear, it is plausible that Hindemith was referring to the demonstration of overtones and combination tones as a basis for Series 1 and 2. This is also evident in the ‘Advanced Theory of Music’ modules at Yale during the 1940s. These courses were the first teaching units given by Hindemith, and were split into two groups. The first consisted of a study of the principles of the *Unterweisung*, whereas the second progressed to free composition – although the nature of this progression is unclear.<sup>46</sup> The class notes of Miriam Fox Withrow from 1947-8, shown in example 2.1, provide evidence of Hindemith’s teaching in acoustics, and yet without demonstrating an explicitly practical outcome (the voice-leading between two chords in four parts, at the end of the second page, is a copy of Hindemith’s

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<sup>42</sup> Halliday, John, ‘Paul Hindemith – the Theorist’ (University of Rochester, Eastman School of Music, PhD, 1941), which was kindly made available by the Eastman School of Music Library, and Thomson, William, ‘A Clarification of the Tonality Concept’ (University of Indiana, PhD, 1952), p. viii.

<sup>43</sup> Thomas Hall Collection, Box 1: 1941 Correspondence. Letter dated 24 March 1941. Mendel suggests the following: ‘The Composer’s Materials, The Craft of the Composer and his Materials, The Tonal Material(s) of the Composer’. This letter also shows that Mendel was responsible for the addition of the footnote concerning the translation of *Satz* at the bottom of *Craft II*, p. vii.

<sup>44</sup> *Ibid.*

<sup>45</sup> Skelton Geoffrey., *Selected Letters of Paul Hindemith* (New Haven: Yale University Press, 1995) p. 83.

<sup>46</sup> Noss, Luther, *Paul Hindemith in the United States* (Urbana: University of Illinois Press, 1989) p. 94.

discussion of the tritone in Series 2, found in *Craft I* p. 82 – it does not relate to a practical procedure of voice-leading). Another later entry in her notes also shows that Hindemith still directed his students towards Fux's *Gradus*.

Maj. 3<sup>rd</sup> 4<sup>th</sup> 5<sup>th</sup> C.T. 1

Min. 6<sup>th</sup> 5<sup>th</sup> 4<sup>th</sup> C.T. 2

Min. 3<sup>rd</sup> 5<sup>th</sup> 4<sup>th</sup> C.T. 1

Maj. 6<sup>th</sup> 3<sup>rd</sup> 2<sup>nd</sup> C.T. 2

Triads

Innumerable possibilities between

Chords are produced by "A" Intervals. What looks like an inversion is really a chord built on "A" Intervals.

arrow indicates root

Difference in Quality of:

Major Triad

Minor Triad

Sum of Intervals C.T.

Example 2.1: class notes 1947-8 of Miriam Fox Withrow from 'Basic Principles of Theory'.

Combination Lines

Dots are combination lines of 2<sup>nd</sup> order  
See Diagram 37

Series of Values of Intervals See Chart 59

Chart of Harmonic values ← Scale with aesthetic implications

no harmonic value   ← A. intervals →   ← B. intervals →   Intone

Chart of melodic values

Intone

Lowest Intone possible, close to a 4:3.

Highest Intone possible, close to a 5:3.

over.

Example 2.1 (continued): class notes 1947-8 of Miriam Fox Withrow from 'Basic Principles of Theory'.

These notes show Hindemith's teaching in combination tones as the basis for Series 2, including the concept of roots and harmonic and melodic 'value'. However, despite the relationship between the *Unterweisung* and Hindemith's Yale classes some ten years later, Noss writes that:

students in Hindemith's "Basic Principles of Theory" course ... were surprised to learn that he had been having second thoughts about some of the ideas he had proposed [in the *Craft*] and was beginning to make certain modifications.<sup>47</sup>

This is also felt by another of Hindemith's Yale colleagues, Howard Boatwright, who draws attention to the evolution of Hindemith's theory throughout his life:

<sup>47</sup> Noss, Luther, *Paul Hindemith in the United States* (Urbana: University of Illinois Press, 1989) p. 99.

Perhaps [The *Craft I* was] written a little too soon because Hindemith sees the picture more clearly now and in the remaining volumes will contradict many things in the first volume. The final estimate of this work will have to depend on the last book, and he is not through.<sup>48</sup>

In his 1972 review of the posthumous release of *Craft III*, Charles Shackford writes that he had first-hand experience of Hindemith's teaching as one of his composition students.<sup>49</sup> He states that as early as 1943 Hindemith was using material from *Craft III* in the classroom. However, Shackford also emphasises the incomplete nature of the 1970 posthumous publication. This, combined with statements by Noss and Boatwright, problematises the status of *Craft III*. While its study is of considerable importance as a record of Hindemith's subsequent musical-theoretical ideas, Hindemith never pursued publishing the text in his own lifetime. An entry in his pocket diary on 14 July 1949 states that 'chapter 20 of *Part III* is finished'.<sup>50</sup> This would mean the completion of the volume; however, Noss believed that Hindemith was never completely satisfied with it.<sup>51</sup> Hindemith delayed publication, apparently waiting for time in his schedule to reorganise (and perhaps rewrite) the whole series, to which he referred to as his 'treatise' in the conclusion of *Craft II*.<sup>52</sup> It is also not clear, in *A Composer's World* (1952), whether the following statement refers to this process of revision, or to a new volume in four-part writing: 'I am preparing an elaborate textbook on the technique of composition, based on the theories presented in this book.'<sup>53</sup>

In a letter from Joseph Dunlap to Noss dated 7 October 1973, he confirms both that Hindemith practiced *Unterweisung* principles in the classroom, and that he intended to revise the set:

Here are two chapters from P.H.'s book on three-part writing, ca 1946-7 – the only ones I have. I believe that he wrote them in English, had someone type them, and then sent them to Arthur Mendel, whose notes are in the margins. The notes in red are Hindemith's.

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<sup>48</sup> Boatwright, Howard, *Hindemith's "Series": a critical evaluation and a new formulation* (unpublished, 1959) main book text p. 1.

<sup>49</sup> Shackford, Charles, review of 'Übungsbuch für den Dreistimmigen Satz' *Journal of Music Theory* Vol. 16, No. 1-2 (Spring – Winter, 1972) pp. 238-265.

<sup>50</sup> Noss, Luther, *Paul Hindemith in the United States* (Urbana: University of Illinois Press, 1989) p. 133.

<sup>51</sup> *Ibid.*, p. 133.

<sup>52</sup> *Craft II* (1939) p. 160

<sup>53</sup> Hindemith, *A Composer's World* (Cambridge: Harvard University Press, 1952) p. vi.

Eventually the corrected and annotated copies were given to me. I typed and dittoed them for our theory class. XII through XVI are enclosed.

Hindemith was giving us work in three-part writing in 1942, but was having problems, I think. Following World War II, he changed his approach.<sup>54</sup>

### 2.3 The Rundfunkversuchsstelle

Hindemith's position at the Berlin Hochschule für Musik (1927-37) coincided with a period of interest and experimentation in acoustics and instrumental development. This took place in the experimental broadcasting institute (Rundfunkversuchsstelle), located within the Hochschule building. It published findings within the annual college publication (Staatliche Akad. Hochschule für Musik in Berlin Jahresbericht). The institute was located in close proximity to Hindemith's office, and provided him with a rare resource with which to investigate acoustic phenomena. Closed down in 1934 by Fritz Stein, the director of the Hochschule who was appointed by the Nazis in 1933, it is likely that the broadcasting resources of the Rundfunkversuchsstelle were diverted to the assistance of Third Reich propaganda.

This research culture influenced Hindemith's approach to the building of music theory. He constructed a monochord, which is described in chapter two of the *Unterweisung* ("The Medium"), and which is used to formulate Series 1. He also came into contact with combination tones, via two different scenarios, which are used as the basis of Series 2. The first relates to a combination tone demonstration at the Musikhochschule using flute and oboe, on 2 March 1929.<sup>55</sup> It is possible that Hindemith may have been present. The second concerns Friedrich Trautwein, who was appointed to the Rundfunkversuchsstelle in 1930, and who developed several original instruments, including an amplified harpsichord, electronic bells and the Trautonium. Hindemith wrote several compositions for the latter, including a *Konzertstück* (1931). This instrument

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<sup>54</sup> Unpublished letter from Joseph Dunlap to Luther Noss dated 7 October 1973.

<sup>55</sup> Folder 11, record 6 of the Rundfunkversuchsstelle archive held in the Berlin University of the Arts includes the following information: 'Am 2. März 1929 bestätigte mir Herr Borris, daß auch seine Versuche beim Zusammenspiel von Oboe und Flöte Kombinationstöne ergaben, wie ich das auf Grund von 1923 in der Gesellschaft für technische Physik gezeigten Demonstrationen in der Vorlesung erwähnt hatte. Bei Wiedergabe durch einen Lautsprecher waren die Kombinationstöne nach Borris besonders stark.'

would have been ideal for demonstrating acoustic phenomena. Moreover, one of Hindemith's students, Oskar Sala, was a proficient performer of the Trautonium, and he, alongside Friedrich Trautwein, is thanked for his contribution at the beginning to the 1937 edition of the *Unterweisung*.

Further evidence for Hindemith's experimentation with combination tones may be found in a proposal dated 23 September 1964 by George Lam for a Hindemith commemoration event at Yale. He writes of a combination tone record kept by Hindemith:

Hindemith had made a record of combination tones while at the Berlin Hochschule. This record, made probably before 1934, though acoustically poor, was used by Hindemith in his classes to illustrate the foundation of his theory. He was very proud of this record.<sup>56</sup>

This combination tone record is also referred to in a letter from Arthur Mendel, dated 22 July 1942. Regrettably, following discussions with member of staff at the Yale Hindemith Collection, it appears that this record is lost.

## 2.4 Series 1

The *Unterweisung* defines what Hindemith referred to in 1963 as a 'total tonality'.<sup>57</sup> It encompasses not only the major and minor diatonic systems, but all possibilities of the chromatic scale within a hierarchy: an ordered chromatic pitch space. The first volume formulates a theory of melody (Series 1) and harmony (Series 2), and it begins with empirical, acoustic observations and yet reaches speculative conclusions. Series 1 is described as 'gravitational' in a selection of Hindemith's writings, including *A Composer's World*, which bears an explicit relationship to the theories of Kepler and Hindemith's opera, *Die Harmonie der Welt* (1957).<sup>58</sup>

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<sup>56</sup> Unpublished letter from George Lam to Yale dated 23 September 1964.

<sup>57</sup> Hindemith, *Sterbende Gewässer* (1963).

<sup>58</sup> Hindemith also perceives tonality in terms of gravitational relationships: see *A Composer's World: Horizons and Limitations* (Cambridge: Harvard University Press, 1952) p. 55.

Hindemith's Series 1 is an order of pitches. Each successive pitch in the order has a diminished relationship to the initial, 'progenitor' tone.<sup>59</sup> The order of pitches (ex. 2.2) contains all notes of the chromatic scale, beginning with C and ending in F#. Therefore, F# is considered the furthest note away from C in the hierarchy. It has a primarily linear function, which can operate on both macro and micro levels, from advising the pitch relationships within a single melody to governing the melodic layout of complete musical works. The use of Series 1 is varied: it governs the starting pitches to each fugue in Hindemith's *Ludus Tonalis* and organises distant pitch relationships in *Mathis der Maler* and *Das Marienleben*.



Example 2.2: Hindemith's Series 1

This order is based on the overtone series (which Hindemith would demonstrate in the classroom using a monochord), and emphasises the prominence of the fourth and fifth in melody writing. Hindemith derives each pitch by adapting the order of harmonic partials from a fundamental note of C at 64Hz, which generates the frequencies shown in table 2.1. Hindemith did not strictly follow the overtone series itself – which eventually contains every note of the modern chromatic scale – because it falls outside the limits of an octave. His solution proceeds by examining each partial and dividing it by an integer. The second note in his order takes the third partial and divides it by two while the third note takes the fourth partial and divides it by three. Hindemith states this as the following rule:

To arrive at each new tone of the scale, divide the vibration-number of each overtone successively by the order-numbers of the preceding tones in the series.<sup>60</sup>

Expressed algebraically, the rule suggests that:

$$f^x = \frac{f^1(x+1)}{x}$$

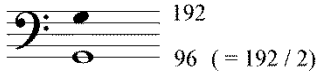
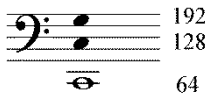
Where  $x$  is the order number in the series and  $f$  is the frequency.

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<sup>59</sup> The word 'progenitor' is common in the *Craft*, and is typical of Hindemith's metaphor of the family when outlining his tonal relationships.

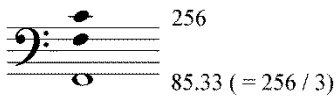
<sup>60</sup> *Craft* (1942) p. 34.

The second pitch in Series 1 is derived by dividing the third partial of 64Hz (192Hz) by two:



Example 2.3: the derivation of pitch 2 from Series 1, based on the diagrams found in the *Craft*, p. 34.

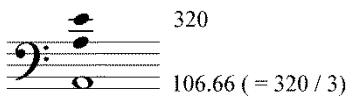
The third partial cannot then be divided by another integer and remain within an octave, so Hindemith proceeds to the fourth. This time, he divides it by three in order to find a frequency within the octave:



Example 2.4: the derivation of pitch 3 from Series 1, based on the diagrams found in the *Craft*, p. 34.

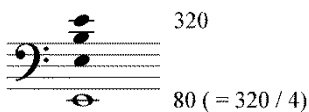
What is not clear in Hindemith's text, particularly to begin with, is that this rule will only work for four pitches in his series (excluding the generating pitch, and including G, F, D and B<sub>♭</sub>). It is also no coincidence that for each of these pitches the frequency corresponds exactly with Pythagorean temperament.

The fourth pitch in Series 1 is derived by dividing the fifth partial by three (not four):



Example 2.5: the derivation of pitch 4 from Series 1, based on the diagrams found in the *Craft*, p. 35.

And the fifth by dividing the fifth partial by four (not five):



Example 2.6: the derivation of pitch 4 from Series 1, based on the diagrams found in the *Craft*, p. 35.

Hindemith finds that the awkward ratios produced by dividing the seventh partial (448Hz) prevent him from using partials above the sixth. It may be divided by three different integers to create pitches within the span of an octave:

$$\begin{array}{l} 448 / 4 = \quad 112 \quad (\text{B}\flat) \\ 448 / 5 = \quad 89.6 \quad (\text{G}\flat) \\ 448 / 6 = \quad 74.66 \quad (\text{E}\flat) \end{array}$$

In all three calculations, the results yield temperaments that are more suitably found elsewhere: the first option derives a B $\flat$  that is too close to the A one semitone below and Hindemith prefers to divide the fourth partial of F by three to derive a B $\flat$  of 113.78Hz. The second option derives a G $\flat$ , which is too close to F, and the third derives an E $\flat$ , which is too close to D.

Problematically, Hindemith then breaks his formula, by using a new fundamental. This creates unnecessary confusion; these should be understood as higher partials of C, which include all pitches past the order-number 7 (A $\flat$ ). It is unfortunately impossible to derive further pitches from this formula that resemble any standard pitches.

Hindemith's method is therefore inconsistent, and it cannot be expressed with a single, generating formula. It is not arithmetically concise enough to have conformed to achievements in the natural sciences, which are so often the benchmark for theoretical success in the arts. Had Hindemith used one formula throughout it may have warranted more scientific credibility – an issue with which William Thomson (1952) finds fault in his doctoral dissertation. Thomson provides a version of Series 1 had Hindemith continued systematically, where, after the E $\flat$ , he offers: B $\flat$ , G $\flat$ , A $\flat$ , D, D $\flat$ , B $\sharp$ .<sup>61</sup> He finds that the moment arbitrariness enters Hindemith's judgements, all credibility is lost; concluding that anyone else could essentially invent a completely different scale that would be valid on the same grounds: 'If arbitrariness is admitted as one of the criteria, any individual can establish a set of interval values and a plan for scale

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<sup>61</sup> Thomson, William, 'A Clarification of the Tonality Concept' (University of Indiana, PhD, 1952) p. 58.

tuning to fit his own requirements'.<sup>62</sup> Table 2.2 (on page 36) simplifies Hindemith's calculations as formulae. This demonstrates that, in several cases, there were easier ways to derive certain pitches than Hindemith realised – some of which are in keeping with his first method of deriving pitches. His derivation of D includes the following calculations:

- |                               |                         |                  |
|-------------------------------|-------------------------|------------------|
| 1. Deduce G:                  | $3/2 * C (64\text{Hz})$ | $= 96\text{Hz}$  |
| 2. Deduce third partial of G: | $3 * 96$                | $= 288\text{Hz}$ |
| 3. Deduce D:                  | $288/4$                 | $= 72\text{Hz}$  |

This unnecessarily long process, which Hindemith justifies because 'the generating power of the parent tone, C, is exhausted', uses the second pitch of his Series (G) to find partials that can be divided to find new pitches.<sup>63</sup> However, had Hindemith expressed his work algebraically he would have found that his process can be simplified thus:

$$\frac{3\left(\frac{3}{2}\right)}{4} f^1 = \frac{9}{8} f^1$$

This shows that it is possible to derive the same frequency (D=72Hz) using the original fundamental (C=64Hz). Acknowledging and integrating this approach would have made Series 1 theory more systematic and easier to follow. The disadvantage on Hindemith's terms, though, is that it divides the ninth partial of C, which is above Hindemith's mystical number seven. Therefore, without Hindemith realising, he contradicts himself when he writes that 'the overtones lying above the seventh cannot be used for the derivation of further scale tones, any more than the seventh one itself' as the use of subsequent partials can be algebraically related back to the initial pitch; each further partial is simply a multiple of the 'parent' frequency.<sup>64</sup> Moreover, it is confusing that he proceeds to briefly acknowledge that it is possible to use the

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<sup>62</sup> Ibid., p. 59. He also states that, 'On the basis of evidence just presented, there is no reason to regard the method of scale construction of interval classification offered by Hindemith as more effective or "necessary" than another. It might well be true that the scale which he constructs by this manner or deduction would produce a more desirable aesthetic effect when used as the basis of tuning in actual musical practice. However, the aesthetic value of such a structure should in no way be considered as ample justification for the manner in which it is purportedly derived from man's knowledge of natural relationships.'

<sup>63</sup> *Craft* (1942) p. 39.

<sup>64</sup> Ibid., p. 39.

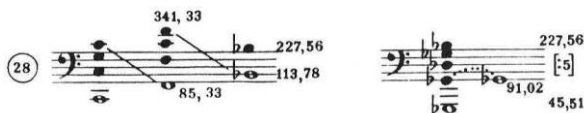
ninth partial to derive this D, although for some reason he chooses not to pursue the possibility further, or to engage with the problem that it creates with his chosen barrier of the seventh partial. Series 1 does not integrate the mystic number seven as much as Hindemith thought.

Hindemith derives the Series 1 B $\flat$  and G $\flat$  differently between the 1940 *Unterweisung* editions and 1942 *Craft* translation. This was caused by correspondences with Mendel, during the editing process, who found problems with Hindemith's frequency derivation. This particularly concerned the B $\flat$ , as demonstrated in an unpublished letter dated 2 November 1941.<sup>65</sup> Hindemith originally derives this as 115.2Hz (576/5): however, he discounts this frequency as he finds that it produces a result that is too far from the lower A of 106.66Hz (320/3). He offers a derivation that produces a B $\flat$  as 113.77Hz (1024/9). Mendel was not bothered that Hindemith had the first B $\flat$  (115.2Hz), but by the fact that Hindemith then used this discarded frequency to derive his G $\flat$ . Unfortunately, Mendel's alternative suggestion is also wrong, for he fails to calculate the recurring decimals. Hindemith replied, to which Mendel argued on the 22 December 1941 that it was still incorrect. It appears that Mendel's petition was eventually successful, as the following alterations suggest:

*Unterweisung* (1940) p. 59



*Craft* (1942) p. 41



Example 2.7: comparison of Series 1 derivations.

Other alterations made between the 1940 revised edition of the *Unterweisung* and Mendel's 1942 *Craft* translation include the list of 'equal temperament' frequencies given at the bottom of

<sup>65</sup> Letter contained in the Thomas Hall Collection, Box 1: 1941 Correspondence.

Hindemith's diagram entitled 'Derivation of the Tones from C'.<sup>66</sup> It is unclear to which temperament Hindemith's frequencies refer to in the 1940 *Unterweisung*: they are not equally tempered. These pitches are altered in Mendel's 1942 translation, although they still do not resemble the correct form of equal temperament, which is given below in Table 2.1. The correct form, whereby the ratio between each semitone is  $\sqrt[12]{2}$ , was finally offered by Mendel in a letter dated 24 June 1942 using logarithms and based on Riemann's *Tonbestimmung* (1857), which was later incorporated into the revised *Craft* of 1945.<sup>67</sup>

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<sup>66</sup> This table is a removable sheet from the *Unterweisung* (1940), whereas it may be found in between pages 56 and 57 in the *Craft* (1942).

<sup>67</sup> Letter contained in the Thomas Hall Collection, Box 1: 1942 Correspondence.

Number	Tone	Operation	Frequency (Hz)	Equal Temperament (Hz)	Pythagorean Temperament (Hz)
1	C	Starting tone	64†	64	64 (1:1)
2	G	Third partial (G: 192Hz) divided by two	96	95.89	96 (3:2)
3	F	Fourth partial (C: 256Hz) divided by three	85.33	85.43	85.33 (4:3)
4	A	Fifth partial (E: 320Hz) divided by three	106.66	107.63	108 (27:16)
5	E	Fifth partial (E: 320Hz) divided by four	80	80.63	81 (81:64)
6	E <sub>b</sub>	Sixth partial (G: 384Hz) divided by five	76.8	76.11	75.85 (32:27)
7*	A <sub>b</sub>	Fourth partial (C: 256Hz) divided by five, then multiplied by two	102.4	101.60	101.14 (128:81)
8**	D	Third partial of G (D: 288Hz) divided by four	72	71.84	72 (9:8)
9	B <sub>b</sub>	Fourth partial of F (F: 341.33) divided by three	113.77***	114.04	113.77 (16:9)
10	D <sub>b</sub>	Fourth partial of F (F: 341.33Hz) divided by five	68.27	67.81	67.42 (256:243)
11	B	Third partial of E (B: 240Hz) divided by two	120	120.82	121.5 (243:128)
12	G <sub>b</sub> /F <sub>♯</sub>	Second partial of B <sub>b</sub> (B <sub>b</sub> : 227.56Hz) divided by five OR fifth partial of D (F <sub>♯</sub> : 360Hz) divided by four	91/ 90	90.51	91.13 (729:512)

Table 2.1: the corresponding frequencies of Hindemith's *Series 1*.

† These figures are taken from the *Craft* where there is a noticeable inconsistency in the number of decimal places. I round to two decimal places where necessary.

\* Hindemith backtracks to using the fourth overtone rather than the seventh.

\*\* Hindemith finds that he has exhausted the use of the overtones of the pitch of C (64Hz) and so experiments with other starting pitches to derive the remaining tones.

\*\*\* Hindemith gives this fraction as 113.78 in the original, rounding it to two decimal places.

Hindemith lists frequencies individually to explain Series 1, followed by a summary table on page 56. He is not consistent with his number of decimal places, which can lead to confusion. The best way to represent a frequency such as 85.3 recurring is as the fraction  $256/3$  as shown in the table below.<sup>68</sup> This both eliminates any discrepancy over decimal places and shows a greater transparency in Hindemith's derivation:

$$\frac{a(x+1)}{x} = \frac{64(x+1)}{x} = \frac{64 * 4}{3} = \frac{256}{3}$$

While not affecting the overall outcome of his *Series*, there is an error brought about by the inaccurate use of recurring decimals. When deriving the final pitch in Series 1 (G $\flat$ ), Hindemith offers two options: the first is the second partial of his B $\flat$  ( $1024/9$ ) divided by five, whereas the second is the fourth partial of his D $\flat$  ( $1024/15$ ) divided by three. The use of fractions show that the two operations arrive at an identical result, given the common numerators, and that when multiplying the denominators,  $9 * 5$  is the same as  $15 * 3$ . They both give a final frequency of 91.02. However, Hindemith writes that they give two different answers, one as 91.02 and the other as 91.03.<sup>69</sup> This is a consequence of using rounded (and therefore, imperfect) decimals left over from previous calculations rather than fractions. However, Hindemith arbitrarily discards the small decimal places in both instances to give 91, which means that this error is inconsequential to the final array of frequencies.

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<sup>68</sup> This tactic is also adopted by Halliday, John, 'Paul Hindemith – the Theorist' (University of Rochester, Eastman School of Music, PhD, 1941) in his translation of sections of the *Unterweisung*.

<sup>69</sup> *Craft* (1942) p. 41.

Order Number $x$	Pitch Class	Frequency $f^x$ (Hz)	Hindemith's Method	Formula
1	C	64†	$f^1$	$f^1$
2	G	96	$\frac{3}{2}f^1$	$\frac{f^1(x+1)}{x}$
3	F	256/3	$\frac{4}{3}f^1$	$\frac{f^1(x+1)}{x}$
4	A	320/3	$\frac{5}{3}f^1$	$\frac{f^1(x+1)}{x-1}$
5	E	80	$\frac{5}{4}f^1$	$\frac{f^1x}{x-1}$
6	E♭	386/5	$\frac{6}{5}f^1$	$\frac{f^1x}{x-1}$
7*	A♭	512/5	$2\left(\frac{4}{5}\right)f^1 = \frac{8}{5}f^1$	$\frac{f^1(x+1)}{x-2}$
8**	D	72	$\frac{3\left(\frac{3}{2}\right)}{4}f^1 = \frac{9}{8}f^1$	$\frac{f^1(x+1)}{x}$
9	B♭	1024/9	$\frac{4\left(\frac{4}{3}\right)}{3}f^1 = \frac{16}{9}f^1$	$\frac{f^1(x+7)}{x}$
10	D♭	1024/15	$\frac{4\left(\frac{4}{3}\right)}{5}f^1 = \frac{16}{15}f^1$	$\frac{f^1(x+7)}{x+5}$
11	B	120	$\frac{3\left(\frac{5}{4}\right)}{2}f^1 = \frac{15}{8}f^1$	$\frac{f^1(x+7)}{x+5}$
12	G♭ or F♯	91 or 90	$\frac{4\left(\frac{16}{15}\right)}{3}f^1 = \frac{64}{45}f^1$ or $\frac{5\left(\frac{9}{8}\right)}{4}f^1 = \frac{45}{32}f^1$	$\frac{f^1(x+62)}{x+33}$ or $\frac{f^1(x+33)}{x+20}$

Table 2.2: Hindemith's *Series 1* expressed algebraically to show derivational inconsistency.

Series 1 generates a temperament from the fundamental ‘tonic’ pitch. Hindemith states that ‘When the generating tone changes, the tiny differences in the intervals change with it’.<sup>70</sup> He also believed that the subtle differences in intonation when compared with an equal tempered approach (such as that offered by a keyboard instrument) were a positive nuance. Crucially to his preference for quartal pitch collections, the intervals of fifths and fourths are also preserved in their purest forms, without the compromises of equal temperament. His temperament is not always precise, however: the F# may be tuned to either 90Hz or 91Hz. These pitches fall either side of an F# tuned to 90.51Hz in equal temperament.

Hindemith decides on which frequency to use based on the proximity to neighbouring semitones in the order, such as his B<sub>b</sub>. The most important factor in the derivation of Series 1 is therefore for the movement of adjacent pitches to sound like steps rather than leaps.<sup>71</sup> While Hindemith acknowledges that there is a range of distances between semitones in his order – from roughly 15:16 to 18:19 – he believes that this spectrum of interval sizes is too small to be detected by the listener.<sup>72</sup> By equal tempered standards, Hindemith’s major third is slightly flat, and the minor third is slightly sharp. Despite the intricacies of his tuning, he unaccountably conflicts with his tempered system when stating:

I shall neither conjure away the comma nor suggest new structures of tempered series. I shall simply follow the suggestions which to the understanding ear lie hidden in the overtone series, and shall thus arrive at a simple and natural construction of the scale.<sup>73</sup>

Thomson (1952) believes that Hindemith’s Series 1 is actually a ‘by-product’ of Hindemith’s system of tuning.<sup>74</sup> In other words, he finds that Hindemith’s system is based first and foremost on temperament, followed by a hierarchy of pitches. In a sense, the frequency does

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<sup>70</sup> Ibid., p. 43.

<sup>71</sup> Ibid., p. 25.

<sup>72</sup> Ibid., pp. 42-3.

<sup>73</sup> Ibid., p. 33.

<sup>74</sup> Thomson, William, ‘A Clarification of the Tonality Concept’ (University of Indiana, PhD, 1952) p. 45.

‘come first’. However, the reason that Hindemith settled on each pitch was precisely because of its proximity to a discrete pitch in either Pythagorean or equal temperament. Therefore, while the procedure arrives at a frequency before a pitch, the motivation is to end on a pitch that is a suitable distance away from any other neighbouring semitones. To describe Series 1 primarily as a system of tuning is to confuse the means with the end. Thomson finds further that, ‘By omitting from his system of derivation those overtones which lie above the fifth (g’), Hindemith necessarily invalidates any other part of his system which might survive careful scrutiny. His denial that the B $\flat$  (224), the B $\flat$  (112) and the G $\flat$  (89.6) are useable reveals a lack of consistency.’ Thomson is unable to find justification in Hindemith’s denial of the seventh partial, as he finds that it makes the scale predetermined – and thus not a truly natural system.

Series 1 is not a dodecaphonic row. While it is intended to create a basic spectrum of relationships from which compositions may be constructed, it does not completely sever its bonds with tonality. Furthermore, dodecaphonic technique – unlike the diatonic system – is built on the premise that each pitch is of equal value. While not diatonic, we may still refer to Series 1 as a scale: in fact, Hindemith does this in the *Unterweisung* when he refers to ‘Tonleiterversuche’ (although translated by Mendel as scale-construction, a more literal translation would be scale-experiments).<sup>75</sup> However, Hindemith’s term ‘Reihe’, which is translated by Mendel as ‘Series’, is the same word used by Schoenberg to describe dodecaphony; but this should not confuse the significant differences between the two theories.<sup>76</sup>

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<sup>75</sup> *Unterweisung* (1937) p. 47.

<sup>76</sup> Discussed in Landau, Victor, ‘The Theories of Paul Hindemith in Relation to His Practice as a Composer’ (New York University, PhD, 1957) p. 47-8.

## 2.5 Series 2

Series 2 defines a hierarchy for intervals. Similar to Series 1, the hierarchy may occur on both a micro level, such as local interval progressions in a single phrase, and on a macro level, such as structural intervals spanning a complete movement. It also emphasises the prominence of the fifth and fourth over the third and sixth. However, it is not built upon the order of Series 1, despite many similarities, and it is derived via a different acoustic method.

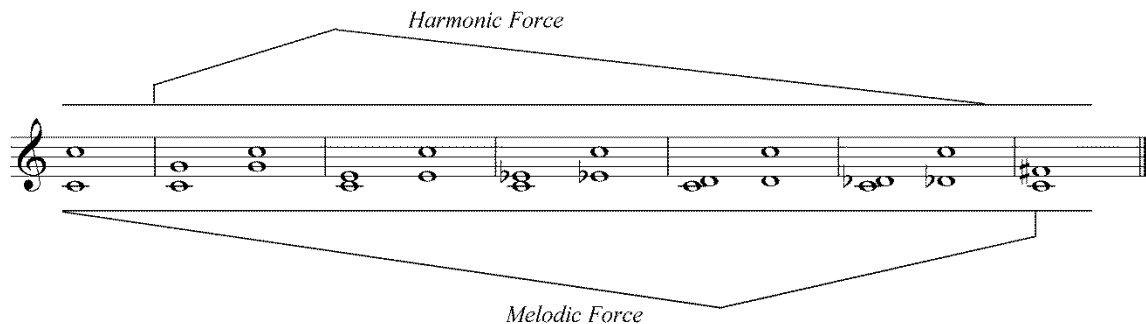
Hindemith constructs Series 2 from the acoustic phenomena of combination (difference) tones.<sup>77</sup> When an interval is sounded, it creates a spectrum of lower, 'imaginary' pitches. These are formed by nonlinearities inside the ear, and are therefore unlike overtones which are found in the sound wave itself. Difference tones enforce a pitch from below, whereas harmonic partials are heard above. Hindemith's theory of interval density, illustrated by Series 2, is therefore built upwards, rather than from above the interval downwards.

Using the acoustic resources of the Rundfunkversuchsstelle, Hindemith analysed first- and second-order difference tones to deduce which interval combinations have the most doubling.<sup>78</sup> For the fifth, this is chosen as the densest interval because the first two orders of difference tones coincide on the same pitch. The pitch 'reinforced' an octave below is the lower note of the interval (in this case, a C). Hindemith's results are displayed in the following diagram:

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<sup>77</sup> Hindemith's 'combination tone' is known more specifically as a 'difference tone'. The term 'combination tone' could also mean 'summation tone', which is not used in the *Unterweisung*.

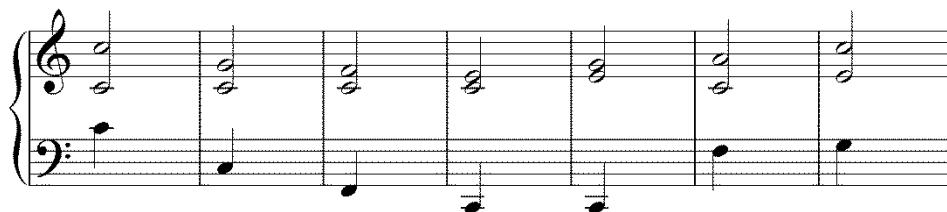
<sup>78</sup> Hindemith does not study combination tones of order number greater than two for reasons of audibility.



Example 2.8: Hindemith's Series 2.

The intervals are ranked by 'sustainability' (Mendel translates the difficult word *Tragfähigkeit* as 'strength'), 'hardness' and 'density'.<sup>79</sup> This relates to the two spectra of harmonic and melodic force on Hindemith's Series 2 diagram. It shows that the major third is the most harmonically 'strong' interval, and that the major third is the most melodically 'strong'.

Hindemith's engagement with the problem of consonance and dissonance in Series 2 is indebted to Helmholtz's *Die Lehre von dem Tonempfindungen* (1863), of which Hindemith owned a copy.<sup>80</sup> The following diagram shows a succession of difference tones which are ordered unison, fifth, fourth and major third. This is identical to the first half of Hindemith's Series 2, although it does not cover the second or seventh intervals. It also differs by ordering the major and minor thirds before the major and minor sixths.



Ex. 2.9: Helmholtz's diagram for difference tones taken from the English translation of *Die Lehre von dem Tonempfindungen* as *On the Sensations of Tone* (Dover, 1954) p. 154.

<sup>79</sup> 'Wir stellen also in dieser Reihe – der Reihe 2 – eine Liste über die Tragfähigkeit, den Härtegrad, die Dichte des einzelnen Bausteines auf.' This sentence, consistent with both the 1937 and 1940 editions of the *Unterweisung*, was altered by Mendel in his translation.

<sup>80</sup> The Blonay Bibliothek lists that Hindemith owned two texts by Helmholtz: *Über die physiologischen Ursachen der musikalischen Harmonie* (Braunschweig, 1865) and the second edition of *Die Lehre von dem Tonempfindungen* (Braunschweig, 1877).

The derivation of Series 2 in the *Unterweisung* is incomplete, and the reader is provided with less detail by comparison with Series 1. Notwithstanding a collection of graphs – which demonstrate Hindemith’s work in the Rundfunkversuchsstelle – there is insufficient evidence for how he derives the second, seventh and tritone intervals.<sup>81</sup> The information that Hindemith does supply is collected in example 2.9:

Combination Tones:  
 ○ 1st Order  
 ◇ 2nd Order

Example 2.9: Hindemith’s combination tones.

The gap is the result of Hindemith using ‘practical considerations’ rather than difference tones for the second, seventh and tritone intervals.<sup>82</sup> He writes that ‘the combination tones do not point to definite conclusions’ for the major second and minor seventh.<sup>83</sup> Therefore, he resorts to following the pattern of the previous intervals, but without a scientific basis. Similar to Series 1, when Hindemith finds that acoustics do not provide the results that he requires, he arbitrarily selects pitches to fit a premeditated system. This undermines his credibility once again. Thomson (1952) fills the gap and provides us with the remaining combination tones used by Hindemith, but which were omitted in the *Unterweisung*. This forms the definitive illustration of Series 2:

<sup>81</sup> Hindemith’s combination tone diagrams, created with the help of colleagues in the Rundfunkversuchsstelle, show his empirical research. There is a notable difference in the typesetting of Hindemith’s difference tone diagrams between the *Unterweisung* (1937 & 1940) and the *Craft* (1942).

<sup>82</sup> *Craft* (1942) p. 80.

<sup>83</sup> *Ibid.*, p. 79.

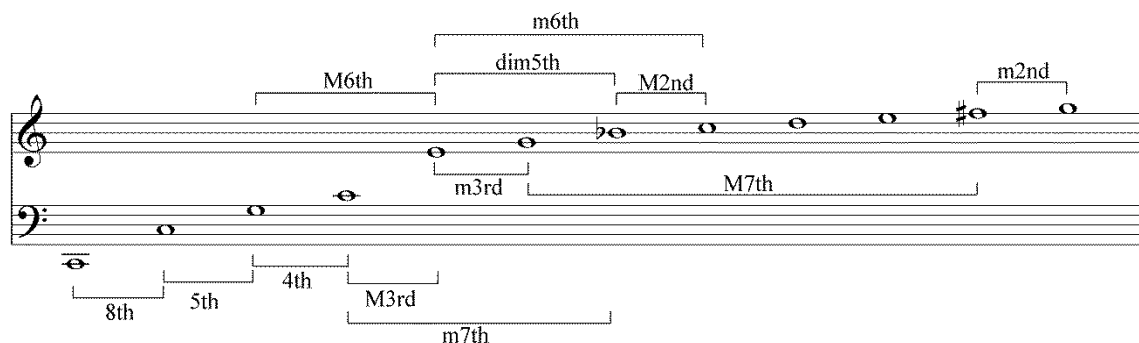
◆ - 1st order  
◇ - 2nd order

Example 2.10: Hindemith's Series 2 with all difference tones.

Hindemith does not provide an adequate explanation for choosing difference tones rather than overtones to derive Series 2.<sup>84</sup> The selective use of overtones had been used before to derive the major triad, for example; and one may find every type of interval within the overtone spectrum. Below is a diagram offering one method (of many) for deriving the twelve different intervals from overtones. One may choose to exclude the seventh and eleventh partials (B $\flat$  and F $\sharp$ ) as these differ significantly from equal temperament. The order of intervals below begins similarly to Series 2, but then differs dramatically. Perhaps due to the chaotic disposition of intervals in the overtone series, and the 'out of tune' partials, Hindemith chose to use difference tones to derive his order of intervals.

There is one further advantage to be gained from using difference tones rather than harmonic partials: difference tones, by definition, can only exist when two or more individual voices sound, whereas harmonic partials can occur from a single pitch. It is therefore more intuitive to use difference tones to derive a hierarchy of intervallic relationships, despite the fact that harmonic partials have been verticalized to argue that the major triad is a natural phenomenon since the theory of Rameau.

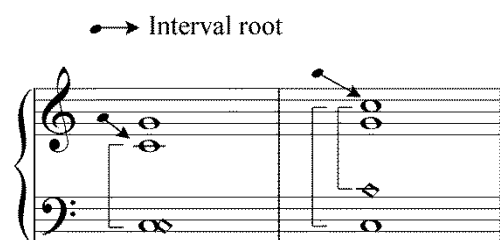
<sup>84</sup> Thomson, William, 'A Clarification of the Tonality Concept' (University of Indiana, PhD, 1952) p. 74, finds Hindemith's use of combination tones unnecessarily complicated.



Example 2.11: overtone series interval analysis.

## 2.6 Theory of Chord ‘Value’

Hindemith uses Series 2 and combination tones to create a theory of chord roots. He observes that, for any given interval, the first- and second-order difference tones double one pitch more than the other. For example, Hindemith shows that the root of the interval of a fifth is the lower tone (ex. 2.13), as the difference tones of the fifth double the lower note, thus giving it greater ‘weight’. He then uses this as proof to show that the interval of a fourth is weaker than a fifth given that it is the upper tone that is doubled by the difference tones.



Ex. 2.13: Interval roots taken from the *Craft*, p. 68.

Hindemith pioneers a method for deriving the root of a chord with more than two pitches. This begins with the selection of a ‘best’ interval within the chord, which is determined by the Series 2 hierarchy. The root of the ‘best’ interval determines the root of the chord. If, as may often be the case, a chord contains several ‘best’ intervals then we are instructed to take

the lowest. An analysis of roots over time is called the ‘harmonic degree-progression’, which also relates to harmonic tension and background structure.

The *Craft* frequently refers to the tritone. It is of great interest to Hindemith, both because of its ambiguity, and its opposition to his favoured intervals of the fourth and fifth. In this regard, he outlines the ‘root representative’. In conventional harmonic theory, the tritone resolves in contrary motion, where the top note moves up and the lower note moves down (although sometimes one of these may remain at the same pitch). Of these two notes, one note generally moves by a tone and the other by a semitone – the note that moves by the smaller step is the root representative. This pitch is identified because the tritone, by virtue of its ambiguity, has no clear root and avoids classification. Therefore, the root representative is identified to define voice leading. In many of Hindemith’s examples, an unstable tritone chord resolves to a quartal chord.<sup>85</sup>

●→	Interval root
[	Best interval (also used later in the <i>Craft</i> to identify a tritone)
›→	Root representative

Using all of his theory up to this stage, Hindemith proceeds to debate four main points from what he describes as the ‘conventional theory of harmony’.<sup>86</sup> Not all of these ideas are connected to the speculative concepts of Series 1 and 2. They are introduced as follows:

1. The basic principle for the construction of chords is the superposition of thirds.
2. Chords are considered invertible.
3. By raising or lowering tones of the diatonic scale the chord-supply of a key may be enriched.
4. Chords are susceptible of various interpretations.

To demonstrate the second point Hindemith offers three chords – which are not built up exclusively in thirds – that ‘lose all sense of identification’ if they are inverted:

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<sup>85</sup> *Craft* (1942) pp. 128-9, ex. 84c, 85b, 87a and 88c.

<sup>86</sup> *Ibid.*, p. 90.



Example 2.14: Chords incapable of inversion taken from the *Craft*, p. 91.

As a consequence of his critique of conventional harmony, Hindemith defines new rules for the analysis of chords. The most important definitions are as follows:

1. Chords are a group of at least three different tones sounding simultaneously.
2. Chord inversion is the transposition of the root into the upper part rather than the rearrangement of the pitches.
3. Chords are classified into two groups, A and B: chords without tritones and chords with tritones.

Most notably, the system used in the *Craft* to analyse chords is intended to be completely comprehensive; Hindemith states that ‘there is no combination of intervals which does not fit into some division of our system’.<sup>87</sup> Example 2.15 shows his complete list:

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<sup>87</sup> Ibid., p. 105.

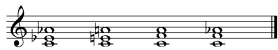
## Table of Chord-Groups

### I Without seconds or sevenths

1. Root and bass tone are identical

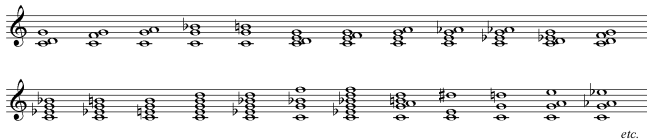


2. Root lies above the bass tone



### III Containing seconds or sevenths or both

1. Root and bass tone are identical



2. Root lies above the bass tone



### V Indeterminate



### II Without minor seconds or major sevenths

#### The tritone subordinate

a With minor seventh only (no major second)

Root and bass tone are identical



b Containing major seconds or minor sevenths or both

1. Root and bass tone are identical



2. Root lies above the bass tone



3. Containing more than one tritone



### IV Containing minor seconds or

#### major sevenths or both

#### One or more tritones subordinate

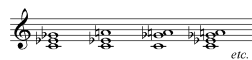
1. Root and bass tone are identical



2. Root lies above the bass tone



### V Indeterminate. Tritone predominating



Ex. 2.15: Chord groups taken from the *Craft*, p. 224-225.

Hindemith's chord groups define value. This is not context-dependent, unlike much previous music theory. In this way, it also precursors pitch class set theory. Hindemith sums this up by stating:

in contrast to the conventional theory of harmony, in which all tones and tone-combinations are ranked according to their relation to an *a priori* tonal scheme, and thus have only relative values, our system attributes a fixed value to each.<sup>88</sup>

<sup>88</sup> Ibid., p. 108.

Hindemith's analyses attach importance to the identification of chord by terms of these groupings. They should not be confused with the diatonic Roman numeral system: the figure III<sub>1</sub> refers to any of the chords in group three, section one of the table, rather than a form of the mediant, according to conventional harmonic theory.

## 2.7 Practical Application

The practical application of Series 1 and 2 is not clear in Hindemith's writing. While he includes a section entitled 'practical application' in *Unterweisung I*, it does not answer the necessary questions, and it appears, nonsensically, before Hindemith's theory of melody. It also concerns a short progression in five parts, which is far removed from a work of free composition, although Hindemith justifies his approach:

The conditions which I have set for myself in the treatment of the following example are far harder than one would ever find in actual music. I have purposely chosen so artificially complicated a case to show that even such problems can be solved. How much easier then must the solution of the problems of free composition, which can never contain more than a small fraction of the difficulties of the following problem!<sup>89</sup>

The diagram illustrates a chord progression over nine measures. The top staff shows the full chord voicings with a circled '177' in the margin. A bracket under the first two measures is labeled 'J = Tritone'. Below this are three staves: 'Two-Voice Framework' showing the outer voices, 'Guide-Tones' showing the third and seventh of each chord, and 'Roots (Degree-Progression)' showing the root movement. The 'Harmonic Fluctuation' row lists Roman numerals: IV<sub>1</sub>, III<sub>1</sub>, IV<sub>2</sub>, IV<sub>1</sub>, III<sub>1</sub>, IV<sub>2</sub>, IV<sub>1</sub>, III<sub>1</sub>, I<sub>1</sub>. At the bottom, two wedge-shaped diagrams represent the 'Intended Design of Harmonic Tension' and the 'Actual Design of Harmonic Tension', both showing a peak in the middle of the progression.

Example 2.16: the first diagram in Hindemith's 'practical application', *Craft* (1942) p. 158.

<sup>89</sup> Ibid., p. 157.

While there is not an explicit ‘student’ in Hindemith’s practical application case study, he parallels the Socratic Dialogue in Fux’s *Gradus* pedagogical approach, whereby a poor example is provided, and then corrected. Hindemith identifies the weakness of this progression on six grounds:

1. Linear construction (melody)
2. Two-voice framework (the counterpoint between the two outer voices)
3. Harmonic fluctuation (the organisation of harmonic tension)
4. Degree-progression (voice-leading between chord roots)
5. Guide-tones (voice-leading between tritones)
6. Tonality (movement of tonal centre)

For the first point, Hindemith acknowledges that he has not introduced his theory of melody at this point in the book and that he will ‘therefore leave this aspect of the matter for now with the assertion that the lines are poor’.<sup>90</sup> This is symptomatic of the poor layout of the *Unterweisung* text. For the second and third points, ‘no plan is apparent’ – Hindemith stresses the need for a clear, deliberate design for the outer-voice counterpoint and harmonic fluctuation. The fourth, fifth and sixth areas are problematic on the grounds that they do not allow ‘any harmonic life to unfold’ and that they stand ‘still in their tracks’.<sup>91</sup>

The following diagram offers Hindemith’s revisions, based on *Unterweisung* theory. It shows an emphasis on traditional major and minor chords (numbered 1 and 9), and quartal pitch collections (numbered 2, and within 3 and 5). There is also a quartal structure in the degree progression, from five to seven [B $\flat$  E $\flat$  G $\sharp$ ] which comprises pc-set 3-9. If we relate this to the ‘tonic’ C $\sharp$ , it adds another fourth to the quartal collection to comprise pc-set 4-23 [B $\flat$  E $\flat$  G $\sharp$  C $\sharp$ ]. The tritone (identified with square brackets) is used with greater restraint, and only

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<sup>90</sup> Ibid., p. 159.

<sup>91</sup> Ibid.

occurs in one form per chord. The passage is harmonically clearer, and is both more tonal and conventional.

(121)

Final Degree-Progression	
Improved Plan of Fluctuation	I <sub>1</sub> III <sub>1</sub> III <sub>2</sub> IV <sub>1</sub> IV <sub>2</sub> III <sub>2</sub> III <sub>2</sub> IIb <sub>2</sub> I <sub>1</sub>
Final Version	
Guide-Tones	

Example 2.17: the final diagram in Hindemith's 'practical application', *Craft* (1942) p. 162.

## 2.8 The *Unterweisung* Analytic Method

Hindemith uses the following terms for his theory of melody, in the penultimate section of the *Unterweisung*:

W	Changing tone (returning tone) [Wechselton]
D	Passing tone [Durchgang]
V	Suspension [Vorhalt]
N	Unprepared suspension (neighbouring tone) [Nebenton]
N̄	Neighbouring tone left by leap
~N	Neighbouring tone approached by leap
V̄	Anticipation [Vorausnahme]
F	Unaccented free tone
F̂	Accented free tone

There are strong similarities here between Hindemith and Schenker. The two *Unterweisung* editions (1937 and 1940) acknowledge the contribution of Hermann Roth, who proof-read and commented upon Hindemith's drafts. A student of Hugo Riemann (1905), Roth corresponded with Schenker frequently from 1912-32, before they ceased contact for 'personal' reasons.<sup>92</sup> This connection may have been responsible for the inclusion of one of Roth's second-species counterpoint exercises by Forte & Gilbert (1982) in the second

<sup>92</sup> Taken from 'Hermann Roth' *Schenker Documents Online* (<http://www.schenkerdocumentsonline.org/profiles/person/entity-000737.html#correspondence>) accessed 19 February 2013.

chapter, ‘Voice Leading: Counterpoint and Figured Bass’ of *Introduction to Schenkerian Analysis*.<sup>93</sup> It is likely that Roth influenced Hindemith’s description of melody and his understanding of structural levels.

Hindemith uses his theory of melody to create structural levels, shown in example 2.16. This is described as the melodic degree-progression. Hindemith states that the melodic degree-progression ‘tells whether the harmonic construction of a melody is logical and appropriate’.<sup>94</sup> A melodic degree-progression is held in dotted brackets and is concisely defined as ‘notes which can be heard without effort as a harmonically related group’.<sup>95</sup> By identifying melodic degree-progressions, Hindemith describes the harmonic course of the melody.

Moderately fast

D (W) D N' W D W

Degree-Progression

Ex. 2.16: Hindemith’s first demonstration of melodic degree-progression from the *Craft* (1942), p. 184.

Hindemith also theorises a separate ‘melodic step-progression’, despite its analogy with melodic degree-progression. It is defined as ‘the line that connects one high point to the next, one low point to the next, and one rhythmically prominent tone to the next, without taking into consideration the less important parts of the melody lying between these points’.<sup>96</sup>

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<sup>93</sup> Forte, Allen & Gilbert, Steven E., *Introduction to Schenkerian Analysis* (New York: W. W. Norton & Co., 1982) p. 44.

<sup>94</sup> *Craft* (1942) p. 183.

<sup>95</sup> *Ibid.*, p. 183.

<sup>96</sup> *Ibid.*, pp. 193-4.

Hindemith believed that his music theory was sufficiently general as to be capable of analysing any composition in Western music. To this effect, he includes seven analyses at the end of *Unterweisung I*, covering the following compositions:

1. Plainchant, *Dies Irae*
2. Guillaume de Machaut, *Ballade 'Il m'est avis'*
3. J. S. Bach, *Three-Part Invention in F Minor*
4. Richard Wagner, *Tristan und Isolde*, 'Prelude'
5. Igor Stravinsky, *Piano Sonata 1924*, first movement
6. Arnold Schoenberg, *Klavierstück*, op. 33a
7. Paul Hindemith, *Mathis der Maler*, Prelude

This list is notable not only for its breadth (c. 1200 – 1935), but for the peculiar gap in music from Bach to Wagner; the omission of music in the Classical Style. This omission is the centre of Schenker's work. While many of Hindemith's melodic concepts are indebted to Schenker, and transferred by Roth, he (perhaps consciously) avoids the same repertoire.

Below is Hindemith's analysis of the opening to Wagner's *Tristan und Isolde*, 'Prelude'. It includes four levels: harmonic fluctuation, two-voice framework, (harmonic) degree-progression and tonality. The application of four levels is arbitrary; Hindemith applies only two to Gregorian chant (degree progression and step progression) and seven to Machaut (main voice, melodic degree-progression, melodic step-progression, two-voice framework, harmonic fluctuation, harmonic degree-progression and tonality). Hindemith's analysis shows Wagner's emphasis on contrary motion by identifying the two-voice framework. The study of harmonic fluctuation also provides a way of measuring varying tension ('ebb and flow'), by noting which harmonies include tritones.<sup>97</sup> Finally the representation of tonality provides an original method for deriving the tonic of A.

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<sup>97</sup> Ibid., p. 214.

1. Fluctuation

2. Two-voice Framework

3. Degree Progression

4. Tonality

dom.

Ex. 2.17: Hindemith's analysis of the opening to Wagner's *Tristan und Isolde*, 'Prelude', from *Craft* (1942), pp. 210-211.

## 2.9 Conclusions

The identity of the *Unterweisung* is defined by Hindemith's ideological position and motivations. His work on music theory arose first and foremost as a solution to his teaching requirements in Berlin. It also represented an attempt to get to know, and refine, his style.

This was associated with the change in his compositional approach from the

experimentalism and eclecticism of the 1920s to a more consistent, conservative and personal manner represented from *Mathis der Maler* (1934) onwards. Aspects of this style may be deduced from his 'practical application'. The integration of Kepler's theories of planetary motion is, however, wholly speculative and conflicts with these goals. It is ambitiously introduced to define a universal theory of music, and confuses the *Unterweisung* status. Hindemith wrote the first two volumes of a chromatic, hierarchy-based Fuxian counterpoint, but without the complete volumes in three- and four-part counterpoint it lacks an explicit relevance to free composition.

However, there are many positive and successful areas of Hindemith's theory. In Dunsby & Whittall (1988), *Music Analysis in Theory and Practice*, Hindemith's analyses are offered as insightful comparative studies, accompanied by the statement that Hindemith 'may yet come to be regarded as a minor hero of analytical theory'.<sup>98</sup> His analyses, while inherently tonal, do not rely upon triadic harmony. They do not therefore carry the same limitations as Schenker's *Ursatz*, and may be applied to the extended harmonic language of the early twentieth century.

Unfortunately, much of the practical application is unclear, incomplete, and based on a subjectivity that conflicts with the pseudo-scientific identity of Series 1 and 2. There are further issues with the expression, and derivation, of Series 1 and 2. This particularly concerns the seemingly arbitrary derivation of Series 1, and the missing difference tone information of Series 2 to derive the second, seventh and tritone. Furthermore, the layout of

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<sup>98</sup> Dunsby J. & Whittall, A., *Music Analysis in Theory and Practice* (London: Faber, 1988) pp. 86-8.

the *Unterweisung* introduces harmony, melody, and practical application in an unintuitive, illogical order.

Hindemith makes the practical implications of the 'new' Series 1 temperament unclear. On the one hand, he constructs a chromatic hierarchy by deriving frequencies. On the other, he does not seem to want the intonation of live performance to follow it. However, one of the strengths is the Pythagorean (mean-tone) tuning of the fourth and fifth. The prominence of these intervals in *Unterweisung* theory is therefore articulated not only by their presence at the beginning of Series 1, but by their tuning.

The lack of clarity in Hindemith's practical application of *Unterweisung* concepts is a major stumbling block in his writing. Not every area lends itself well to analysis, such as melodic step-progression, which is introduced only as a vague concept, and is almost synonymous with melodic degree-progression. However, there is an emphasis of the fourth and fifth, which is developed by Series 1, Series 2, and chord value. The next chapter develops a new set theory of quartal pitch relationships and voice leading to facilitate this analysis.

### Chapter 3 Theoretical Method, Quartal Set Properties and Prolongation

This thesis analyses the music of Hindemith, primarily to show how the *Unterweisung* principles of pitch, voice leading, and character, may be found in his music. It also analyses his music to show how his early compositions were influenced by the repertoire that he studied concurrently as a performer. To achieve these goals, the analytical approach needs to synthesise both set theory and voice leading reduction. This chapter introduces and engages with some of the issues raised by using these analytical methods, including segmentation problems, large quartal pitch collections, and voice-leading reductions, and develops an original theory of quartal pitch collection ‘incompleteness’. It also places these within the context of Hindemith’s own theory work.

The coherence of Hindemith’s music, from his eclectic early style to his (comparatively) conservative *Unterweisung* style, rather than resting on the stability effects of diatonic harmony, or the voice leading logic of chromatic transformations within a tonal network, can be understood with reference to salient compositional elements, as defined by Lerdahl (1989).<sup>99</sup> Hindemith’s pitch structures may be made salient by their metrical position, such as a chord on a strong beat within a bar. Salience may also be created by the groupings of bar lines and musical phrases, motif, dynamic, rhythmic duration, timbral prominence and registral position. The importance of repetition is also added to this list.<sup>100</sup> These conditions of salience can be used as guidelines for pitch segmentation and voice leading interpretation.

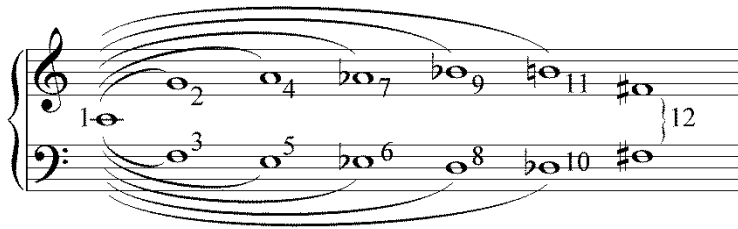
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<sup>99</sup> These are adapted from Lerdahl’s own ‘salience conditions’: Lerdahl, Fred, ‘Atonal Prolongational Structure’ *Contemporary Music Review* Vol. 4 (1989) pp. 65-87.

<sup>100</sup> Repetition, which may create salience, is not included in Lerdahl’s list (Ibidem).

### 3.1 Set Theory and Quartal Harmony

Hindemith's manipulation of harmonic partials, which provide his Series 1 order of pitches, is an outline of quartal harmony: in other words, a group of pitches ordered by fourths and fifths. This is a fundamental character of his harmony, which was present, to a degree, in his early music, and then grew to greater prominence in parallel with his theory making.<sup>101</sup> Hindemith presents a teleological argument for the omnipresence of the fourth and fifth in nature, by manipulating overtones and combinations tones. Rameau (1722) had also used overtones as a basis for his music theory two centuries earlier, although his conclusions differ. Most crucially, Hindemith orders all intervals and pitches in a chromatic, rather than diatonic, space. His first order, Series 1, has been illustrated by Taruskin (2005) to show a concentric relationship.<sup>102</sup> Hindemith does not acknowledge this arrangement in the *Unterweisung*, which is surprising given his own propensity for symmetrical scales.



Example 3.1: Taruskin's arrangement of Series 1, from *The Oxford History of Western Music* (2005) p. 768.

<sup>101</sup> The following description, taken from Mellon, W. H., 'Hindemith Today' *The Chesterian* (September, 1947) p. 33, is typical of the way Hindemith's harmony was defined before the term 'quartal harmony' came into usage. It is also relevant that the author attempts to tie this to the general style of significant North American composers: '...the vocal and melodic contour of some of its [Hindemith's Eb Symphony] lines give it a robust sanity that at times almost suggests the later work of Vaughan Williams; just as certain pentatonic figurations [which can be described as quartal 5-35 collections] and the transparently hollow figurations and the transparently hollow spacings in Hindemith's late work remind one of the American idiom of Aaron Copland. I do not mean that Hindemith has been consciously influenced by either Vaughan Williams or Copland; but it is possible that, in becoming an American citizen, he has absorbed into his German training and outlook something of the sturdy Puritanism which Vaughan Williams still stands for, and which is reborn in the New England culture of the most significant composers of the USA.'

<sup>102</sup> Taruskin, Richard, *The Oxford History of Western Music*, Vol. 4 (2005) p. 768. Taruskin does not mention, however, that his concentric arrangement does not form perfect symmetry around the seventh and eighth degrees, A $\flat$  and E $\flat$ .

Further symmetry exists in Series 1. Importantly, this also relates it to the quartal pitch collections 3-9, 4-23, 5-35 and 6-32. The following diagram shows how the outer trichords both form pc-set 3-9, leaving an inner space of six pitches. If we swap the A and D pitches from this inner group, there are two chromatic trichords spaced an augmented fourth apart.

Example 3.2: quartal trichords in Series 1.

Having observed that the outer pitches form Hindemith trichords, the following result is obtained by swapping the inner pitches of A and B:

Example 3.3: quartal tetrachords in Series 1, with pitch rotation.

Moving in by step, the outer pitch collections form 5-35, and 6-32:

Example 3.4: quartal pentachords and hexachords in Series 1, with pitch rotation.

This process utilises basic set theory, as defined by Allen Forte (1973), to identify pitch structure, which provides an internationally recognised system of generalising pitch-class relationships. It shows that Hindemith favoured symmetrical scale relationships, and that his use of Series 1 is connected to the prevalence of quartal pitch collections in his music.<sup>103</sup> Moreover, it shows that symmetrical manipulations of Series 1 will also produce quartal pitch collections.

Links between Hindemith's music theory and quartal harmony may also be traced in his musical examples. Example 3.5 is taken from *Craft I* (1942), from the melody degree-progression section. Hindemith uses it to showcase his method for melodic segmentation, in addition to his voice leading terms: *Durchgang* (**D**) for 'passing tone', *Wechselton* (**W**) for 'returning tone', *abspringender Nebenton* (**N**↘) for 'neighbouring tone left by leap' and *anspringender Nebenton* (**N**↗) for 'neighbouring tone approached by leap'.<sup>104</sup> Hindemith's melody example contains quartal collections on foreground and background levels, the first segment comprising pc-set 5-35, while his background level consists of exactly the same pitches in semibreve form.

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<sup>103</sup> Hindemith's preference for scale symmetry is also mentioned in Neumeyer, David, 'Counterpoint and Pitch Structure in the Early Music of Hindemith' (Yale University, PhD, 1976) pp. 45-53.

<sup>104</sup> *Craft I* (1942) p. 173.

Example 3.5: a transcription of Hindemith's example 155, taken from *Craft* (1942) p. 184, showing melody degree-progression.

*Apparebit Repentina Dies* (1947) combines mixed chorus with a brass dectet. On the inside cover of the score it states that the work was written for a symposium on music criticism at Harvard University. Typical of this stage in Hindemith's compositional output, the setting is strongly characterised by quartal harmony, in addition to a concern for the melodic quality of individual, contrapuntal parts. In other words, each line must represent a strong melody on the terms of *Unterweisung II* (exercises in two-part writing). The central motif is three bars in duration and begins at bar five, shown in example 3.6. A diatonic or modal reading of this passage could be:

1. D $\flat$  major, with shades of an A $\flat$  major-minor polarity
2. A $\flat$  Mixolydian mode
3. The motif begins in A $\flat$  major, passes through G $\flat$  major in bar six, then moves back towards A $\flat$  major

However, these versions struggle with the way the motif then ends on a B $\flat$ . If we were to understand this passage in terms of quartal harmony, then the solution lies in bar five. The motif may be segmented as follows:

Example 3.6: *Apparebit Repentina Dies*, bb. 1-8.

The second and third bars of motif X comprise the quartal sets 3-9 and 4-23 respectively, which together form 5-35.<sup>105</sup> The first bar is incomplete: while it consists of two fourths [F C] and [A $\flat$  E $\flat$ ], it is missing the B $\flat$  needed to make it into an ordered quartal set [A $\flat$  E $\flat$  **B $\flat$**  F C]. This explains why the motif ends on a B $\flat$ , rather than the implied tonic of A $\flat$ ; it completes the ordered quartal set. The opening three bars also outline a strong pattern of ascending fourths, comprising 4-23.

In this example, the use of pitch class sets assumes octave equivalence, set cardinality, subsets, and supersets, as a method for identifying the characteristics of each collection. It permits an examination of how quartal sets (such as 3-9 and 4-23), delineated by bar lines, can be grouped together into larger supersets. In this sense it parallels the motivic cells of the Classical sentence structure, whereby a full phrase may be broken down into small motifs.

<sup>105</sup> Pc-set 5-35, otherwise known as the pentatonic scale, was acknowledged by Hindemith on many occasions, but as a non-Western scale. The following passage is taken from *Polluted Waters*, p. 4, 'We can see first in the keys the tonal system which was the earliest to be developed in our western culture through the practice of singing and instrumental playing, hundreds of years before the time of the first keyboards. The black keys give us a picture of that pentatonic, five-note system. Its smallest steps are the whole tone and the minor third. Numerous traces of this system are still found today in the folksongs of many areas, especially in the Celtic and Anglo-Saxon world; however, it also plays an important role in the East, especially in classical Chinese music.' Surprising here is that he does not acknowledge the pentatonic scale in his own music, although he does proceed to acknowledge its presence within the diatonic scale.

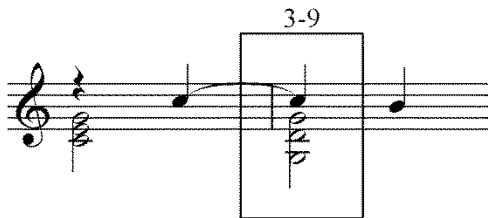
Segmenting music in this way is not always straightforward, however, and it must take place within a stylistic context. There are two main traps, the first of which involves the location of small quartal sets, such as 3-9. This is often at the core of Hindemith's music, such as the following passage, taken from the first movement of his *Flute Sonata* (1936). Note how the phrase markings in the flute part in bars five, six and seven coincide precisely with quartal collections 3-9 and 4-23, with the exception of a C passing note in the upbeat to bar seven.

Example 3.7: *Flute Sonata* (1936), first movement, bar 6.

Another explicit example is the succession of 3-9 and 4-23 collections in bars 1-2 of the second of *Six Chansons* (1939):

Example 3.8: *Six Chansons* (1939), no. 2 bb. 1-2.

However, in the following example it is again possible to identify a 3-9 trichord. And yet this is not an accurate representation of the musical surface; the example was taken from Hindemith's book on *Traditional Harmony*, where he demonstrates the resolution of a conventional 4-3 suspension. The 3-9 trichord is simply a by-product of the counterpoint, and it describes a dissonant, rather than consonant event. The majority of Hindemith's compositions, by contrast, treat quartal pitch collections as consonant.



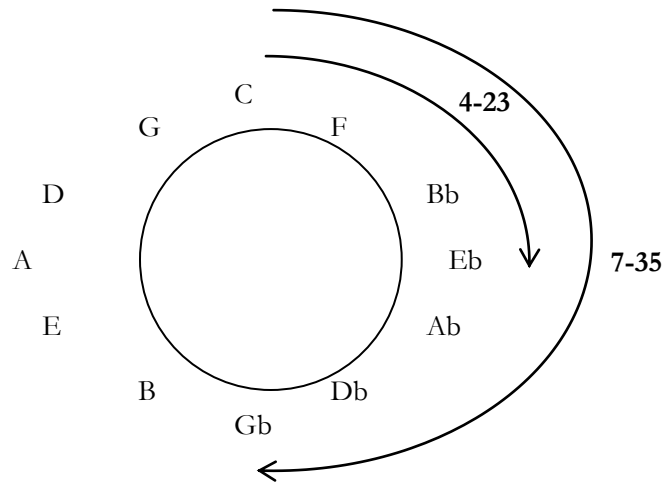
Example 3.9: Hindemith, *Traditional Harmony* (1943) p. 39.

Large quartal sets also present an issue for segmentation, since the quartal septachord 7-35 is identical to the diatonic scale, with the consequence that any quartal set of seven or fewer notes (3-9, 4-23, 5-35, 6-32, 7-35) may be found within the diatonic scale.<sup>106</sup> By pushing the cardinality higher than seven, quartal pitch collections will eventually become identical to the chromatic scale, with the risk that clearly chromatic passages within a diatonic framework could be erroneously (and vacuously) analysed in quartal terms. The solution within Hindemith's music is therefore to rely on salience features and prolongational characteristics. This is particularly evident in my analysis of his early music in chapter four, where this analytical process is applied and developed.

Quartal harmony may be viewed as a circle of fourths, shown in example 3.10. The entire image comprises the chromatic scale, where any group of adjacent pitches comprises a

<sup>106</sup> The major scale (7-35) is also equivalent to each scale in the twentieth century jazz mode system, such as the Dorian, Ionian and Aeolian scale. The Mixolydian mode, in particular, may be traced in Hindemith's quartal collections.

quartal collection (3-9, 4-23 and so on). The dotted lines offer one version of the 7-35 set, which in this instance is either a quartal pitch collection, or the diatonic scale of Db major. This collection is also identical to one of Hindemith's unpublished blackboard fugues, which is discussed in chapter five as example 5.58.



Example 3.10: the circle of fourths (the circle of fifths in reverse).

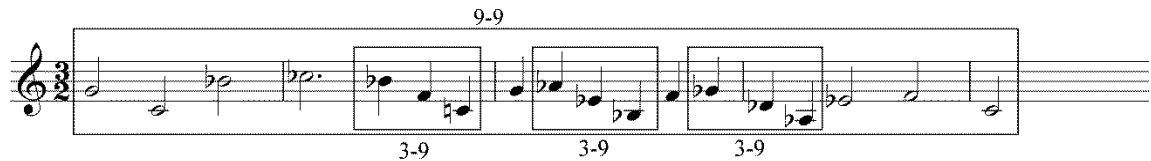
To highlight the potential for confusion between quartal collections and other scales, the following table lists the number of major, minor, octatonic and whole tone subsets for each category. The major scale generates the largest number of quartal collections, whereas the octatonic scale is not capable of producing any quartal subsets.

Quartal Subsets	Major Scale (7-35)	Minor Harmonic Scale (7-32)	Octatonic Scale (8-28)	Whole Tone Scale (6-35)
3-9	5	2	0	0
4-23	4	1	0	0
5-35	3	0	0	0
6-32	2	0	0	0

Table 3.1: Quartal subsets.

While the overlap between conventional scales and quartal collections problematises my analyses, it is overcome by considering how the elements of these collections are salient within the music. Take the fugue subject of the *Sonata for Two Pianos* (1942) as an example. It

is visually and audibly based on quartal collections, which contribute both to distinctive voice leading patterns that emphasise fourth and fifth intervals, and the overall harmonic character of a quartal collection. It also emphasises quartal trichord patterns, which move progressively in a clockwise direction around the circle of fourths. This creates a method for identifying quartal pitch collections that move in cycles. Another cycle may be found in *Marienleben II* (1948), referenced later in this thesis in chapter six, example 6.19: in this instance, it is used to show that quartal pitch cycles form part of Hindemith's post-*Unterweisung* compositional technique, as the cycle is not present in the earlier 1923 version.



Example 3.11: Hindemith's *Sonata for Two Pianos*, fifth movement, fugue subject bb. 1-5.

Since quartal pitch collections may be represented by a cycle of fourths, the complement of any quartal pitch collection is also quartal, as represented in the following table. This relationship emphasises that large collections of cardinality greater than seven (such as the diatonic scale) may still be understood as quartal, providing that fourth relationships are salient. Quartal pitch complementation applies to the previous example (3.11), where the large set 9-9 emphasises quartal pitch relationships. The 3-9 cycle of subsets within this collection form its complement.

Quartal pc-set	Complement
3-9	9-9
4-23	8-23
5-35	7-35
6-32	6-32
7-35	5-35
8-23	4-23
9-9	3-9

Table 3.2: Quartal set complements.

Hindemith's Series 2 order of intervals and interval inversions is similar to the set-theoretical concept of interval class. In the *Unterweisung*, Hindemith uses bar lines to group each interval pair in Series 2 together: fifths and fourth, major third and minor sixth, minor third and major sixth, major second and minor seventh, minor second and major seventh, and the tritone. Both Series 2 and interval classes are based on the inversion of intervals, up to and including the tritone. However, they treat these inversions in different ways. Interval classes assume equivalence between each inversion pair, such as the major second and minor seventh, or the minor third and major sixth. While Hindemith groups the intervals in the same way, he ascribes a root to each interval, such that the lower pitch of a fifth is root, whereas the upper root of a fourth is the root, and so forth. The inversions are therefore not equivalent. As a result of this, Hindemith recognises the interval of a fifth, while interval classes understand it as an equivalent inversion of the fourth, and do not exceed the tritone.<sup>107</sup>



Example 3.12: Hindemith's Series 2.

The interval vectors for quartal pitch collections are listed in table 3.3. There are several notable patterns. Unsurprisingly, the interval of a fourth is the most common interval in every set. More revealing is that the most common collections in Hindemith's music, 3-9, 4-23 and 5-35, contain no semitones. This could account for an aspect of Hindemith compositional process, in which he contrasts quartal collections with more seemingly 'chromatic' material. It also isolates one of the main challenges to Hindemith's compositional technique: creating harmonic variety.

<sup>107</sup> Forte, Allen, *The Structure of Atonal Music* (Yale University Press, 1973) p. 14, defines interval classes as follows: 'If  $d$  is the difference of two pc integers then  $d \equiv d^! \pmod{12}$ .'

Quartal pc-set	Interval (ic) Vector
3-9	010020
4-23	021030
5-35	032140
6-32	143250
7-35	254361
8-23	465472
9-9	676683

Table 3.3: Quartal IC vectors.

This section has so far shown the attributes of applying set theory to Hindemith’s pitch collections, particularly quartal. However, Hindemith derived his own system of chord groups in the *Unterweisung* which has several crucial differences when compared with set theory. While both set theory and the *Unterweisung* aim to generalise pitch collections, they do so in different ways. Hindemith acknowledges inversive identity, as does Forte’s set theory – which is why interval classes only cover the unison to the augmented fourth. But this is not reflected in Hindemith’s chord groupings, as shown in the following collection, taken from group A/III.1. This group is defined as chords without a tritone, and containing seconds, sevenths, or both, and derives from the Series 2 hierarchy of chord strength and roots.

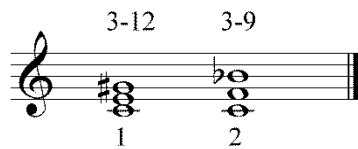
The image shows two staves of musical notation for Hindemith's Chord Group A/III.1. The first staff contains 12 chords, numbered 1 through 12, with set theory labels above them: 3-9, 3-9, 3-7, 3-7, 3-4, 4-22, 4-14, 4-26, 4-19, 4-20, 4-14, and 4-23. The second staff contains 12 chords, numbered 13 through 24, with set theory labels above them: 4-26, 4-19, 4-20, 5-27, 5-27, 4-23, 6-32, 5-23, 3-3, 3-9, 4-26, and 4-20. The notation includes treble clefs, key signatures (one flat and one sharp), and various chord symbols (triads, dyads, and quartets).

Example 3.13: Hindemith’s Chord Group A/III.1. The numbering system and set theory labels are my own.

In Series 1, Hindemith assumes octave equivalence in order to manipulate the overtone series, to create a pitch hierarchy. However, in his chord groups Hindemith stacks intervals

rather than apply the general concept of pitch classes. This occurs on the second line of example 3.13, from chord 16. Not only does this show that Hindemith dealt with a larger range of intervals in his chord classifications than set theory, but also that he included different versions of the same chord, within a single category, such as chords 1 and 22, where the D is transposed up one octave. This shows that interval inversion, and the specific arrangement of intervals within a chord, was important to *Unterweisung* theory. This point is reiterated in the title of the group, ‘chords containing seconds or sevenths or both’, which shows that Hindemith distinguishes between seconds and sevenths. These are considered synonymous in set theoretical terms.

This criterion results in chords of identical pc-sets both within the same group, and between other groups. For example, the quartal set 3-9 is placed by Hindemith in both group A/III.1 and A/V (ex. 3.14). This creates an inconsistency: in group A/III.1 (ex. 3.13), chords 1 and 22 both comprise 3-9. The only difference is the transposition of the D up one octave. And yet the 3-9 trichord is included in group A/V as an ‘indeterminate’ chord (ex. 3.14). If we were to transpose the C of chord 2, group A/V, up one octave, it would be equivalent to chord 2 from group A/III.1. The root position of a chord is an important element of Hindemith’s *Unterweisung*, and one that is not taken into account in a set theoretical analysis.



Example 3.14: Hindemith’s Chord Group A/V, described as ‘indeterminate’. The numbering system and set theory labels are my own.

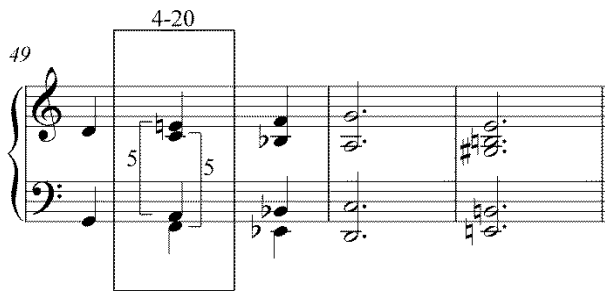
### 3.2 Incomplete Quartal Sets

The definition of a quartal set has so far been taken for granted: that it consists of a series of pitches, which may be arranged into a regular order of ascending fourths or fifths. For example, the prime order of 3-9 [C D G] may be arranged into a pattern of ascending fourths [D G C] or fifths [C G D]. And aside from the grey area between quartal pitch collections and the diatonic scale (particularly concerning cardinality seven collections, 7-35), segmenting Hindemith's music in this way is often straightforward and explicit. However, what happens when a set clearly consists of two superimposed fifths, and yet does not comprise an ordered quartal pitch collection? Take, for example, the set 4-26, which consists in prime form of a combination of [C F] and [E $\flat$  A $\flat$ ] This is nearly a quartal set, but it is missing a B $\flat$  'link' to produce the order of ascending fourths, [C F **B $\flat$**  E $\flat$  A $\flat$ ]. This is a collection used throughout Hindemith's music, as in the following example taken from the beginning of the sixth song of *Lieder nach alten Texten* (1923). The song begins with six instances of the pc-set 4-26, split into two group of fourths [E $\flat$  A $\flat$ ] and [C F]. By virtue of this repetition the pitch collection gathers salience.

The musical score shows six vocal parts. Soprano I has a rest followed by a melodic line. Soprano II, Alto, and Bass have a rhythmic accompaniment of eighth notes. Tenor and Baritone have a melodic line. The lyrics are: 'Tum-mel dich, tum-mel dich, guts Wein-lein. Tum-mel dich, guts Wein-lein. Frisch auf, gut Gsell, laß'. A box labeled '4-26' highlights the first two measures of the Soprano II part.

Example 3.15: *Lieder nach alten Texten* (1923), No. 6, 'Landsknechtstrinklied', bb. 1-5.

The list of incomplete quartal sets may also be expanded to cover collections with more than one ‘missing link’, such as the second chord of bar 49 in the *First Piano Sonata*. This comprises two fifths [F C] and [A E]. This is missing two pitches, D and G, required to create an ordered quartal collection. In this way, we can describe this set as containing two **degrees of incompleteness**. Further degrees of incompleteness may be achieved by removing more fourth or fifth chains from an ordered quartal collection. Notable in this example is the tendency for Hindemith to move towards fewer degrees of incompleteness over time, indicating that Hindemith’s concept of harmonic fluctuation is also paralleled by the degree of completeness in a quartal collection.

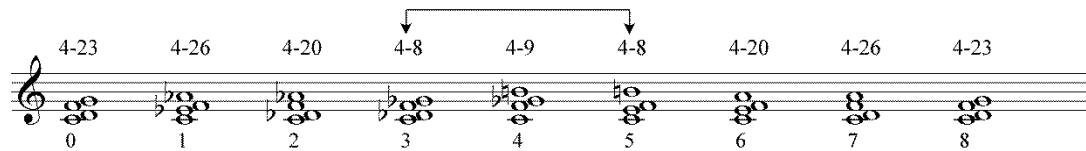


Example 3.16: *First Piano Sonata*, first movement, bb. 49-51.

Example 3.17 illustrates each degree of incompleteness for the quartal tetrachord. As the chords move to the right of the diagram, the distance, in fourth intervals, between the initial fourth interval [C F] and the next fourth interval becomes greater. There is, however, a mid-point in the sequence where the pitch collections repeat, in retrograde. Thus the maximum degree of incompleteness for the quartal tetrachord is four (4-9).

Incomplete quartal tetrachords may also be found within Hindemith’s chord groups. The tendency of a quartal tetrachord towards a maximum degree of incompleteness corresponds with these groups, as the most incomplete quartal tetrachords (4-8 and 4-9) are the only quartal tetrachords included in Hindemith’s section B groups (chords with tritone). As

Hindemith's chord group B is to be understood as the least stable, incomplete quartal collections are also unstable, according to *Unterweisung* theory.



Prime form -----

Example 3.17: incomplete quartal tetrachords.

The following table lists permutations of incomplete quartal collections. The further to the right of the table a set is found, the less plausible it is that a set is based in quartal harmony. The bold asterisks show the point of highest incompleteness for each cardinality: for even cardinalities this occurs once, for odd cardinalities this occurs twice.

Degree of Incompleteness	0	1	2	3	4	5	6	7	8
	4-23	4-26	4-20	4-8	4-9	<b>*4-8</b>	4-20	4-26	4-23
	5-35	5-27	5-20	<b>*5-7</b>	<b>*5-7</b>	5-20	5-27	5-35	
	6-32	6-z25	6-18	<b>*6-z6</b>	6-18	6-z25	6-32		
	7-35	7-29	<b>*7-20</b>	<b>*7-20</b>	7-29	7-35			
	8-23	8-6	<b>*8-9</b>	8-6	8-23				
	9-9	<b>*9-5</b>	<b>*9-5</b>	9-9					

Table 3.4: incomplete quartal pitch collections. Bold asterisks mark the maximum degree of incompleteness for each cardinality.

There are other incomplete quartal chords not covered by this method. These include 3-7 [C D G], 4-22 [C D E G] and 6-33 [C D E $\flat$  F G A]. 3-7 is found in *Six Chansons*, no. 1 bar 4, 4-22 is found in the fourth bar of *Six Chansons* (ex. 3.18) and the opening motif of the *Messe* (ex. 3.19). With sets of cardinalities greater than four, it is also possible to keep three pitches the same before breaking the chain of fourths, to produce further incomplete quartal collections. The table provided here is thus not exhaustive.

4-22 4-22 4-22

yeux a - bon - de; com-  
yeux a - bon - de; com-  
yeux a - bon - de; com-  
yeux a - bon - de; com-

*p*

Example 3.18: *Six Chansons*, no. 1, b. 4, two 4-22 incomplete quartal tetrachords. The first is ‘missing’ an F $\sharp$ , the second is ‘missing’ an A.

6-33

Ky - ri - e e - le - i - son, \_\_\_

Example 3.19: *Messe*, bar 1, 6-33 incomplete quartal hexachord. It is ‘missing’ a G.

Incomplete quartal sets open up further interpretative possibilities. Taken in isolation, 4-26 may be understood as bitonal, if the two sets of fifths are viewed within their own diatonic triads. As this works with superimposed fourth/fifth dyads, polytonal, incomplete quartal sets may only occur with even cardinalities. They must therefore comprise pc-sets 4-26 (which in prime form can imply the keys of F and A $\flat$ ), and 6-z25 (which in prime form can imply the keys of F, A $\flat$  and G $\flat$ ). To convincingly define an area of bitonality, however, the analysis of a linear passage of music also is necessary.

### 3.3 Post-Tonal Voice Leading

Much of Hindemith’s music is contrapuntal: meaning that it is based on principles of voice leading, where individual parts follow linear progressions. A voice-leading analysis can show how Hindemith’s harmonic space, which is often characterised by quartal collections, is also

governed by contrapuntal progressions, and can help to determine pitch class salience, and therefore determine the difference between the diatonic, chromatic, modal and quartal facets of Hindemith's pluralistic harmony. However, these need to be adapted to take into account the differences between diatonic harmony, for which voice-leading reduction was originally developed, and post-tonal harmony. A similar approach has been taken by Neumeier (1986), where he introduces a number of symbols to denote pitch hierarchy, taking heed of those introduced in the posthumously published *Unterweisung III*.

Set theory enabled a study of collections of pitches, whereas voice-leading reduction is necessary to ascertain hierarchies, particularly the identification of Hindemith's single, governing pitch or 'tonic'. Hindemith's pitch centre (*Zentralton*) is defined clearly in *Unterweisung III*:

The [*Zentralton*] is the point of rest in each series of relationships. So long as it is not replaced by a new [*Zentralton*], it stands in the middle of the relationship tensions as the basis and tonal centre. It is itself immovable; although it performs the most important tonal function, it is tonally inactive. Without a tonal centre, a tonic, no systematically constructed harmonic music is conceivable.<sup>108</sup>

As Hindemith's *Zentralton* differs from traditional triadic harmony, a diatonic, Schenkerian voice-leading reduction needs to be adjusted.<sup>109</sup> This is predominately the result of assuming that a pitch centre may be expanded, usually on a background structural level, as a full diatonic triad. Diatonic triads exist within Hindemith's music, although care needs to be taken when negotiating between a diatonic and quartal collection, as was the case in my set theoretical discussion. The solution, as before, lies in which elements are most salient. In many instances, the quartal collections are prolonged, and therefore considered structurally

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<sup>108</sup> *Unterweisung III* (1970) p. 86. The translation used here was made by one of Hindemith's students, and is held in the Yale Hindemith Collection.

<sup>109</sup> The term 'Tonal Centre' is used in the *Craft*, in the section on Harmonic Degree Progression. This comes from the German '*Zentralton*', which does not actually infer 'tonality' but simply 'tone'. Therefore, 'pitch centre' is a more suitable translation.

consonant. This approach applies Straus's 1987 atonal prolongational model, combined with Lerdahl's salience characteristics. Straus summarises atonal prolongation in the following way:

Given three musical events X, Y and Z [...] the prolongational model claims "Y is structurally inferior to X and extends X; X is not displaced until Z arrives."<sup>110</sup>

The concepts of voice leading reduction and prolongation are also implicit in *Unterweisung I* and *Craft II*. These are included as Hindemith's melodic and harmonic degree-progressions and tonality levels of the *Unterweisung I* graphic analyses, and the term 'Tonal Higher-Units' used in *Craft II*. Hindemith frequently uses the metaphor of family groups to define prolongation, which unfortunately often confuses this aspect with his derivation of Series 1, which similarly makes use of the metaphor of family groups, despite meaning a differently ordered system. The following is taken from *Craft II*:

In the domain of intervals the family relationship of people is paralleled by the tonal relationship to a common tonal centre. This is the source-tone, the father, around which the intervals group themselves like a much-branched family of children, grandchildren, and great-grandchildren.<sup>111</sup>

While Hindemith does not recognise this feature outright in the *Unterweisung*, it is implicit that harmony based on fourths and fifths in a composition carries the greatest structural weight; or gravity, to use another of Hindemith's metaphors. This is due to the prominence of the fourth and fifth in both Series 1 and Series 2, and in Hindemith's chord group classifications. Consequentially, quartal pitch collections may be subject to prolongation in *Unterweisung* theory, as found in the following example.

There have been few voice leading studies of Hindemith's music, relative to studies of other twentieth-century composers such as Bartók and Schoenberg.<sup>112</sup> Salzer (1952) provides

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<sup>110</sup> Straus, Joseph, 'The Problem of Prolongation in Post-Tonal Music' *Journal of Music Theory* Vol. 31, No. 1 (Spring, 1987) p. 2.

<sup>111</sup> *Craft II*, p. 90.

graphic analyses of the first movements to each of the three *Piano Sonatas*, and the Interludium in G from the *Ludus Tonalis*. Morgan, too, provides a graphic analysis of the Interludium in G from the *Ludus*, as does Neumeyer (1986).<sup>113</sup> That this single Interludium has attracted attention from three scholars, in an environment where there is little other graphic voice leading reduction of Hindemith's music, highlights that it offers a rare and controversial problem to voice leading analysis. This involves the concept of verticalization, whereby the linear elements of a compound melody are placed atop of one another, to provide a chord or harmonic group. All three studies reduce the first bar to a G minor triad. While this makes for a convenient realisation of the opening harmony, which permits a prolongation over the complete Interludium, it fails to reflect Hindemith's quartal harmonic language. The opening pitch centre is unmistakably G. However, this does not necessarily imply that it is associated with a major or minor triad. The opening is far closer to one of Hindemith's quartal collections than to the G minor triad, particularly given the absence of a sharpened leading note. The right hand comprises pc-set 5-35, which combined with the left hand comprises pc-set 7-35. This is equivalent to both a heptatonic quartal pitch space, and the major scale of F major: neither of which are the G minor triad.

Example 3.20: *Ludus Tonalis*, Interludium in G, bb. 1-2.

<sup>112</sup> See, for example: Väisälä, Olli, 'Concepts of Harmony and Prolongation in Schoenberg's Op. 19/2' *Music Theory Spectrum* Vol. 21, No. 2 (Autumn, 1999) pp. 230-259; Morrison, Charles D., 'Prolongation in the Final Movement of Bartók's String Quartet No. 4' *Music Theory Spectrum*, Vol. 13, No. 2 (Autumn, 1991) pp. 179-196; and Wilson, Paul, 'Concepts of Prolongation and Bartók's Opus 20' *Music Theory Spectrum*, Vol. 6, (Spring, 1984) pp. 79-89.

<sup>113</sup> There are many other graphic analyses of Hindemith's music throughout Neumeyer, David, *The Music of Paul Hindemith* (Yale University Press, 1986).

With a quartal harmonic structure in place, my voice leading reduction of this passage emphasises the salience of the first beat of bar one, the pitch centre of G, and of beat two, a D. Within a quartal pitch space, adding a B $\flat$  to complete a triad is no more justified than adding a different pitch of the two 5-35/ 7-35 sets. Indeed, given the presence of C in the right hand, a voice leading reduction that is faithful to the quartal pitch space would need to include [D, F, G], which comprises pc-set 3-9. This relates to the opening phrase in the following way:

Example 3.21: revised voice leading reduction of Interludium 2 from the *Ludus Tonalis*, bb. 1-4.

The B $\flat$  in the left hand of the piano, which previous studies have used to complete a G minor triad, is here treated as foreground only. The background of the first bar thus comprises pc-set 3-9, the primary quartal trichord. Seen in this way, a voice leading reduction of this passage shows a succession of prolonged quartal collections, with an ascending pattern of fifths in the left hand. This shows how the harmony of this passage is characterised by the quartal, *Unterweisung* style. Furthermore, Hindemith writes contrary

motion between the background of the two staves, a two-voice framework strongly advocated in *Craft II*.<sup>114</sup>

This Interludium is also noteworthy as, unlike the other works from the *Ludus*, it contains harmonic closure; the remaining Interludiums from the *Ludus* cycle are used to modulate from the pitch centre of one fugue to the next. With the exception of these other Interludiums from the *Ludus* cycle, Hindemith's music often starts and ends with the same pitch centre. His *Unterweisung* concept of tonality, or tonal higher units, is therefore preserved, meaning that his music often lends itself well to a complete Schenkerian reduction. Indeed, it is usually possible to create an Urlinie in his music, as Hindemith himself would have us believe in his correspondence with Schenker. This involved a small exchange of letters, which began with Schenker's criticism of Hindemith in *Das Meisterwerk der Musik* (1925). Schenker's outburst clearly affected Hindemith, which is unsurprising given the commonalities between their music theories, provoking him to send Schenker a copy of two of his string quartets. Hindemith hoped that Schenker would find a satisfactory Urlinie within them:

With this letter I enclose the scores of two of my quartets; if, after overcoming your preliminary and subsequent uneasiness, you examine them as I hope you will with the same care and thoroughness you would give to a Scarlatti sonata, I am convinced that you will find in this music your "Urlinie" and, together with it, musical reason and logic and confirmation of your teachings.<sup>115</sup>

This correspondence showed that Hindemith believed himself to be sympathetic with many of Schenker's theories. However, in this letter Hindemith cites only Schenker's Urlinie and not his Ursatz: perhaps for one of two reasons. The first, that Hindemith was not aware of the distinction between these two crucial Schenker terms. The second could be that

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<sup>114</sup> There are several references that promote contrary motion in *Craft II*, such as rule 22, p. 26.

<sup>115</sup> Skelton, Geoffrey, *Selected Letters of Paul Hindemith* (New Haven: Yale University Press, 1995) pp. 45-6. Hindemith's letter to Schenker is dated 25 October, 1926.

Hindemith wished to concentrate on a descending contrapuntal progression that was not accompanied by the Bass Brechung; in other words, his music had contrapuntal edifice that was not governed exclusively by diatonic tonality.

With this in mind, voice-leading reductions of Hindemith are useful for showing the closure of a pitch centre; sequential patterns; and salient features that may be observed at a background structural level. This data may then be used to ascertain the extent to which Hindemith's *Unterweisung* theory is present in his compositional practice. While voice-leading reductions may coincidentally include a pattern resembling an Urlinie, there is unlikely to be a faithful Ursatz in his music. In this sense, the following voice-leading reductions in this thesis are Schenkerian, rather than faithfully Schenker. It should also be noted that, despite his intention to revise many aspects of his *Unterweisung* series, Hindemith was not preparing to revise his understanding of prolongation, as is clear from the following passage in *Polluted Waters* (1963). This strengthens the notation that prolongation was an essential consideration within his music theory:

Although it is commendable to facilitate the listener's understanding of music by such [diatonic areas within the chromatic framework of *Tristan*] supports, one does not need (to use an architectural analogy) to lean on a pillar every two steps he takes. It is sufficient to use these main supports sparsely and to put less important material in between – naturally, without letting the listener stifle in embellishment or drown in inarticulation.<sup>116</sup>

The following example shows how basic voice-leading concepts are necessary to an accurate set-theoretical segmentation of the opening motif from Hindemith's *Messe* (1963), which provides a slightly different interpretation to the incomplete 6-33 hexachord in example 3.19. The full motif begins in the soprano part, and is succeeded by imitative polyphony in the three lower voices. The passage is formed from a quintessentially Hindemithian arrangement

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<sup>116</sup> *Polluted Waters* (Sterbende Gewässer) p. 13. As inscribed in the Yale Hindemith Collection, this address was given on 28 June 1963, at a chapter meeting of the Order 'Pour le Merite' for the arts and sciences in Bonn, Germany. Hindemith died exactly six months later.

of fourths and fifths, which comprise pc-set 6-33. This could be described as a type of incomplete quartal set, which is missing a G to complete an ordered 7-32 collection. More representative of the musical surface, however, is to evaluate the C in bar two as a passing note. While a simple case, this shows the quartal collection 5-35 featuring at a slightly deeper level of structure.

6-33

Ky - ri - e e - le - i- son, \_\_\_

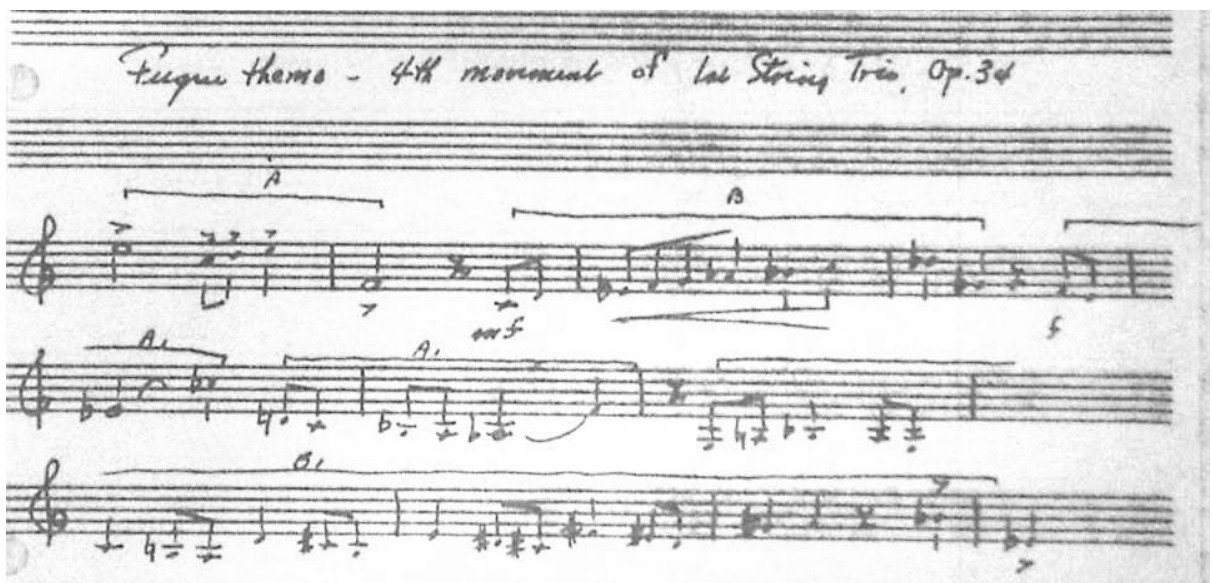
Example 3.22: Hindemith's *Messe*, 'Kyrie', opening soprano motif.

### 3.4 Methodological Conclusions

Set theory and voice-leading reductions are crucial tools towards an analysis of Hindemith's music, and subsequently an evaluation of the presence of his theory within it. They point to inconsistencies within the *Unterweisung*, such as his chord groups, while also providing a generalising analytical approach. This can succinctly identify the difference between, for example, octatonic and quartal pitch collections, and draw attention to salient pitch grouping via voice-leading analysis, in addition to identifying and describing quartal pitch cycles. It is also the combination of set theory and voice leading analysis that differentiates between the diatonic collection 7-35, and its quartal arrangement: in other words, to qualify a pitch collection as 'quartal' ultimately depends not just on the pitches, but how they are used in counterpoint.

Hindemith's music is goal orientated; it moves to and from hierarchically related pitch areas. A voice leading reduction serves to highlight these goals, in order to permit further analysis,

such as Series 1 and 2 ‘distances’ and two-voice framework. Care must be taken, however, to avoid elaborating a pitch centre into a complete triad, unless the pitch space is explicitly diatonic. Apart from the reductive analyses in the *Unterweisung*, there is further evidence for Hindemith’s approach to motivic analysis in the following fragment in the Yale Hindemith Collection. While it does not carry a signature, it strongly resembles Hindemith’s handwriting. It shows that the fugue theme, to the fourth movement of his *String Trio* op. 32, segmented into motifs A and B. These are then subject to developments, identified as A<sub>1</sub> and B<sub>1</sub>: a process strongly reminiscent of Schoenberg’s motivic analysis from *Fundamentals of Musical Composition* (1967).



Example 3.23: Hindemith’s segmentation (presumably, by his handwriting) of the fugue theme from the fourth movement of his String Trio, op. 32. Yale Hindemith Collection, Box 1, Folder 53.

In summary, the method presented in this chapter uses the following procedure:

1. Identify salient features, such as metrical position, groupings of bar lines and musical phrases, motif, dynamic, rhythmic duration, timbral prominence and registral position
2. Use these to group pitch collections
3. Identify atonal prolongations between salient pitches, or collections of pitches
4. Reduce the music to a background structural level

The results from this process permit a close discussion of the presence of *Unterweisung* principles in Hindemith's music.

### 3.5 Working Example

The following analysis of the theme from the third movement of Hindemith's *Sonata for Four Horns* (1952) demonstrates this method, and identifies its analytical challenges. The basis of the theme is taken from an old German folksong, 'Ich schell' mein Horn in Jammers Ton', which was first put to music in a motet by Ludwig Senfl (c. 1490-1543), before put to further use in compositions by Johannes Brahms<sup>117</sup> It is likely that Hindemith's came to know the work through Senfl's motet. The method proceeds as follows:

**Step 1:** for ease of analysis, the theme of the first movement is provided in example 3.24 as a piano reduction transposed to concert pitch. All notes are referred to in concert pitch.

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<sup>117</sup> Senfl's motet has been a source for two songs from Brahms, Op. 41 & 43. The original text is by Herzog Ulrich (1510), and was published in *Das Ambraser Liederbuch vom Jahre 1582*.

Getragen Tenuto (♩ = 80)

6 **A**

10 *riten.* *a tempo*

13

Example 3.24: Hindemith's *Sonata for Four Horns*, third movement, Theme on 'Ich Schell mein Horn'.

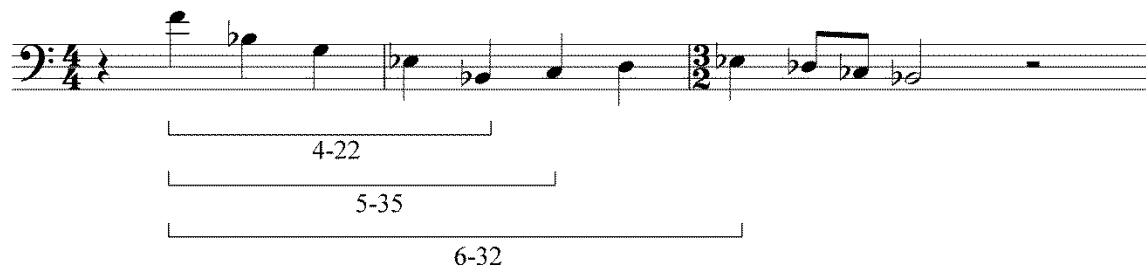
The motet has a small compass due to the use of a single instrument type. As a result, many pitches are subjected to repetition. However, F receives by far the greatest emphasis as the starting note, root of the final chord, and common presence at the beginning and end of phrase structures. This defines it as the pitch centre.

As the instruments are identical, timbral prominence is not relevant (unlike, for example, Hindemith's *Kammermusik*, where timbral characteristics help to determine salience). However, the registral positioning indicates an emphasis in the highest register B $\flat$  and C in

Horn 1, and similarly, B $\flat$  and C in the lowest register of Horn 4. Combined with the pitch centre, this framework creates the quartal trichord 3-9 [C F B $\flat$ ].

**Step 2:** the grouping of pitch collections in this theme is generally straightforward given the four-part texture. Many lines emphasise quartal collections, such as the first phrase in Horn 4, encompassing [B $\flat$  F C]. This is determined by the phrase grouping, which begins on B $\flat$  and ends on C, and the metric salience of the F on the second minim of bar two.

The second phrase in Horn 4 is particularly quartal in the context of the theme. It may be segmented into at least three different quartal collections, such as 4-22 (incomplete), 5-35 and 6-32. It is not diatonic, given the use of the fifth and fourth intervals between pitches.



Example 3.25: Hindemith's *Sonata for Four Horns*, third movement, bb. 4-6, Horn 4, pitch groupings.

**Step 3:** Quartal pitch collections may be prolonged in Hindemith's music. The segmentation of these collections is determined by structural salience characteristics. Passing and neighbour notes define middleground prolongations. One issue presented between steps two and three is the classification of passing note figures during quartal prolongations. From the fourth to the fifth crotchet in bar three, the tie implies a suspension in diatonic harmony. In this context, the subsequent B $\flat$  is classed as a passing note, as it moves off the tie, and towards the next metric beat. The A $\flat$  on the second crotchet of bar seven represents a

similar case, although lasts for a full crotchet beat. Perhaps problematically, both passing notes form consonant minor triads (G minor and F minor respectively). The salience of the metric positioning and phrase structure defines these pitches as passing notes, which are diatonically consonant.

The image displays two musical systems. Each system features a grand staff with a treble clef on top and a bass clef on the bottom. Below each grand staff is a reduction staff. In the first system, the bass clef staff has a note marked with 'P' and an upward-pointing arrow. The reduction staff below it shows three intervals: 4-23, 3-9, and 3-9. The second system has a note marked with 'P?' and an upward-pointing arrow in the bass clef staff. Its reduction staff shows three intervals: 3-9, 3-9, and 3-9.

Example 3.26: Hindemith's *Sonata for Four Horns*, third movement, bb. 3 & 7, pitch groupings prior to voice-leading interpretation.

The consecutive sevenths in bar 13-14 present a further issue to pitch grouping. While comprising parallel diads, their relationship to surrounding melodic material implies two quartal trichords. In bar 13, the salience of F as the beginning of a phrase in Horn 1 creates an attachment to the subsequent [C B $\flat$ ] interval. In the reverse direction, the [B A] interval at the beginning of bar 14 connects with the E on crotchet beat two. This reading is related to the Schenkerian concept of compound melody, and offers an explanation as to why these parallel sevenths may be found to sound particularly 'Hindemithian'.<sup>118</sup> Moreover, it outlines a linear quartal pattern, shown in example 3.27. This similarly occurs at bar 10, third minim beat.

<sup>118</sup> See Forte, Allen & Gilbert, Steven E., *Introduction to Schenkerian Analysis* (W. W. Norton & Co., 1982) chapter 3, 'Compound Melody' pp. 67-82.

Example 3.27: Hindemith's *Sonata for Four Horns*, third movement, bb. 13-14.

The neighbour notes in Horn 3 from bars two to three create a similar situation. The upbeat to bar three is grouped within the quartal tetrachord 4-23, and is prolonged. This is determined by the salience of its position at the beginning of a phrase, and its presence within a number of repeated B $\flat$  pitches in other parts; bars one to three repeat B $\flat$  eight times, which is half of the total number of crotchet beats.

The B $\flat$  could be included within the pitch collection at the beginning of bar three, to create 5-35. However, at this point it is neither given salience by phrase boundaries, nor metric position. Moreover, it creates an imaginary fifth part in the quartal collection. This understanding would treat the neighbour note figure as a compound melody in the Horn 3 part, which is unreasonable as it moves solely in stepwise motion.

Example 3.28: Hindemith's *Sonata for Four Horns*, third movement, bb. 1-3.

**Step 4:** these results may be expressed in the following voice leading reduction, with accompanying pitch collections. It highlights Hindemith's preference for contrary motion between parts, unless they form a quartal pattern. It further shows a tonal flattening from bars 8-10, from F towards A $\flat$  and D $\flat$ . Bar 10 is also the only area to include the tritone interval, save a single passing note in the final cadence at bar 15. This shows a structural plan for harmonic tension and fluctuation. In the Series 1 order, transposed to F, the furthest pitch is B. This is only referred to twice in the theme: a passing note in the cadence at bar 6, and in the final cadence in bar 15.

This process may then be carried out on Hindemith's subsequent variations within this movement to show his manipulative procedures, and to illustrate the presence of Hindemith's *Unterweisung* principles within his compositional practice.

4-23 3-9 3-9

6

3-9 4-23

10

3-9

13

3-9 3-9

Example 3.29: Hindemith's *Sonata for Four Horns*, third movement, reduction. The reduction is transposed up one octave.

## Chapter 4 Coherent Pitch Collections and Compositional Strategies in Hindemith's pre-*Unterweisung* Music

This chapter analyses in close detail a cross-section of Hindemith's early music in order to demonstrate the presence of two pitch strategies. The first relates to Hindemith's use of pitch collections based on combinations of fourths and fifths, such as pc-sets 3-9, 4-23 and 5-35. This stems from Hindemith's expert familiarity with string instruments, as the open strings on a violin, viola, 'cello or double bass all form pc-set 4-23. This was to be subsequently formalised in the *Unterweisung* as Series 1 and 2, which created a hierarchical basis for chord roots, chord formation and an analytical method. The second strategy relates to pc-sets with higher cardinal values, such as the octatonic scale, which provide a more general sense of chromaticism. This dual practice is evident in Hindemith's early music, while after the *Unterweisung* he shows a clear preference for the first strategy, based on ascending fifths, at the expense of octatonic collections. These two strategies cannot coexist, as it is impossible to create pc-set 4-23 within the octatonic scale, 8-28.

The early music covered in this chapter, written between 1919 and 1922, self-consciously swings from seriousness to the grotesque, borrowing from styles such as expressionism, impressionism and jazz; baroque and classical forms; and dances such as shimmies and foxtrots. Perhaps as a result of this pluralism, it has proven to be exceptionally hard to analyse. This is also a consequence of the complexity of some of his music, particularly in terms of pitch structure, and the formidable wealth of motivic material. And yet, an analytical understanding of this music is required to discriminate between those elements of Hindemith's style that were jettisoned after the *Unterweisung*, including the octatonic scale, and those that remained consistent, such as the use of pc-sets 3-9, 4-23 and 5-35. An analysis

also provides a musical backdrop against which Hindemith first began formulating his theory of music. In order to explore the changing relationship between Hindemith's music and his music theory, I have subdivided his musical compositions into three categories: those written before the *Unterweisung*, those written immediately after which are described as particularly strong examples of his theory, and those written before but subsequently revised after the *Unterweisung* was published. This chapter therefore examines music from the first category.

Hindemith's interest in music theory was not always evident, as is made clear from his attitude in his short autobiography which accompanied his music in the second Donaueschingen music festival in 1922, which forms a stark contrast with his views later in life:

I cannot give analyses of my new works because I don't know how to explain a piece of music in a few words (I would rather write a new one in the time). Besides I think that for people with ears my things are perfectly easy to understand, so an analysis is superfluous. For people without ears such cribs can't help. Neither do I write out single themes, which always give a false impression.<sup>119</sup>

A study of compositions from this early period, therefore, must be conducted with the understanding that Hindemith was eager to include influences from the music around him, without readily engaging with the theoretical and analytical implications associated with these borrowings. This forms a stark contrast with Hindemith later in life, who became the epitome of a cerebral, theoretically-based composer.

I focus my examination of this period on Hindemith's string music, notably the solo works and string quartets, given the relationship of these pieces to his activities as an internationally recognised performer. The majority of Hindemith's solo string works were written before Hindemith's appointment to the Berlin Hochschule für Musik in 1927, which perhaps

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<sup>119</sup> Kemp, Ian, *Hindemith* (London: Oxford University Press, 1970) p. 1.

indicates an impetus to move away from this genre as he approached stylistic maturity and consistency. I also discuss sections from the *Suite 1922*, which typifies Hindemith's pluralism and stylistic borrowings.

This music was written just before the period of Hindemith's music that has been associated with Germany's then prevalent 'Neue Sachlichkeit' (New Objectivity). This artistic trend is defined by Ernst Krenek as the 'emphasis on perfect construction rather than exuding sentiment (therefore, anti-Romantic). It exists in that no-man's land between serious music and entertainment music.'<sup>120</sup> Schubert, in his discussion of Hindemith and Neue Sachlichkeit, associates an affinity for the movement in works such as the *Kammermusiken 2-7* (1924-7), *Concerto for Orchestra* op. 38 (1925), *Das Marienleben* op. 27 (first version, 1922-3) and *Cardillac* op. 39 (1925-6).<sup>121</sup> While he does not offer a year for the beginning of Hindemith's connection with the Neue Sachlichkeit, it is implied that it began from approximately 1924, with the only earlier exception being *Das Marienleben*, before reaching its apotheosis with *Cardillac* in 1925-6. An analysis of Hindemith's pre-Neue Sachlichkeit work is significant, as it generally demonstrates the most eclectic compositional processes.

One aim in my analysis of this music is to move away from the rather unhelpful characterisation of this music as 'chromatic'. Remarks such as 'the employment of a flexible tonal musical language involving a high degree of chromaticism' by Whittall (1999) are typical of this generalisation, whereas the reality is much more complex.<sup>122</sup> This chapter

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<sup>120</sup> Krenek, Ernst, *Horizons Circled: Reflections on my Music* (Berkeley: University of California Press, 1974) p. 24.

<sup>121</sup> Schubert, Giselher, 'Paul Hindemith' *New Grove Online*, accessed 16 April 2013.

<sup>122</sup> Whittall, Arnold, *Musical Composition in the Twentieth Century* (Oxford University Press, 1999) p. 139. Such a generalisation is, however, excusable given the broad range of material Whittall covers in this seminal text, and I do not wish to downplay the significant achievements of his work.

begins by investigating the compositional influences on the young Hindemith, including both a comparison of similarities between selected compositions by contemporary composers and an examination of the music to which Hindemith was exposed, particularly as a performer with the Rebner and Amar Quartets. I then discuss the general issues connected with the understanding of Hindemith's string music from his early period, followed by a more in-depth analysis of the *Solo Viola Sonata* op. 25/1, and the counterpoint in the *String Quartet* op. 22.<sup>123</sup>

#### **4.1 The Contexts of Hindemith's Early Pluralist Style**

No musical composition exists entirely as the product of self expression, without a trace of external influence. Every composer will have experienced the music of others, and artistic influences may arrive by a number of means. These include the general dissemination of music through publishing, music heard in performance, be it live or recorded, and music which the composer performs himself. It is insightful to suggest the influences upon Hindemith through this final category, particularly given that he was an exceptionally busy, professional player of the violin, and subsequently the viola.

In 1923 Adolf Weismann questioned the relationship of Hindemith's compositions to the music he was performing when he wrote 'Is not Hindemith the viola player, and member of the Amar Quartet, all too ready to adopt the methods of the composers performed by himself?'<sup>124</sup> It is now possible to trace these influences more directly, which shows that Hindemith, above many composers of the time, had a particularly eclectic exposure to music as a performer. It also shows that many of the pitch collections associated with Hindemith's

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<sup>123</sup> I am not counting music for harp and piano in this category, while technically members of the string family.

<sup>124</sup> Weismann, Adolf, 'Notes from Abroad' *Musical Times* Vol. 64 No. 970 (December, 1923) p. 872.

early music, such as the octatonic scale, may be found in the music he knew through performance.

Hindemith began his performing career on the violin, joining the first violins of the Frankfurt Opera Orchestra in 1914, before being promoted to leader in 1917.<sup>125</sup> As a chamber musician, he joined the Rebner Quartet as second violin to Adolph Rebner, his teacher in the Frankfurt Hoch Conservatory, before permanently switching to the viola after returning from a short spell of military service in 1918. Following the refusal of Gustav Havemann to perform his *String Quartet* op. 16 in the Donaueschingen Music Festival of 1921, Hindemith founded the Amar String Quartet. This quartet specialised in the performance of contemporary music, and gave numerous premieres by leading composers in Germany at the time alongside canonical works by Mozart, Beethoven and Brahms.

In the three issues of the *Hindemith Jahrbuch* from 1991-1993, Michael Kube has provided a complete list of performance activities involving Hindemith and the Rebner and Amar String Quartets. This demonstrates Hindemith's fondness for op. 25/1, as he included the work in 23 separate concerts in which either the Rebner or Amar Quartets were involved. Hindemith's other unaccompanied string works were chosen notably fewer times, including the *Sonata for Solo Viola* op. 11/5(1919) once, the *Sonata for Solo Viola* op. 31/4 (1923) twice and the *Sonata for Solo 'Cello* op. 25/3 (1923) four times.<sup>126</sup> The solo sonata was often programmed between two string quartet works, thus providing a contrasting programme. It was also not unusual for the concert to be of works entirely by Hindemith, although there

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<sup>125</sup> Schubert, Giselher, 'Paul Hindemith' *Grove Online* (accessed 10 September 2011).

<sup>126</sup> Kube, Michael, 'Am Quartett pult. Paul Hindemith im Rebner- und Amar-Quartett: Dokumentation (3. Teil)' *HJb* Vol. 22 (Mainz: Schott & Co., 1993) p. 210.

are plenty of examples that show the versatility and diversity of programming of other composers by the ensemble.<sup>127</sup>

There is much to be learned about Hindemith's compositional process from the works he performed with his quartet around the time that he was writing. For example, it is clear that the ensemble enjoyed frequent performances of the first two quartets by Bartók. The first quartet op. 7 was performed on 22 occasions, beginning on 17 February 1919, while the second quartet op. 17 was performed 13 times beginning on 28 October 1920. The Amar Quartet also made the first audio recording of Bartók's second quartet – the first ever of any work by Bartók.<sup>128</sup> This was not to the neglect of older music, however – in fact, performances of Mozart, Beethoven and Brahms were at least as common. Hindemith's own compositions received by far the most performances. What this meant was that Hindemith, owing to his intensive activity as a chamber performer, was exposed to an enormously eclectic range of repertoire in his twenties. His employment as violinist in the Frankfurt Opera Orchestra between 1914 and 1923 included the premieres of operas by Schreker and Bartók in addition to the performances of many of the leading composers of the time.<sup>129</sup> There can be little doubt that a performing knowledge of this music contributed to the development of his compositional style. Below are three examples of concert programmes demonstrating the inclusion of op. 25/1:

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<sup>127</sup> Refer to volumes 20-22 in the Hindemith Jahrbuch for a complete list of these programmes (1991-3). The third volume also digests this information to list each work performed in an index. This work updates Neumeyer, David, & Schubert, Giselher, 'Arnold Schoenberg and Paul Hindemith' *Journal of the Arnold Schonberg Institute* Vol. 13, No. 1 (June, 1990) pp. 3-46, particularly p. 5, as will be discussed below.

<sup>128</sup> This recording is discussed in Breuer, János, 'Die erste Bartók-Schallplatte. Das II. Streichquartett op. 17 in der Einspielung des Amar-Hindemiths-Quartetts' *Hjb* Vol. 5 (Mainz: Schott & Co., 1976) pp. 123-45.

<sup>129</sup> The Frankfurt premieres included: Schreker, *Die Gezeichneten* (25 April 1918), *Der Schatzgräber* (21 January 1920) and Bartók, *Bluebeard's Castle* and *The Wooden Prince* (13 May 1922).

No. 307: 6 May 1923, Freiburg (Lecture Hall)

Introductory remarks: Dr. Hermann Erpf

- 1) Hindemith, *Sonata for Solo 'Cello* op. 25/3: world premiere
- 2) Hindemith, *Sonata for Solo Viola* op. 25/1
- 3) Hindemith, *String Quartet* op. 22<sup>130</sup>

No. 328: 17 October 1923, Hamborn

- 1) Dvořák, *String Quartet in F* op. 96
- 2) Hindemith, *Sonata for Solo Viola* op. 25/1
- 3) Smetana, *String Quartet in E Minor* 'Aus meinem Leben'<sup>131</sup>

No. 452: 12 October 1924, Osnabrück (School Council Auditorium)

- 1) Schubert, *String Quartet in E Major* D. 353
- 2) Hindemith, *Sonata for Solo Viola* op. 25/1
- 3) Reger, *String Quartet in F Sharp Minor* op. 121<sup>132</sup>

The following works, in particular, have compositional techniques in common with Hindemith:

Debussy, <i>String Quartet</i> op. 10:	performed 12 times from 27 October 1919
Bartók, <i>String Quartet in A Minor</i> op. 7:	performed 22 times from 17 February 1919
Bartók, <i>String Quartet in A Minor</i> op. 17:	performed 13 times from 28 October 1920
Schoenberg, <i>String Quartet</i> op. 7:	performed 30 times from 23 February 1920
Schoenberg, <i>String Quartet</i> op. 10:	performed 10 times from 28 December 1918
Stravinsky, <i>Concertino for String Quartet</i> :	performed 27 times from 24 September 1924

These works, deliberately chosen from the large repertoires of the Rebner and Amar Quartets, demonstrate that Hindemith regularly performed (and one may assume, rehearsed) music that included octatonic and whole tone collections, combined with the modernist aesthetics of Schoenberg and Stravinsky. The oft-cited and powerful anecdote regarding Hindemith's rehearsal of Debussy's String Quartet is worth noting here in full:

During my time as a soldier in the First World War I was a member of a string quartet which served our commanding officer as a means of escape from the miseries of war. He was a great music-lover and a connoisseur and admirer of French art. It was no wonder, then, that his dearest wish was to hear Debussy's String Quartet. We rehearsed the work and played it to him with much feeling at a private concert. Just after we had finished the slow movement the signals officer burst in and reported in great consternation that the news of Debussy's death [on 25 March 1918] had just come through on the radio. We did not continue our performance. It was as if the spirit had been removed from our playing. But now we felt for the first time how much more music is than just style, technique and an expression of personal feeling. Here music transcended all political barriers, national hatred and the

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<sup>130</sup> Kube, Michael, 'Am Quartettpult. Paul Hindemith im Rebner- und Amar-Quartett: Dokumentation (2. Teil)' *HJb* Vol. 21 (Mainz: Schott & Co., 1992) p. 172.

<sup>131</sup> *Ibid.*, p. 178.

<sup>132</sup> *Ibid.*, p. 200.

horrors of war. Never before or since have I felt so clearly in which direction music must be made to go.<sup>133</sup>

Notwithstanding the use of this text to show Hindemith's involvement with the music of Debussy and his experiences as a performer during the First World War, there is an additional piece of crucial information here which has been overlooked. The date of this performance coincides with the death of Debussy on 25 March 1918: this is over a year before Hindemith performed the same work with the Rebner Quartet. While it is not possible to catalogue fully the works that Hindemith performed in WW1, it is important to acknowledge that, while the documentation of performances with the Rebner and Amar Quartets provides concrete information regarding Hindemith's exposure and performing awareness of key modernist string quartets, it is also possible that he performed many of the works at an earlier date.

Hindemith's early music was therefore intimately connected with the music that he knew as a performer, as demonstrated by his activities as a chamber musician with the Amar and Rebner Quartets. While there is further work to be done, should further information come to light regarding his complete activities as a solo performer, his intensive musical activities at this time justify a comparison of compositional techniques and gestures found in the works of composers such as Bartók, Stravinsky, Debussy, Schoenberg and Webern to his own music. This is particularly the case with regard to Hindemith's eclectic use of pitch collections, ranging from pentatonic to octatonic scales, as a close analysis will now demonstrate.

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<sup>133</sup> Referenced by Skelton, Geoffrey, *Paul Hindemith: the Man behind the Music* (London: Gollancz, 1975) p. 35.

## 4.2 Analysing Early Hindemith

My analyses offer two hermeneutic levels. The first is a study of the music itself. The second places Hindemith within a contemporary context in order to discern how specific stylistic influences may have entered his music, consciously or otherwise. This offers insights into not just what Hindemith's compositional process *may* have been, but it also provides insights into the piece, whether intended by Hindemith or not.

The following demonstrates the pitch and voice leading characteristics of Hindemith's early music, using the salience characteristics introduced in chapter three. As the music was written before Hindemith's development of the *Unterweisung*, it falls into a grey area between tonality and atonality. As in Lerdahl's study of Schoenberg, 'we have in pure form the theorist's nightmare: coherence in the face of no theory'.<sup>134</sup> This coherence, rather than resting on the stability effects of diatonic harmony, or the voice leading logic of chromatic transformations within a tonal network, can be understood with reference to salient compositional elements.

The opening of a sonata fragment that Hindemith composed in 1922 (ex. 4.4) demonstrates a straightforward juxtaposition of two pitch collections, which were prevalent at the turn of the twentieth century: the octatonic and whole tone scales.<sup>135</sup> In the opening six bars, these scales are constructed around the open strings of the violin, namely G, D, A and E. The D in bar one is emphasised by its strong metrical position, dynamic, duration and motivic significance. This is similarly the case with the E in bar 2 and the A in bar 5. The G in bar 3,

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<sup>134</sup> Lerdahl, Fred, 'Atonal Prolongational Structure' *Contemporary Music Review* Vol. 4 (1989) p. 65.

<sup>135</sup> This short work was only recently published as a separate piece from the collected edition in 2008, and is therefore, to many, an unfamiliar composition in Hindemith's output.

as it does not function as a pedal in the same way as the previous two bars, is emphasised by its registral position and its position as the beginning of a rising sequence. Understanding these pitches as salient, the octatonic scale is built from all of the pitches in the bar with the exception of the E $\flat$ . This matches the pedal of the lower D, and its function is to cause a minor ninth dissonance with the lower D.

It is almost impossible to be sure whether Hindemith consciously utilised the octatonic and whole tone scales, or whether it was simply a coincidence of certain pitch combinations. Another interpretation of bars three and four, for example, could be that they are constructed primarily around chains of minor thirds, and that scale patterns are coincidental. However, by placing this work within the context of the music that Hindemith was playing at the time, such as Bartók, Debussy and Stravinsky, where octatonic and whole tone scales are prominent, the presence of these collections becomes more explicit.

Presto (Halbe)

ff

Octatonic Octatonic Whole tones

4

p cresc.

Whole tones Octatonic Octatonic Cadence

Example 4.4: Hindemith, *Solo Violin Sonata Fragment* (1922) bb. 1-6.

I have chosen to begin my discussion of analytical methods with this fragment for two reasons. Firstly, because it was only published in 1993, after many of the major analytical studies of Hindemith's music were written.<sup>136</sup> Secondly, because it presents relatively straightforward analytical issues – the presence of pitch collections and structural hierarchies is, I believe, relatively clear. However, much of the music I will now discuss is significantly more complex, and poses many more analytical challenges.

The opening three bars of the first movement of Hindemith's *Solo Viola Sonata* op. 11/5 (1919), shown in example 4.5, can be understood as a succession of phrases built around different transpositions of the octatonic scale. These are labelled 1-3 in example 4.6. However, while in the previous example a pitch collection was restricted to each bar, and was therefore afforded salience by the natural phrasing caused by Hindemith's bar lines, in this case the spread is more uneven. Furthermore, it is necessary to consider the presence of notes foreign to the octatonic scale, labelled as X and Y, within the phrase. These notes may be understood as lower neighbour notes, in standard voice-leading taxonomy, which relates to the salience of the first and third notes within the figure, resulting from their metrically stronger positions. This indicates that the neighbouring note belongs to a more superficial structural level. This interpretation demonstrates that Hindemith utilises all three transpositions of the octatonic scale in the first phrase.



Example 4.5: Hindemith's *Sonata for Solo Viola* op. 11/5 (1919) bb. 1-3.

<sup>136</sup> Hindemith, Paul, 'Streicherkammermusik II' *Paul Hindemith: Sämtliche Werke* (Schott & Co., 1993). This was also published independently.



Example 4.6: the three transpositions of the octatonic scale (8-28).

It is therefore necessary to discriminate, albeit in a small way in this example, between levels of structure when interpreting these pitch strategies. This has a precedent in Forte's analysis of Debussy's *Prélude à l'après-midi d'un faune*, where he reduces the opening four bars which, while seemingly chromatic on the surface, reveal an underpinning octatonic structure.<sup>137</sup>

Hindemith's reference to the octatonic scale is one which I will be referring to throughout this chapter, not only because it provides a lens through which to understand his compositional logic, but as a way of placing him amongst the music of his contemporaries. For example, op. 11/5 (1919) was preceded by Stravinsky's *Petrushka* in 1910-11 (the famous 'Petrushka Chord' may be traced in the octatonic scale that I have labelled here as number two) and by Bartók's *First String Quartet* op. 7 (1909), which Hindemith performed for the first time on 17 February 1919 with the Rebner Quartet.

In the second phrase of Hindemith's op. 11/5, from bar five to nine, the opening material is repeated in a transposed form. It begins with a quasi-retrograde of the opening two chords, followed by a transposition of the semiquaver motif found in the first bar up an augmented fourth, which keeps it within the third octatonic scale. However, the second chord of bar five, and the second chord of bar six, are no longer octatonic, as shown in example 4.7.

<sup>137</sup> Forte, Allen, 'Debussy and the Octatonic' *Music Analysis* Vol. 10, No. 1/2 (March-July, 1991) pp. 140-141.



Example 4.7: Hindemith's *Sonata for Solo Viola* op. 11/5 (1919) bb. 5-6.

Apart from observing that there are tangible references to the octatonic scale in Hindemith, and that by acknowledging this it becomes possible to discern which pitches are 'foreign' such as passing notes and neighbour notes, there are also many strong references to whole tone collections (pc-set 6-35), such as in the following passage, taken from bars 25-27 of the first movement of op. 11/5:



Example 4.8: Hindemith's *Sonata for Solo Viola* op. 11/5 (1919) bb. 25-27.

I have highlighted, as before, those pitches which lie outside the collection. I believe that this is quite a clear example of a whole tone scale in use, as the notes that are not part of the scale do not occur on rhythmic accents; in the main, they are neighbour notes. These 'discounted' pitches also form a transposition of the whole tone scale. It is surely not coincidental that Hindemith and the Amar quartet performed Debussy's *String Quartet* op. 10 on 27 October 1919, much of which is coloured by whole tone collections. Furthermore, an understanding of structural levels in voice leading is fully integrated in Hindemith's own theory. He describes what is understood by a neighbour note as a *Wechselton* (translated, perhaps rather clumsily, by Mendel in the *Craft* as 'returning tone') and a *Durchgang* (translated as 'passing tone').<sup>138</sup>

<sup>138</sup> *Craft* (1942) pp. 165-167, *Unterweisung* (1940) pp. 196-198.

Apart from octatonic and whole tone scales, Hindemith absorbed pentatonic scales and Scriabin's mystic chord into his compositions from this period, such as his *1922 Suite*. Example 4.9 displays a descending pentatonic scale on the black notes of the piano, and example 4.10 shows a passing, incomplete mystic chord, 5-30 (a subset of 6-34) with the unmistakable characteristics of two fourths in the top half of the sonority. This is preceded by other chords containing fourths, which contribute to a distinctively 'Hindemithian' flavour of fourth chords, which, when stacked together, create quartal collections. The addition of a further fourth to 4-23 creates 5-35: the pentatonic scale.

22

5

5

5

5

5-35, Pentatonic Scale

Example 4.9: Hindemith's *1922 Suite* bb. 22-23, demonstrating the chord 5-35, the pentatonic scale, in this case based on the black notes of the piano.

5-30, subset of 6-34

19

fz

fz

5-30, subset of 6-34

Example 4.10: Hindemith's *1922 Suite* bb. 19-20, demonstrating the passing chord 5-20, a close subset of 6-34, often referred to as Scriabin's 'Mystic Chord'.

### 4.3 *Sonata for Solo Viola op. 25/1 (1922)*

This sonata must be listed amongst Hindemith's favourites of his own compositions for a solo string instrument, and forms the analytical focus of this chapter. It was dedicated to the violist Ladislav Černý (1891-1975), of the Prague String Quartet, and first performed in Cologne on 18 March 1922 by Hindemith himself on the viola.<sup>139</sup> The timeframe within which this work was composed is particularly fascinating: Hindemith began by writing the fourth movement on 7 March 1922, followed by the second and third movements on 9 March. The first and fifth movements were composed on 18 March – the day of the premiere – and were completed on the train journey from Frankfurt to Cologne.<sup>140</sup> That these movements were composed at great speed shows that Hindemith was working intuitively, rather as a result of long term planning, as will become evident below.

Op. 25/1, as one of Hindemith's favourite pieces, is therefore an ideal subject for an analysis of his early style. However, it presents a daunting task. The compositional process is complex in almost every way: pitch collections, proportional design, motivic relationships and rhythm. Through a detailed analysis I demonstrate, and define, elements of Hindemith's compositional logic and strategies, in order to show the presence of coherent pitch collections. This includes identifying the presence of notable stylistic influences, and areas that contain the Hindemithian stamps of 3-9 and 4-23.

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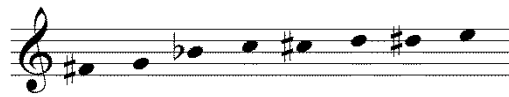
<sup>139</sup> Luttmann, Stephen, *Paul Hindemith: A Guide to Research* (New York: Routledge, 2005) p. 344.

<sup>140</sup> 'Die Komposition der Sätze vollzog sich in nachstehender Reihenfolge (wobei bei den je an einem einzigen Tag geschriebenen Sätzen natürlich auch die umgekehrte Folge, wenngleich etwas weniger wahrscheinlich, denkbar ist): Zuerst entstand der 4. Satz (am 7. März 1922), zwei Tage später (am 9. März) der 2. und der 3. Satz, und nach einer Pause von gut einer Woche folgten schließlich die Ecksätze des Werkes, der 1. und der 5. Satz (am 18. März) ... Nüchtern, doch voll selbstbewußtem Stolz schreibt Hindemith im Werkverzeichnis: „Die zwei Sätze I und V habe ich im Speisewagen zwischen Frankfurt und Köln komponiert und bin dann gleich aufs Podium und habe die Sonate gespielt.“ Hindemith, Paul, 'Streicherkammermusik II' *Paul Hindemith: Sämtliche Werke* (Mainz: Schott & Co., 1993) foreword by Danuser, Hermann, p. XIX.

A fundamental question is: did Hindemith favour certain pitch collections in op. 25/1? And, if so, what are the properties of these collections? Let us begin with the first bar of op. 25/1, which is a motif that recurs throughout the movement and is based upon an octatonic pitch collection, 8-12, not to be confused with the octatonic scale, 8-28.

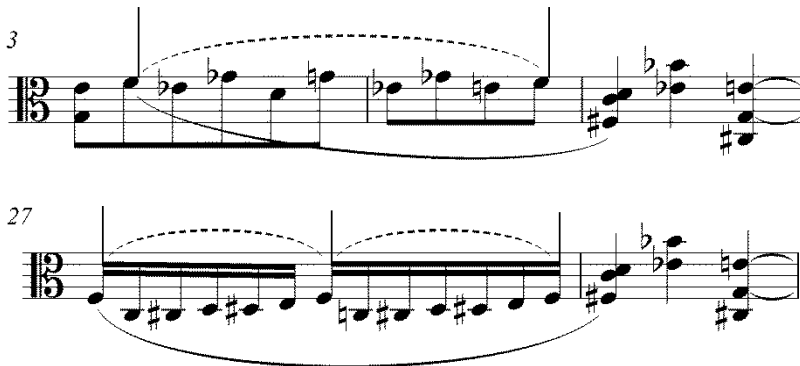


Example 4.11: op. 25/1 bar 1



Example 4.12: octatonic pitch collection bar 1

This pitch collection contains a prominent F# which is the central pitch to this movement. Not only does it underpin the first triad, but there are subsequent passages where the F# refers back to the diatonic function of a leading note, thus defining the F# as the tonal centre. In example 4.13, this is demonstrated by the voice leading – in bars three and four, the F is given prominence by its grouping position and repetition. In bar 27 the same is true, and the F is given greater emphasis by being in a metrically stronger position.



Example 4.13: op. 25/1 bb. 3-5 and 27-28.

These are just two examples; there are eight appearances of this motif, and in five the F# is directly preceded by a salient F natural. Apart from these occurrences, the first two happen at the outset of the piece, as a direct repetition, and can therefore be discounted. The F# is

therefore given greater prominence by the F $\sharp$  leading note, making it a fundamental pitch against which all others are hierarchically balanced.

The voice leading structure of the first motif points to C $\sharp$  as a secondary pitch centre, or as a dominant. This sets up interplay between pitch hierarchies, which Hindemith later believed to contribute towards implied harmony in *A Composer's World*:

The intervals produced by the successive tones of melodies have, in addition to their melodic function, harmonic significance, and we cannot fail to perceive it. These harmonies, again without our active interpretational participation, assemble around fundamental tones, as did the vertical harmonies, and thus again produce the effect of tonal perspective. In painting it is up to the painter to decide whether he wants to have perspective as a part of the pictorial effect or not. In music we cannot escape the analogous effect of tonal unification, of tonality. The intervals which constitute the building material of melodies and harmonies fall into tonal groupments, necessitated by their own physical structure and without our consent.<sup>141</sup>

## **Dissonant Prolongations and op. 25/1: First Movement**

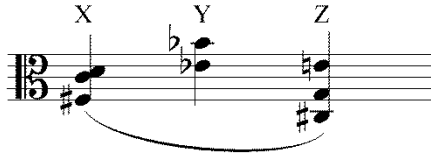
Neumeyer (1986) finds that the opening 3-bar motif of the first movement is treated as a dissonant prolongation.<sup>142</sup> He borrows the term from Robert Morgan (1976), who adapts Schenker's concept of prolongation to a dissonant, rather than consonant, background.<sup>143</sup> This may be revised using the atonal prolongation model of chapter three. I have stated that F $\sharp$  is the primary pitch, followed by C $\sharp$ , and so one could understand that in the opening bar, the F $\sharp$  is prolonged over the structurally inferior beat two until the C $\sharp$  in beat three displaces, shown in example 4.14. This notion is reinforced by the motivic and metrical salience of X.

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<sup>141</sup> Hindemith, Paul, *A Composer's World: Horizons and Limitations* (Cambridge: Harvard University Press, 1952) p. 55.

<sup>142</sup> Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) p. 121.

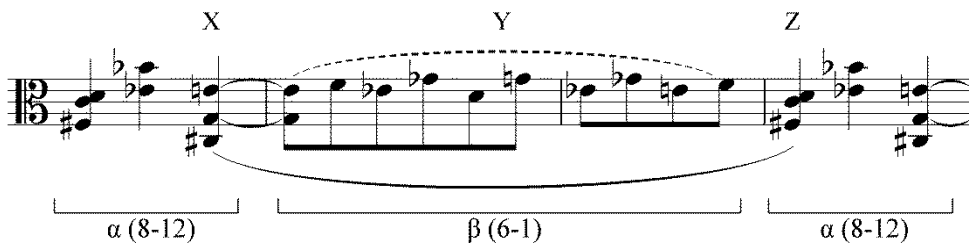
<sup>143</sup> Morgan, Robert P., 'Dissonant Prolongation: Theoretical and Compositional Precedents' *Journal of Music Theory* Vol. 20 No. 1 (Spring, 1976) pp. 49-91.



Example 4.14: dissonant prolongations in bar 1 where dissonance X is prolonged through a structurally inferior Y, before being displaced by Z.

This similarly applies to Neumeyer’s dissonant prolongational analysis, whereby the C# in the third beat of bar 1 is prolonged until the arrival of F# in bar 4 in example 4.15. However, care must be taken not to associate these single pitch prolongations with triadic prolongations, as they are prolonged by their salience and not by tonal implications.

The following example shows motif  $\beta$ , which is formed by two partial chromatic wedge shapes, sandwiched between two occurrences of motif  $\alpha$ . It begins and ends with an F $\flat$ , which serves to define the pitch centre of F#. It is based on the pc-set 6-1, which associates it with bar 27, which also emphasises the F $\flat$  leading note. The prolongation of the opening motif is therefore a combination of vertical (pitch) and horizontal (voice leading) elements.



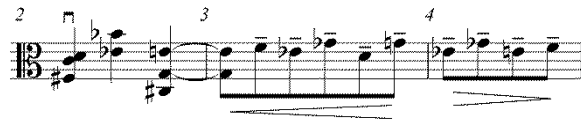
Example 4.15: op. 25/1, first movement, dissonant prolongation from bar 2 to 4.

The successive appearances of the opening motif ( $\alpha$ ) delineate the phrase structure. This becomes successively extended and exploits progressively wider octatonic collections. Each phrase prolongs motif  $\alpha$  by a greater distance:

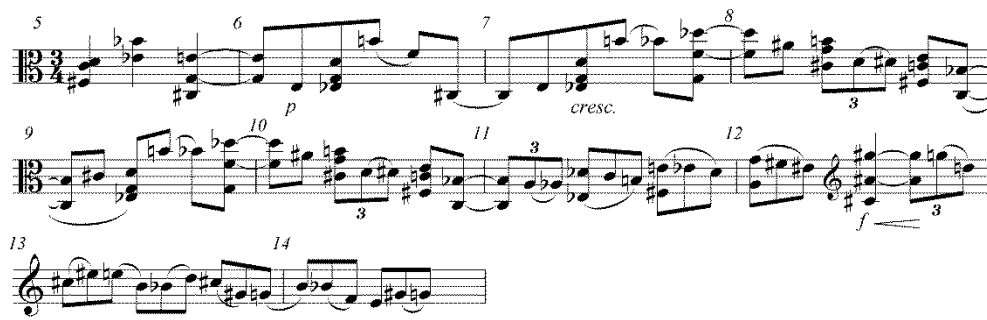
Phrase X<sub>1</sub>



Phrase X<sub>2</sub>



Phrase X<sub>3</sub>



Phrase X<sub>4</sub>



Example 4.16: op. 25/1, first movement, phrase structure.

Unlike my earlier analysis of the 1922 violin fragment (ex. 4.4), it is not practical to annotate the complete score of op. 25/1. Therefore, my following analyses are displayed in synoptic tables, which show pitch segmentation alongside motivic and overall structure. While Hindemith's metre is free, the presence of bar lines indicates the phrasing structure.<sup>144</sup> This

<sup>144</sup>As Forte has stated 'A particular composer's way of composing [...] provides guides for segment determination'. Forte, Allen, *The Structure of Atonal Music* (New Haven: Yale University Press, 1973) p. 91.

serves as both a performing aid and a guide to pitch segmentation. This leads to the conclusion that Hindemith demonstrates a preference for octatonic collections in the majority of bars in this movement.

Phrase	Measures	Pitch Collection	Motifs/	Subsets	Comments
<b>X<sub>1</sub></b>	<b>1</b>	<b>8-12</b>	<b>α</b>		
<b>X<sub>2</sub></b>	<b>2</b>	<b>8-12</b>	<b>α</b>		
	3-4	6-1	β		Chromatic wedge. Dissonant prolongation. Emphasises F leading note.
<b>X<sub>3</sub></b>	<b>5-7</b>	<b>8-12</b>	<b>α</b>	<b>7-8</b>	
	8	9-3			
	9	7-26			
	10	9-3			
	11	8-26			
	12	8-7			
	13-14	8-28		6-z13	
<b>X<sub>4</sub></b>	<b>15</b>	<b>8-12</b>	<b>α</b>		
	16-17	8-4		5-3	6-z4
	18-19	8-20/ 8-8			Segmentation discrepancy – see below. The pc-set 8-8 assumes two passing notes; 8-20 assumes two pedal notes. Octatonic and whole tone subsets.
	20	6-2	4-10	4-21	
	21	8-3			
	22-23	5-3			See bar 16.
	24	8-2			
	25	CHROM			The only fully chromatic bar
	26-27	-	6-1		Outlines pitch collections with voice leading.
<b>X<sub>2</sub></b>	<b>28</b>	<b>8-12</b>	<b>α</b>		
	29-30	6-1	β		Chromatic wedge. Dissonant prolongation.
<b>X<sub>3</sub></b>	<b>31</b>	<b>8-12</b>	<b>α</b>		
	32	8-12			
	33	*7-19			Similar to bar 8, pc-set 8-17. Altered to emphasise F leading note.
	<b>34</b>	<b>8-12</b>	<b>α</b>		
	35	4-2			
	<b>36</b>	<b>8-12</b>	<b>α</b>		
	37-38	4-2			
	39-40	6-21			Residues of motif α. Bar repeated.
	41	4-4			Cadence on the ‘dominant’.

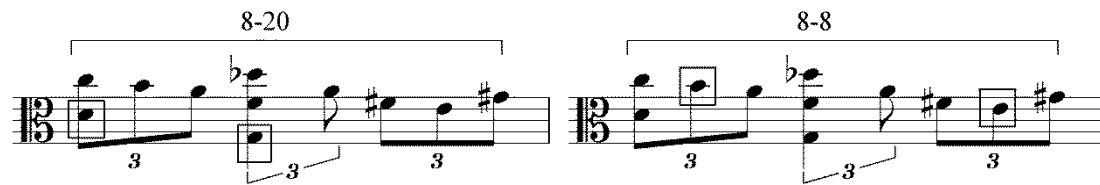
Table 4.1: Hindemith op. 25/1: first movement synopsis.  
Dotted lines differentiate between phrases.  
Appearances of the main motif, α, are in bold.

There are nine different octatonic collections in this movement, delineated by bar structures. For so many bars to include exclusive octatonic collections indicates the possibility that this was a conscious compositional process. Moreover, that there is such a high figure is testament to Hindemith's exhaustive handling of pitch materials. It is also possible that the process of exploring the different octatonic collections is to be understood as a way of developing the octatonic material of opening motif in bar 1, where the pc-set 8-12 is reserved only for the appearance of this motif. Phrase X<sub>3</sub>, demonstrated in example 4.17, is a strong example of Hindemith composing with octatonic, in addition to septatonic and nonatonic sets. This shows that not only did Hindemith write with a majority of octatonic collections, he also favoured sets with high cardinalities in each bar.

Example 4.17: op. 25/1, first movement bb. 5-14 pitch class segmentation.

Bars 18-19 present challenges to my salience conditions segmentation method. In bars 18-19 there are ten pitch classes, for which there are two possible readings: the first considers passing notes as foreign to the octatonic collection, in a similar way to my analysis of op. 11/5 (ex. 4.5). This takes into account their metrical position and forms pc-set 8-8. The

second is that the open strings of D and G may be regarded as ‘pedal notes’, leading us to observe pc-set 8-20 from the remaining notes.



Example 4.18: op. 25/1, first movement bb. 18-19 pitch analysis.

Another possibility is that the edition is incorrect. Example 4.19 is taken from the autograph score, and while the copy is faint, there appears to be both an A $\flat$  on the third triplet of beat two and an E $\sharp$  on the second triplet of beat three. This would also make enharmonic sense to the performer. Were this to be the case, the complete bar would comprise pc-set 9-5. This then opens up other possibilities: for example, if we remove the triple stopping on beat two, the remaining pitches form 6-z23 – a subset of 8-28.



Example 4.19: op. 25/1, first movement autograph bb. 15-21.

A discrepancy also exists between the autograph and the published edition in bar 11. Example 4.20 clearly shows that Hindemith inserted a D $\sharp$  in the final triplet beat. This does not exist in the published edition, and so one is led to assume that the D is still flattened by the accidental on beat two. This would change the bar to pc-set 9-7, against the segmentation in example 4.16 and table 4.2 of 8-26. It is regrettably unclear as to whether the discrepancies are due to Hindemith’s decisions or typographical error.



Example 4.20: op 25/1, first movement autograph bb. 11-12.

In bars 25-27 there are two possible interpretations of the voice leading, illustrated in example 4.21, where collections are observed from either the beginning or the end of slur markings. The upper beam outlines notes from the C major scale, taken from the final pitch of each slur, while the lower beam outlines notes from A $\flat$  major, taken from the beginning of each slur. This is a rare instance of Hindemith going against the phrasing provided by the bar lines, and it is also the most chromatic point of the movement.

Example 4.21: op. 25/1, first movement bb. 24-27 voice-leading analysis.

This single movement, of 41 bars in duration, is therefore quite remarkable. It presents nine out of a total of 29 octatonic collections, averaging a new collection almost every four bars. This is quite an achievement in the concise exposition of pitch materials, particularly when at least seven bars form an exact recapitulation of the opening material. This must be related to Hindemith's intuitive compositional technique, given that this was one of the two movements composed entirely on a single train journey.

## Op. 25/1: Second Movement

The second movement of op. 25/1 focuses on the rhythmic and pitch variations of five motifs, labelled as  $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$  and  $\epsilon$  in synoptic table 4.2. While they are labelled separately, all motifs have a rhythmic triplet feature in common. Hindemith performs four primary operations on this material:

1. Approximate, but not literal transposition
2. Ornamentation
3. Fragmentation
4. Motivic inversion

A new alphabetical segment is only labelled if it bears little or no resemblance to previous segment. All others are numbered according to the order in which they first appear. Example 4.22 demonstrates the transformations that apply to the opening phrase,  $X_1$ .

The image displays a musical score for the second movement of Op. 25/1, illustrating four different appearances of the opening phrase,  $X_1$ . The score is organized into four systems, each representing a derivative of the original motif  $\alpha$ .

- Original motif  $\alpha$** : Located at the beginning of the first system (b. 1), marked with a forte (*f*) dynamic.
- Derivative 1**: Labeled "Approximate, but not literal transposition" (b. 3), showing a transposed and slightly altered version of the motif.
- Derivative 2**: Labeled "Ornamentation" (b. 14), featuring the motif with added grace notes and a crescendo (*cresc.*) dynamic.
- Derivative 3**: Labeled "Fragmentation" (b. 17), showing the motif broken into smaller segments, with a fortissimo (*ff*) dynamic.
- Derivative 4**: Labeled "Inversion" (b. 49), showing the motif inverted and marked with fortissimo (*ff*).

The score uses a 3/8 time signature and includes various musical notations such as triplets, accents, and dynamic markings.

Example 4.22: op. 25/1, second movement, different appearances of the opening phrase.

Phrase	Measures	Pitch Collection	Motifs/ Subsets	Supersets	Comments
<b>X<sub>1</sub></b>	<b>1</b>	<b>6-7</b>	<b><math>\alpha</math></b>		
	2	6-2			
<b>X<sub>2</sub></b>	<b>3</b>	<b>6-2</b>	<b><math>\alpha^{\text{APPROX}}</math></b>		Complementary Repetition
	4	7-9			
	5	6-2			
Y <sub>1</sub>	6	8-28/ 9-10	B		Two octatonic scales, apart from the E <sub>4</sub> 'wrong' note
	7	CHROM	$\Gamma$		
Y <sub>2</sub>	8	8-21	$\beta^{\text{APPROX}}$		
	9	4-10	$\Delta$	8-28	
Z <sub>1</sub>	10	8-2			
	11	8-2			
A <sub>1</sub>	12	5-31	E	8-28	
A <sub>2</sub>	13	8-28	$\epsilon^{\text{APPROX}}$		
<b>X<sub>3</sub></b>	<b>14</b>	<b>6-7</b>	<b><math>\alpha^{\text{ORN}}</math></b>		
	15	8-2			
	16	7-2			
<b>X<sub>4</sub></b>	<b>17</b>	<b>6-7</b>	<b><math>\alpha^{\text{FRAG}}</math></b>		
	18	6-7			
	19.1-19.2	3-1			
A <sub>1</sub>	19.3-21	8-12	E		
	22	8-7	3-9		Quartal trichord
	23	7-z12	3-9		Quartal trichord
A <sub>2</sub>	24	8-28			
	25	7-10			
	26	8-28			
	27	8-z15			
	28	8-z15			
	29	8-12			
A <sub>1</sub>	30-31	8-12			Literal repetition of A <sub>1</sub>
	32	8-7	3-9		Quartal trichord
	33	7-z12	3-9		Quartal trichord
A <sub>3</sub>	34	8-5			
	35	8-5			
	36	7-20			
	37	6-z6			
	38	8-16			
	39	6-18			
<b>X<sub>1</sub></b>	<b>40</b>	<b>6-7</b>	<b>A</b>		Recapitulation
	41	6-2			
<b>X<sub>2</sub></b>	<b>42</b>	<b>6-2</b>	<b><math>\alpha^{\text{APPROX}}</math></b>		
	43	7-9			
	44	6-2			
Y <sub>1</sub>	45	8-28/ 9-10	B		Two octatonic scales, apart from the E <sub>4</sub> 'wrong' note
	46	CHROM	$\Gamma$		
Y <sub>2</sub>	47	8-21	$\beta^{\text{APPROX}}$		
	48	4-10	$\Delta$	8-28	
<b>X<sub>5</sub></b>	<b>49</b>	<b>7-7</b>	<b><math>\alpha^{\text{INV}}</math></b>		Inversion

	50-51	8-3			
	52	9-1	$\delta^{\text{APPROX}}$	CHROM	Rising octatonic scale pattern
			8-28		
	53-54	6-35			Descending whole tone scale pattern
<b>X<sub>3</sub></b>	<b>55</b>	<b>6-7</b>	$\alpha^{\text{ORN}}$		Repeat of phrase X <sub>3</sub>
	56	8-2			
	57	7-2			
<b>X<sub>6</sub></b>	<b>58</b>	<b>6-7</b>	$\alpha^{\text{FRAG}}$		Repeat of phrase X <sub>4</sub>
	59	6-7			
	60	3-1			

Table 4.2: Hindemith op. 25/1: second movement synopsis.

Dotted lines differentiate between phrases.

Appearances of the main motif,  $\alpha$ , are in bold.

$\alpha^{\text{APPROX}}$  APPROXIMATE, but not literal transposition

$\alpha^{\text{ORN}}$  Motif is ORNAMENTED

$\alpha^{\text{FRAG}}$  Motif FRAGMENTED

$\alpha^{\text{INV}}$  Motif is INVERTED

This table shows that the second movement is based almost entirely on four motifs. In addition to the operations performed on these motifs, Hindemith treats certain intervals with motivic qualities. Describing a single interval as ‘motivic’ within a piece is generally quite risky; it can lead to all manner of relationships which are utterly irrelevant. However, within this single movement the intervals of a perfect fifth and minor seventh receive special treatment which can only be described as motivic. This treatment includes not only the reappearance of the intervals on the same pitches, but other operations that are associated with motifs, such as fragmentation and sequential repetition. As a result, these are the most regular intervals found in the double stopping of this movement. In the first bar, it is also possible to arrange all of the pitches from the four consecutive fifths to create the quartal trichords [D G A] and [C# D# G#].



Example 4.23: op. 25/1, second movement, prominence of perfect fifths and minor sevenths in opening motifs.

These prominent intervals initially appear in the pc-sets 6-7 and 6-2 respectively, before being placed within bars characterised by other collections, showing that they do not exist within a specific set. The motivic ‘development’ of the seventh is substantial, ranging from simultaneous triads (triple-stopped) to compound melody, to rhythmically displaced pitches (bar 13). Bars 9, 48 and 52 combine both the seventh interval and the octatonic scale (8-28) as shown in example 4.24. There is also a strong reference to the whole tone scale from bars 53-54 in a pseudo re-transition to the opening phrase.

Example 4.24 consists of two musical systems. The first system, labeled '8-28 subset', shows bars 9 and 48. It features a treble clef with a melodic line and a bass clef with a bass line. The second system, labeled 'Seventh chords without thirds', shows bar 52. It features a treble clef with a melodic line and a bass clef with a bass line. The notation includes notes, rests, and chord symbols.

Example 4.24: op. 25/1, second movement, bb. 9, 48 and 52.

As in the first movement, the bar lines delineate pitch collections of high cardinal values. The middle section contains predominantly octatonic collections, which contrasts with the hexatonic collections of the outer sections, as shown in table 4.2. It is possible that the beginning of the first phrase of this section, from bars 19.3-21, is a deliberate reference to the opening motif of the first movement, consisting as it does of the pitches from set 8-12. The chromatic progression from bar 22-23 warrants close inspection, shown in example 4.25. The compound melody constitutes an implied triadic progression, descending chromatically from C to G. All parts move by semitone, apart from the two inner pitches, labelled at bars 22.3 and 23.2. Why do these pitches not move by semitone? One possible answer may be that Hindemith wanted to create contrary motion between the inner parts of the compound triads, which is also combined with the contrary motion of the original

melody. Three of the compound beats in this example also comprise variants of the 3-9 quartal trichord.

Example 4.25: op. 25/1, second movement, bb. 22-23 linear reduction.

There is regular reference to the octatonic scale (8-28) in this movement: so much so, that many of the motivic manipulations may be seen as a play on the possibilities inherent in the collection. Within this collection, one is able to construct both minor sevenths and perfect fifths. Below are two examples of the octatonic scale where the seventh is given musical prominence.

Example 4.26: op. 25/1, second movement, bb. 12-13 octatonic scales.

### Op. 25/1: Third Movement

This movement showcases an extraordinary command of variation technique within a post-tonal musical language. I describe bars 1-3 as the opening theme, which means that the piece

is monothematic. The opening bars undergo a variety of operations which are demonstrated in example 4.27. These include three forms of transposition: the first is partial, which literally transposes a section of the motif. The second is a tonal transformation whereby the contours of the motif are transformed into one more resembling a tonal triad. The third is a mixed transformation which includes the introduction of new voices and an altering of the direction of the melody. Hindemith also inverts the general contours of the motif. This motif demonstrates all of the characteristics of a Sarabande, which is also found in the fifth movement.

1 **Original theme**

4 **Derivative 1**  
Partial Transposition

7 **Derivative 2**  
Tonal Transformation

12 **Derivative 3**  
Mixed Transformation

14 **Derivative 3**  
Mixed Transformation

37 **Derivative 4**  
Inversion

Example 4.27: op. 25/1, third movement, motif transformations.

Unlike the previous movements, there are several areas that can be convincingly defined as chromatic, particularly bars 29-32 in example 4.28, which fills out the interval of a fourth with semitones. This makes this movement the most unstable in its use of pitch collections.

There is also less of a pattern in the pitch collections when one compares the segmentation in each bar, which contrasts with my findings in the previous two movements. This is summarised in table 4.3. As a result, there are only four occurrences of the quartal trichord, in bar 41 shown in example 4.29, and in the transpositions of the opening bar found in bars 4, 16 and 63.



Example 4.28: op. 25/1, third movement, bb. 29-33.



Example 4.29: op. 25/1, third movement, bb. 40-41 instance of 3-9 trichord.

Phrase	Measures	Pitch Collection	Motifs / Subsets	Supersets	Comments/ Performance Directions
<b>X<sub>1</sub></b>	<b>1-3</b>	<b>6-z3</b>	<b><math>\alpha, \beta, \gamma</math></b>		
<b>X<sub>2</sub></b>	<b>4-6</b>	<b>6-z11</b>	<b><math>\alpha^{+1}, \beta, \gamma</math></b> <b>3-9</b>		Complementary repetition; pause sonority missing fifth
X <sub>3</sub>	7-8	8-17	$\alpha^{\text{CON}}, \delta$ 3-9		
	9-11	8-3	$\alpha^{\text{CON}}, \alpha^{\text{R}}$		
	12-13	7-8	$\alpha^{\text{R}}, \beta^{+3}$		
	14-15	8-2	$\alpha^{\text{R}}, \beta^{-3}$		
<b>X<sub>2</sub></b>	<b>16-18</b>	<b>6-z11</b>	<b><math>\alpha^{+1}, \beta^{+1}, \gamma</math></b> <b>3-9</b>		
Y <sub>1</sub>	19-20	6-14	$\delta$		
	21-22	5-16	$\delta^{\text{SIM}}$		
Z <sub>1</sub>	23	5-22			
Z <sup>EXT</sup>	24-25	9-11	5-22	6-z26	
Z <sup>T</sup>	26	5-22			
Z <sup>T+EXT</sup>	27-28	7-21	5-22	3-12	6-35
Z <sub>2</sub>	29-32	6-1			CHROM
X <sub>4</sub>	33-34	5-5	$\beta^{-6}, \gamma$	5-5	CHROM
	35-36	4-1	$\beta^{-13}, \gamma$		
Z <sub>3</sub>	37-39	6-z4	4-3	5-6	8-28
	40-41	9-2	4-3; 3-9	5-20	Inversion Quartal trichord
	42-45	8-1	4-3	5-6	
	46	5-1			
	47-48	8-18	7-z36	6-5	
	49-51	8-19	7-22	4-3	
	52-53	8-21	6-35		Whole tone scale
	54-55	7-4	6-z10	4-3	
	56-59	5-6	4-8		
<b>X<sub>1</sub></b>	<b>60-62</b>	<b>6-z3</b>	<b><math>\alpha, \beta, \gamma</math></b>		
	63-65	6-z11	<b><math>\alpha^{+1}, \beta, \gamma</math></b> <b>3-9</b>		
X <sup>EXT</sup>	66	9-3			
	67-69	9-3	7-21	7-z36	
	70-71	3-6			

Table 4.3: Hindemith op. 25/1: third movement synopsis.

Dotted lines differentiate between phrases.

Appearances of the main motif,  $\alpha$ , are in bold.

$\alpha^{\text{CON}}$  Motif CONVERTED into a tonal form

$\alpha^{\text{R}}$  RHYTHMIC form of motif is all that remains: pitch similarities disintegrate

$\alpha^{\text{EXT}}$  Motif is EXTENDED

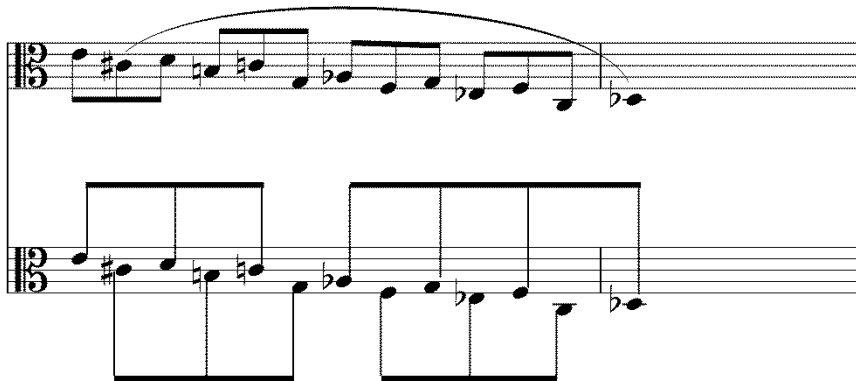
$\alpha^{\text{T}}$  Motif is an exact TRANSPOSITION of a previous form.

The alteration of pitches within a motif is shown by using the symbols + for intervals raised and – for intervals lowered. The numerical value of this transformation based on interval cardinality whereby a unison = 0, a semitone = 1, a tone = 2 and so forth.

Table 4.3 shows that the pitch collections have significantly lower cardinalities compared to the first two movements. This is a result of the slower pacing of the music, and of the longer

phrase structures. Similar to the second movement, it is saturated with motivic developments, specifically, of the three motivic cells of the opening three bar theme.

Bar 66 presents a challenge to successful segmentation and interpretation, as shown in example 4.30. The compound melody clearly refers to two separate voices. The upper voice could be described as 7-z38 and the lower as 6-22 – however, this masks the possibility of a diatonic interplay. The first three notes of the upper ‘voice’ are part of the C major scale, while the final four notes are part of the A $\flat$  major scale. In the lower ‘voice’ the first three notes outlined could refer to D major, while the last three notes could be understood within the context of A $\flat$  major. A modal understanding of this passage is also possible. It is potentially misleading, therefore, to label the entire pc-set in this instance, as it is better understood as a deliberately ambiguous interplay between diatonic scales and modes.



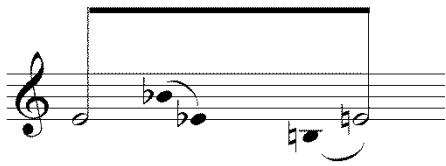
Example 4.30: op. 25/1, third movement, b. 66.

The pauses are structurally significant in this movement. They land on the following bars:

3      6      18      34      36      59      62      65      71

The first three pauses outline the sequence  $x_n = x_1x_{n-1}$ . The fifth pause also follows this plan if one omits pause four, although a scheme for the remaining pauses is unclear. While all

pauses land on either an E, which is the pitch centre, or a B, which is the secondary pitch centre, the material immediately preceding them – which is usually motif  $\beta$  – outlines a different scheme. Following the beginning of a contrasting section from bar 19, this motif appears in bar 33 on a B $\flat$ , which is a tritone away from the pitch centre. This is immediately followed in bar 34 by the same motif on an E $\flat$ . This fifth relationship creates a large scale pitch and proportional design outlined in example 4.31.



Example 4.31: op. 25/1, third movement, pitch centre plan.

### **Op. 25/1: Fourth Movement**

The fourth movement is the most regularly cited in secondary literature. Its rhythmic intensity is striking, and while the outer movements demand a great deal of virtuosity from the performer, this movement provides it in a direct, striking and obvious form. Example 4.32 is a voice leading reduction of the complete movement. In this reduction, one may observe the linear patterns formed over the C pedal, which is the main compositional device in the movement. These linear patterns form large scale pitch structures. It is also possible to trace several pitch structures based on the octatonic scale in the middle section, when the ‘melody’ is heard over G $\sharp$  and A $\sharp$  pedals as shown in example 4.33.

Example 4.31: op. 25/1, fourth movement, voice leading reduction.

Example 4.32: op. 25/1, fourth movement, 'pedal' points.

The voice leading reduction in example 4.31 shows that, despite the constantly changing compound metre, there are clear intervallic patterns. These are predominately chromatic, such as bars 40-52 and 71-76, in addition to a double stopping motif which descends by semitone. The reduction also illustrates the general sense of gravity in the movement whereby the overall progression of a section ends with a descent towards C. The main structural areas shown in example 4.32 include the four open strings of the viola [C G D A]. While this work is striking for the way it avoids theory (one could describe it as anti-

theoretical), this fourth movement it is still based on a background structure of the quartal tetrachord 4-23. This foreshadows the quartal background structures of much of Hindemith's post-*Unterweisung* music.

There can be little doubt that this movement conforms to a pre-determined formal plan, even though it was written at great speed. It is also possible that Hindemith used the Fibonacci Sequence, a series of numbers where each successive term is found by the sum of the previous two ( $x_n = x_{n-1} + x_{n-2}$ ). Table 4.4 shows the proportional design of the complete movement. If we zoom out from the rhythmic structures of each bar, to the larger structure, which is a standard rounded-binary, we still find a relatively irregular plan whereby the number of bars per section follows the pattern 19 – 32 – 41. However, if we count the number of crotchet beats in each of these section we are provided with a very different picture. Section A, with its irregular number of 19 bars, has 132 crotchets. Section B with 32 bars has 268 beats, while section A<sub>1</sub> with 40 bars, has 576 beats (excluding the final bar, as it is not possible to specify the precise number of beats of the paused breve). If we add these beats together, there are a total of 976, excluding the repeat of the first section and the final note. Perhaps more than coincidentally, the 17<sup>th</sup> member of the Fibonacci Sequence is 987: if we add the crotchet value of a paused breve to our earlier figure of 976, this becomes exceedingly close to the figure. One may also wonder if the extraordinary tempo marking, crotchet = 600-640, is also related to the 16<sup>th</sup> member of the Fibonacci Sequence, which is 610. This is another possible way in which Hindemith tried to systematise his compositional process, within the short timeframe of the train journey from Frankfurt to Cologne.

mm.	<b>Exposition</b> 1-19		<b>Development</b> 20-51			<b>Reprise</b> 52-92		
Total bars:	19		32			41		
Total beats:	132		268			576		
Total bars:	A	X	B	P	P <sub>1</sub>	A <sub>1</sub>	X	Y
mm.	1-12	13-19	20-29	30-36	37-51	52-63	64-70	71-92

Table 4.4: Hindemith op. 25/1: fourth movement, proportional design.

## Op. 25/1: Fifth Movement

The slow tempo and emphasis on the second beat of the bar indicates a reference to a Sarabande, which may be traced to Hindemith's affinity for the music of J. S. Bach, and performing knowledge of his solo string music.<sup>145</sup> The complexities of this movement lie in its reference to material from the previous four movements: as cited previously, it was written alongside the first movement on the day of the premiere on 18 May 1922, after the completion of the inner movements. Table 4.5 also shows that there are considerably more expressive performance markings than the other movements. It may have been the case that Hindemith felt that the expressive character of the music was less explicit in this movement; although it is notable that Černý's edition includes a considerable amount of additional markings.

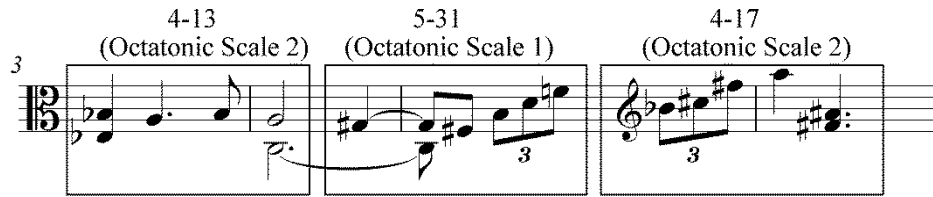
Unlike the first and second movements, the pitch collections are formed over the course of several bars within slightly longer phrases. The majority of these phrases can be deconstructed into two bar cells, with only three exceptions. It is possible, however, to view the phrase structure in a slightly different way, shown in example 4.33, whereby the opening bar is treated as an anacrusis. However, I have chosen to avoid this interpretation due to the caesura in bar four, therefore understanding each phrase as two bars in length. There are intermittent octatonic scales in this movement, although they overlap within the phrase structure, such as bars 4-5, shown in example 4.34. Given the seamless pitch structure of the movement as a whole, it is unsurprising that the pitch structures also interlink.

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<sup>145</sup> Hindemith published a short monograph on Bach entitled *Johann Sebastian Bach: Heritage and Obligation* (New Haven: Yale University Press, 1952).



Example 4.33: op. 25/1, fifth movement, bb. 1-8 possible phrase interpretations.



Example 4.34: op. 25/1, fifth movement, bb. 3-6 octatonic pitch collections.

Phrase	Measures	Pitch Collection	Motifs / Subsets	Supersets	Comments
<b>X<sub>1</sub></b>	<b>1-2</b>	<b>8-2</b>	<b>α</b>		
	3-4	4-13	α <sup>R</sup>	8-28	
	5-6	8-17	5-31	4-17	8-28
	7-8	7-1	5-1	4-13	8-28
	9-10	7-32			See opening 4 bars
X <sub>1</sub>	11-12	7-9			
	13-14	8-2			
	15-16	4-13			
	*17-19	5-3			
	20-21	-			Transition
Y <sub>1</sub>	22-23	9-5	4-24	7-19	
	24-25	6-22			Inversion of bar 6
	26-27	8-7	5-21		
Y <sub>2</sub>	28-29	7-z18			
	30-31	7-z18			Transposition
	32-33	6-z4			
	34-35	8-26	5-z18		
	36-37	6-16			
Y <sub>3</sub>	38-39	4-11			
	40-41	4-3		8-28	
	*42-44	8-12	4-3	5-22	
	*45-47	6-z36	4-1		
	48-49	9-5	4-24	7-19	Repeat
	50	4-24			Fragmentation
<b>X<sub>1</sub></b>	<b>51-52</b>	<b>8-2</b>			
	53-54	4-13		8-28	
	55-56	8-17	4-17	5-31	8-28
	57-58	7-1	5-1	4-13	8-28
	59-60	7-32			
<b>X<sub>1</sub></b>	61-62	7-9			
	<b>63-64</b>	<b>8-2</b>			
	65-66	4-13			
	67-68	5-3			
	69-70	-			Transition
Coda	71-72	CHROM	7-21	8-12	Fully chromatic apart from D <sup>#</sup> / E <sub>b</sub>
	73-74	4-11			Reference to first movement
	75-76	5-9			
	77-78	CHROM	5-23	8-4	Fully chromatic apart from E
	79-80	6-z3			

Table 4.5: Hindemith op. 25/1: fifth movement synopsis.

X<sub>T</sub> Motif TRANSPPOSED without any rhythmic alterations

X<sub>F</sub> Motif FRAGMENTED

α<sup>CON</sup> Motif CONVERTED into a tonal form

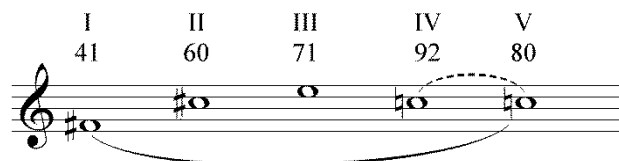
α<sup>R</sup> RHYTHMIC form of motif is all that remains: pitch similarities disintegrate

EXT Motive is EXTENDED

α<sup>SIM</sup> Motif is SIMILAR to an earlier form, but the interval transpositions have been slightly altered

## Overall Structure

So far I have analysed each movement in relative isolation, but viewed as a whole, in example 4.35, it is possible to identify two structures. Neumeyer (1986) has noted the significance that Hindemith must have allocated to formal proportions, and finds that some of his works from this period – such as the *Sonata for Viola and Piano* op. 25/4 and the Passion songs from *Das Marienleben* – ‘combine pure form with intensity in much the same way as the early Bauhaus paintings of Klee and Kandinsky’.<sup>146</sup> In op. 25/1, the size (in bar numbers) of each movement increases until the final movement. There appears to be a rough pattern whereby the difference between the bar numbers in each movement is 20-10-20-10. As the pitch of the final movement ends on a C, as with the fourth movement, it can be perceived as an extended coda. There is also a tritone relationship between the outer movements, which is a common structural force in Hindemith’s large scale pitch strategies. Finally, it is fascinating to observe that the four pitches that comprise the pitch arrangement of this sonata conform to the octatonic scale. That there are only four pitches, however, means that one must be cautious in drawing too many conclusions from it, but I find it fascinating that a movement which includes significant reference to the octatonic scale on a foreground level also has it potentially lurking in the background.



Example 4.35: op. 25/1, overall reduction of pitch and proportion.

<sup>146</sup> Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) p. 13.

#### 4.4 String Quartet op. 22

A study of op. 25/1 has demonstrated the way in which pitch collections may be identified using salient features within a predominately monophonic composition. Hindemith's *String Quartet* op. 22 presents the opportunity to examine similar procedures in a four-voice, contrapuntal setting.

Op. 22, catalogued as Hindemith's *Fourth String Quartet*, is the only quartet to appear in the *Unterweisung* appendix.<sup>147</sup> The date that Hindemith provides in this appendix (1922) also differs from that given in the *New Grove* list of his works, where op. 22 is stated as being written in 1921. On the inside cover to the published edition (1923, Schott & Co.) it states that the work was premiered on 4 November 1922 in Donaueschingen. The performance directions for each movement, which are typically detailed, are: *Fugato. Sehr langsame Viertel* (crotchet = 58-69) – *Schnelle Achtel. Sehr energisch* (quaver = 176-184) – *Ruhige Viertel. Stets fließend* (crotchet = 100-108) – *Mäßig schnelle Viertel* (crotchet = 80-88) – *Rondo. Gemächlich und mit Grazie* (crotchet = 92-100). These contrast with the more conservative directions in Hindemith's final quartets, which are far more simple and direct, such as the *Seventh String Quartet* (1945): *Schnell* – *Ruhig, scherzando* – *Langsam* – *Kanon, mäßig schnell, heiter*. It was written at a time when Hindemith's newest compositions were still reviewed favourably in Germany, such as the claim by Weißmann in *Die Musik* that op. 22 is 'a step further in the realm of the quartet'.<sup>148</sup>

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<sup>147</sup> It is worthy of note that Kube (1997, p. 182) provides us with small fragments of Hindemith's corrections to op. 22. Of the fragments provided, the small alterations made by Hindemith demonstrate simple modifications of melody which, most probably, have more to do with aesthetic than theoretical reasons. They can therefore be discounted in this thesis as they do not have the same implications as other more substantial revisions, such as *Das Marienleben*.

<sup>148</sup> Weißmann, review of Hindemith's op. 22 in *Die Musik* 16 (1924) pp. 579-587.

This work has many features that are similar to op. 25/1, such as a use of octatonic pitch collections and both vertical and horizontal constructions made from quartal fourth chords. This is exemplified by the opening of the first movement (ex. 4.36), which starts by outlining the hexachord 6-32, which may be split into two 3-9 trichords. Bar three forms 5-10, which is a subset of the octatonic scale. Bars two to four may also be understood as a play between the scales of D major and C# minor, forming a tension between G $\flat$  / G $\sharp$  and D $\flat$  / D $\sharp$ .

D Major ↔ C Sharp Minor

Example 4.36: op. 22, first movement, fugue subject, bb. 1-4, first violin solo.

However, with the introduction of counterpoint in more than two parts, which sets it apart from op. 25/1, it becomes less practical, and less informative, to segment pitch collections based on each individual bar, as many of the collections include upwards of ten pitches. This is particularly true in the fugue exposition at the beginning of the first movement. While each voice conforms to an inner logic of voice leading and pitch cohesion, when they overlap, in more than two parts, they do not conform to the logic of each other. The previous example showed some of the pitch characteristics of the fugue subject. When accompanied by the first countersubject in bar 5, Hindemith writes with octatonic and septatonic collections. But following the double (and unexpected, in the standard fugue exposition) entry of both the third and fourth voices in bar 12, the collections enlarge to encompass ten pitches, and then all twelve pitches by bar 14. This serves to build a climax in the musical tension, which becomes ever more dissonant as each bar becomes saturated with

all available notes in the chromatic scale. As before, each line maintains a clear internal logic, but their contrapuntal combination creates dense, genuine chromaticism.

Another example of the internal logic of a single voice is the 'cello bass line in the first movement. The voice leading can be explained almost entirely as interlocking fifths, fourths and semitones, although a hierarchy amongst these pitches is difficult to detect. This is shown in the following example, where dotted slurs indicate fourths and fifths, and black slurs indicate semitones:

The image shows two staves of musical notation in bass clef. The first staff is labeled '49' and the second '53'. Both staves contain a sequence of notes with various slurs. Dotted slurs connect notes that are fourths or fifths apart, while solid black slurs connect notes that are semitones apart. The notes are mostly eighth notes, with some quarter notes. The key signature has two flats (B-flat and E-flat).

Example 4.37: op. 22, first movement, 'cello part bb. 49-56. It shows interval relations of fourths, fifths and semitones, within the proximity of two-four pitches to each other (with the exception of the clear descending fifth at the end of the passage spanning five notes).

This bass line appears from bar 49, combined with a recapitulation of the opening fugue subject in the first violin. It begins by forming octatonic and septatonic collections in counterpoint, until the entry of the subject in the third voice at bar 53, as was the case with the two-part counterpoint at the beginning of the movement. After this point, the pitch collections again become increasingly dense, until bar 63 which is fully chromatic.

49 8-23 8-4 7-25 7-6

53 10 pitches (no pc-set name) 8-4 9-11 8-3

*pp* *pizz.* *sehr leise aber bestimmt*

*p* *pp* *poco cresc.*

*poco cresc.*

Example 4.38: op. 22, first movement, bb. 49-56.

60 11 pitches, no Eb 11 pitches, no D 9-10 Fully dodecaphonic

*pp sehr zart*

*pp sehr zart*

*p*

Example 4.39: op. 22, first movement, bb. 60-63.

The fourth movement contains concise pitch collections which are devised in a similar manner to op. 25/1, and the 'cello part is strongly reminiscent of the *Sonata for Solo 'Cello* op. 25/3, with regard to its angular, yet coherent, voice leading. Within the opening three bars,

which contain two septachords, there is a descending pattern outlining 4-26, a subset of the pentatonic scale and an incomplete quartal tetrachord. The salient features of the double stopping also create a hierarchy between the fifth, C/G, and passing fifths D/A and G/D.

The image shows a musical score for a cello solo, measures 1-3. The score is written in bass clef. Measure 1 contains a melodic line with notes G2, A2, B2, C3, D3, E3, F3, G3. Measure 2 contains a melodic line with notes G2, F2, E2, D2, C2, B1, A1, G1. Measure 3 contains a melodic line with notes G1, F1, E1, D1, C1, B0, A0, G0. Annotations include: '7-19' above the first measure, '7-22' above the second measure, and '4-26, subset of 5-35' above the second measure. A dashed line connects the notes G1 and G3 across measures 1 and 3. A solid line connects the notes G2 and G1 across measures 1 and 2. A solid line connects the notes G2 and G1 across measures 2 and 3. A solid line connects the notes G2 and G1 across measures 1 and 3.

Example 4.40: op. 22, fourth movement, 'cello solo, bb. 1-3.

One of Hindemith's contrapuntal methods in this movement is to overlap motifs. This includes a transposition of the second bar of the opening 'cello solo to the second violin and viola parts, and its placement within a transposition of the third bar of the work in the outer parts in bar 20 (ex. 4.41). Identifying that this bar comprises pc-set 9-5 does not do justice to this contrapuntal procedure, nor to the fact that it is the pitch collections of the individual lines, rather than their sum, that contain the most revealing elements. Viewed in isolation, bar two comprises pc-set 7-22 (interval vector 424542) which includes a high number of fifths, while the second violin motif in bar three comprises pc-set 5-27: part of the melodic minor scale on C or major scale on E $\flat$ , pc-set 7-35.

Example 4.41: op. 22, fourth movement, bb. 2-3 compared with b. 20.

Op. 22 has similarities to op. 25/1 in terms of character and rhythm. The Stravinskian aspect of Hindemith's rhythmic metre is alluded to in an analysis of the quartet by Kube (1997). He traces the 3-2-2 metre to Stravinsky's *Three Pieces for String Quartet* (1914, rev. 1918), shown in example 4.42, to letter Q in the second movement of Hindemith's op. 22, shown in example 4.43.

Example 4.42: Stravinsky, *Three Pieces for String Quartet*, first movement, bb. 7-11.

Example 4.43: Hindemith, op. 22, second movement, figure Q.

While Hindemith is only documented to have played Stravinsky's *Three Pieces* on two occasions with the Amar Quartet – the first in Frankfurt on 27 September 1923 and the second on 3 January 1929 – the connection made by Kube is provocative. However, what he does not take into account is the nature of bar lines in the two extracts. Hindemith's bar lines are very precise and correspond clearly to phrase structures, as also found in op. 25/1, and yet Stravinsky's phrasing seems to be almost deliberately *against* the bar lines. Notwithstanding this issue, the general character points to a similar aesthetic between the two composers.

The overall formal designs in op. 22 show an exploitation of existing techniques. In the first movement, Hindemith engages with a fugato structure, which could be defined as neo-Baroque. It is relevant to observe that this is a fugato and not a fully formed fugue. This is corroborated by the absence of the returning countersubjects that one would associate with mature fugue writing in the eighteenth century (a technique Hindemith was to use twenty years later in his *Ludus Tonalis*), discounting the simple repetition of the counterpoint in the viola entry after figure D. The formal technique in this movement is therefore a reference to either the imitative fugato of the Renaissance polyphonists, or to the fugato one would associate with the Classical Style. Table 4.6 is a synopsis of Hindemith's fugal design in this movement. It shows that there are frequent appearances of the subject, many of which are subject to transpositions and rhythmic and intervallic transformations. He does not use conventional devices such as stretto or augmentation, but focuses on the incomplete presentation of the subject.

These techniques define a specifically Hindemithian fugato – intervals and harmony aside – which sets him apart from other twentieth-century fugue composers. Whittall (1999) believes op. 22 to be the most highly regarded of Hindemith’s quartets, and briefly alludes to the possibility of a Bartókian influence without pursuing the matter further.<sup>149</sup> Hindemith’s Frankfurt composition tutors Bernhard Sekles and Arnold Mendelssohn provided him with a thorough grounding in conventional fugue writing, beginning with two-voice fugues for piano.<sup>150</sup> Hindemith then exploited this and other forms by continually toying with conventions. In the fugal synopsis below, note how, in the fugue exposition, the ‘cello and viola enter together for what should be the entrance of the subject for the third time in bar 12. This entry is also incomplete, thus deforming the expected shape of a fugue exposition.

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<sup>149</sup> Whittall, Arnold, *Musical Composition in the Twentieth Century* (Oxford: Oxford University Press, 1999) pp. 136-139. He refers to op. 22 as the third quartet, rather than the fourth.

<sup>150</sup> Skelton, Geoffrey, *Selected Letters of Paul Hindemith* (New Haven: Yale University Press, 1995) p. 5.

	1-4	5-8	9-11	12-14	15-16	17-19	20-22	23-26	27-29	30-31	32-33
Violin 1	<b>S (G)</b>	CS 1	TR	X <sup>SEQ</sup>	CS 1	X	-	FC	Trills	Trills	Trills
Violin 2	-	-	-	FC	<b>IE (G#)</b>	CH	<b>IE (F#)</b>	FC	<b>IE (A)</b>	X	Trills
Viola	-	<b>A (F)</b>	TR	X <sup>SEQ</sup>	FC	CH	FC	FC	CH	FC	X
‘Cello	-	-	-	<b>IE (A<sub>b</sub>)</b>	X <sup>1</sup>	CH	X	FC	CH (C Pedal)	FC	X, CH

	34-42	43-45	46-48	49-52	53-56	57-59	60-62	64-66	67-69	70-72	73-77
Violin 1	Episode			<b>S (G)</b>	CS 1	TR	<b>IE (D)</b>	FC	<b>IE (E)</b>	<b>IE (C#)</b>	<b>IE (G#)</b>
Violin 2	Episode			-	-	-	FC	FC	CH	IE (A)	CH
Viola	Episode			-	<b>A (F)</b>	TR	FC	<b>IE (F#)</b>	CH	CH	CH
‘Cello	Episode			FC	FC	TR	FC	CH	CH	CH	CH

Table 4.6: Fugal synopsis of Hindemith's *Third String Quartet* op. 22.

- S = Subject
- A = Answer
- CS = Countersubject
- FC = Free Counterpoint
- TR = Transition
- X<sup>SEQ</sup> = Treated sequentially
- IE = Incomplete entry
- CH = Chordal emphasis

## 4.5 Conclusions

The music studied here is representative of Hindemith's early published compositions. Op. 25/1 showcases Hindemith as a virtuosic and provocative solo performer, composing for a performance at breathtaking speed, while his *String Quartet* op. 22 demonstrates a far more cerebral side to his compositional strategies. This is represented by his dense counterpoint, motifs formed via 'Hindemithian' pitch collections based on fourths such as 6-32, and reference to older forms such as fugato and passacaglia. Hindemith's more intellectual approach was eventually to monopolise his output after the formalisation of his compositional technique in the *Unterweisung*. Signs of this attitude may also be found in the large-scale planning of op. 25/1, with reference to the placement of pause chords in the third movement and the bar structure of the fourth movement.

Aside from Neumeier's work, very little detailed pitch analysis has been conducted in connection with Hindemith's music. This is surprising given the richness of the field. My work here, existing as it is within a larger study, is intended as an initial, but far from exhaustive, investigation. Perhaps as a result of the diversity of pc-sets within this music, it is not possible to establish a 'grand unifying theory', such as that applied to the music of Bartók by Richard Cohn.<sup>151</sup> It is not my intention to invent any such theory here, but to provide insights into various facets, particularly in connection with pitch, motif and proportion, of Hindemith's early compositions.<sup>152</sup>

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<sup>151</sup> Cohn, Richard, 'Bartók's Octatonic Strategies: A Motivic Approach' *Journal of the American Musicological Society*, Vol. 44, No. 2 (Summer, 1991) pp. 262 -300 and 'Properties and Generability of Transpositionally Invariant Sets' *Journal of Music Theory*, Vol. 35, No. 1/2 (Spring - Autumn, 1991) pp. 1-32.

<sup>152</sup> It is important, however, to heed the warnings of Dmitri Tymoczko where he writes, in reference to Stravinsky, that the octatonic scale has been applied too liberally. He offers an alternative reading, observing that it is possible to achieve a similar understanding of pitch using 'modal use of non-diatonic minor scales, and superimposition of elements belonging to different scales'. I believe that this understanding is possible in the

In this period of Hindemith's music there are a multitude of compositional devices and logical processes for which the terms 'chromatic' and 'atonal' are not sufficient. I believe that the use of these terms has effectively dumbed down Hindemith's complex musical syntax. He uses pitch collections, often with high cardinalities, outlined by salient features such as bar lines and phrasing. Within this, there are appearances of quartal chords as well as motivic patterns and developments. Hindemith creates pitch hierarchies from both voice leading and salient characteristics, and these may be linked to large scale pitch and proportional designs.

A close reading of Hindemith's early string works also highlights stylistic characteristics that are connected to his activities as a chamber musician. In particular, these pre-*Unterweisung* compositions have strong connections to the neo-Classicism of Stravinsky and pre-dodecaphony of Schoenberg, and to pitch collections in Bartók and Debussy. Stravinsky had a notable influence upon Hindemith's concept of rhythm and metre, as is evident in the second movement of his *String Quartet* op. 22 and the fourth movement of the *Sonata for Solo Viola* op. 25/1. There can be little doubt that Hindemith's prolific activities as a performer had a direct influence on his early compositional techniques and materials. It is primarily for this reason that Hindemith's music from 1919-1922 was strongly based on octatonic principles – which has not been fully acknowledged in secondary literature – in addition to whole tone scales and more complex, and yet coherently conceived, pitch collections.

The *String Quartet* op. 22 demonstrates that in a contrapuntal context, Hindemith's pitch coherence applies to individual lines and to two-part counterpoint, but then breaks down in three or more voices, becoming fully chromatic when all parts are viewed collectively. The

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music of Hindemith, and that it would be a fascinating area for future study. See Tymoczko, Dmitri, 'Stravinsky and the Octatonic: a Reconsideration' *Music Theory Spectrum* Vol. 24, No. 1 (Spring, 2002) pp. 68-102.

tools that I have developed for analysing op. 25/1 are therefore primarily suited to horizontal, rather than vertical phrases in Hindemith's early string music of more than two parts, as the dense chromaticism masks the more specific contrapuntal devices which may be found by isolating each individual line. There may be potential in the earlier method, however, for analysing phrases not for the pitches that they contain, which often include cardinal values of ten to twelve pitches, but to identify those pitches that have been omitted or postponed.

Many of the elements of Hindemith's future compositional approach may therefore be found in his early music, although the stylistic and technical plurality, eccentric performance directions, and self-conscious references to the potpourri of dance forms in the 1920s, such as foxtrots and shimmies, were to become toned down in favour of a more systematic compositional approach based on the ideas formalised in the *Unterweisung*. Quartal collections consisting of fourths and fifths, such as pc-sets 3-9, 4-23, 5-35 and 6-32, were, however, a major element of his early style that remained, as did references to baroque forms such as fugato and passacaglia. Hindemith became less active as a public performer as he grew older, and demonstrated a growing impulse to be associated with the performance of older music, such as his connection to the Yale Collegium Musicum, which shows that he was subjected to fewer of the zeitgeist stylistic influences from his early days in Germany. While Hindemith was an original composer, his compositions were inherently affected by the music that he experienced around him.

## Chapter 5 *Ludus Tonalis*

### 5.1 Context

As a member of his composition class I remember well how he used to discuss with his advanced pupils certain acoustical phenomena about which he was writing in his book, and their melodic and harmonic implications. To corroborate further his theory of tonal organisation he composed the monumental 'Ludus Tonalis' for piano which has become one of his most famous works.<sup>153</sup>  
(Franz Reizenstein, 1964)

The *Ludus Tonalis*, written in 1942, has been described on several occasions as the quintessential model of Hindemith's music theory in practice, as not only was it written five years after the first published edition of the *Unterweisung*, but due to its proximity with *Unterweisung II* (1939), the second edition of *Unterweisung I* (1940) and *Craft I* (1942).<sup>154</sup> Furthermore, Hindemith had begun working towards *Unterweisung III*, even though the theoretical volume was never completed. While Hindemith wrote many other compositions during this time, such as three organ sonatas (1937-1940), eleven instrumental sonatas and the ballet *The Four Temperaments* (1938), none have the explicit reference to music theory found in the *Ludus*: where all twelve of the starting pitches for the fugues correspond to the ordering of Series 1. If Hindemith's early works show the composer at his most pluralistic, the *Ludus* presents the composer at his most cerebral. It provides the strongest indication of how Hindemith's music theory might be transferred into free composition, and lends itself well to a theoretical analysis.

The *Ludus* was finished two years after Hindemith's appointment at the Yale School of Music, and four years before he received American citizenship. It was also an enormously

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<sup>153</sup> Reizenstein, Franz, 'Paul Hindemith' *Essays on Music: an Anthology from The Listener* (London: Cassell, 1967) p. 133.

<sup>154</sup> Walden, Daniel, K. S., 'Noting Images: Understanding the Illustrated Manuscripts of Mendelssohn's *Schilffied* and Hindemith's *Ludus Tonalis*' *Music Theory Online* Vol. 16, No. 3 (August 2010) and Delaere, Mark, 'Analyzing Contrapuntal Music: Some Remarks on the Fugues from Hindemith's *Ludus Tonalis*' *HJb* Vol. 24 (Mainz: Schott & Co., 1995) pp. 66-86. The date of the *Ludus* in 1942 is close to the first edition of *Unterweisung I* (1937), *Unterweisung II* (1939, in English) and the second edition of *Unterweisung I* (1940).

popular work, quickly selling out and needing reprinting.<sup>155</sup> Such was the popularity of the work that it marked a watershed moment in Hindemith's life – the closing of his troubled chapter in Germany in the mid- to late-1930s, and the widespread acceptance of the refined compositional style in the *Ludus*, brought about by his intensive theoretical activity. The work is a unique example in the history of Western Music of the relationship between music theory and compositional practice. While for previous works, it is questionable whether Hindemith's theorising, or his composing, came first; with the *Ludus* it is absolutely clear. The theory came first.

This was Hindemith's last solo piano work, and one of his most popular. It culminated his engagement with keyboard fugue practice which may be found in the *Sonata for Two Pianos*, also composed in 1942, two unpublished fugues written during classroom teaching at Buffalo (May, 1940) and Tanglewood (July or August, 1940), and the *Third Piano Sonata* (1936).<sup>156</sup> There are many similarities to be found between the *Ludus* and these other fugues from this period, including quartal pitch collections and three-part textures. The *Ludus* was therefore the culmination of an engagement with fugue practice that peaked at the same time as his emigration to North America.

The central question that the following analysis asks of Hindemith's *Ludus* is: what are the guiding strategies to his music which prevent it from being freely chromatic, and how are these processes related to the *Unterweisung*? It also asks how this differs from, or is similar

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<sup>155</sup> Noss, Luther, *Paul Hindemith in the United States* (Urbana: University of Illinois Press, 1989) p. 118. The *Ludus* was one of Hindemith's best and quickest selling works, shifting 1200 copies in the first three months of its release in Germany. See Skelton, Geoffrey, *Selected Letters of Paul Hindemith* (New Haven: Yale University Press, 1995) p. 187.

<sup>156</sup> Only the very opening of the Buffalo fugue survives. It was copied down from the blackboard in haste by one of Hindemith's students in the early 1940s.

to, the pluralistic strategies of his earlier music. While it rests upon clear quartal collections legitimised by his music theory, the *Ludus* still contains elements of the earlier style, albeit it in smaller measure, including a restrained use of the octatonic scale in fugue ten in D $\flat$ , where the collection is utilised for its inversional properties.<sup>157</sup> There are also references to some of the pluralistic characteristics found in Hindemith's 1920s music, such as Ragtime (Interludium 3), Gigue (Fugue 5), Pastorale (Interludium 2), March (Interludium 6) and Waltz (Interludium 11).<sup>158</sup> However, the harmonic character within these pieces is distinctly more conservative.

In general, previous scholarship has assumed that there is a strong relationship between Hindemith's *Unterweisung* and the *Ludus* based on only two premises: that the starting pitches for each fugue follows the ordering of Series 1, and that the work was written in close proximity to Hindemith's main theory publications. There are, however, many more affinities to be found. This chapter performs a close examination of the Praeludium, Postludium, and several fugues from the *Ludus*, to demonstrate in greater detail the extent to which Hindemith's theory can be found in the music. It also questions the extent to which Hindemith's compositional style in this middle period is different to the earlier music of the 1920s.

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<sup>157</sup> Neumeyer, David, 'The Genesis and Structure of Hindemith's *Ludus Tonalis*' *HJb* Vol. 7 (Mainz: Schott & Co., 1978) pp. 72-103.

<sup>158</sup> Goebels, Franzpeter, 'Interpretationsaspekte zum *Ludus Tonalis*' *HJb* Vol. 2 (Mainz: Schott & Co., 1972) pp. 156-7. Goebels provides a character for each of the Interludiums as follows: 1. Improvisation 2. Pastorale 3. Moment Musical 4. Etüde 5. Intermezzo 6. Marcia 7. Trauermarsch 8. Capriccio 9. Elegie 10. Ostinato 11. Valse. In addition to these characterisations, Goebels also draws attention to the similarities between Interludium 3 and Schubert's *Moment Musical* in F Minor, Interludium 7 and Chopin's Sonata in B Minor, third movement, and Interludium 9 and Bach's Prelude in E Minor from Well-Tempered Clavier 1 [henceforth WTC 1].

The sketches for the *Ludus* will be referred to throughout this chapter, as they contain important information pertaining to Hindemith's compositional process.<sup>159</sup> The 91 pages are noteworthy for how they contain, in the majority of cases, no differences at all from the published version.<sup>160</sup> Accidentals are often spelt differently, however, which can result in the final version – which contains those accidentals that make it easiest to perform from – partly obscuring Hindemith's concept of tonal relationships. The most significant deviations from the published versions include a draft for the fourth fugue which was jettisoned entirely, and the eleventh fugue, which was drafted as a standard fugue before being rewritten as a two-part canon with accompaniment. Reference to the sketches also demonstrates that Hindemith often worked from a basic compositional skeleton, which was subsequently elaborated upon. This shows that Hindemith worked initially from a background structure in his music. Therefore, a reductive analysis can tell us much about what sort of structures Hindemith may have composed from during this stage in his compositional technique.

The order of the sketches implies that Hindemith originally conceived of a selection of three-part fugues, and that the idea of writing a large work which included interludes came later. In his autograph catalogue, Hindemith describes the work as *Kleine dreistimmige Fugen für Klavier*, and he had written to his publisher on 9 September, 1942 stating 'In addition there is a volume of light, genial and enjoyable three-part piano fugues.'<sup>161</sup> That Hindemith's fugues start in the order of Series 1 was not always the case, as he had at one stage planned to write them in ascending chromatic pitch order, which he subsequently crossed out, as

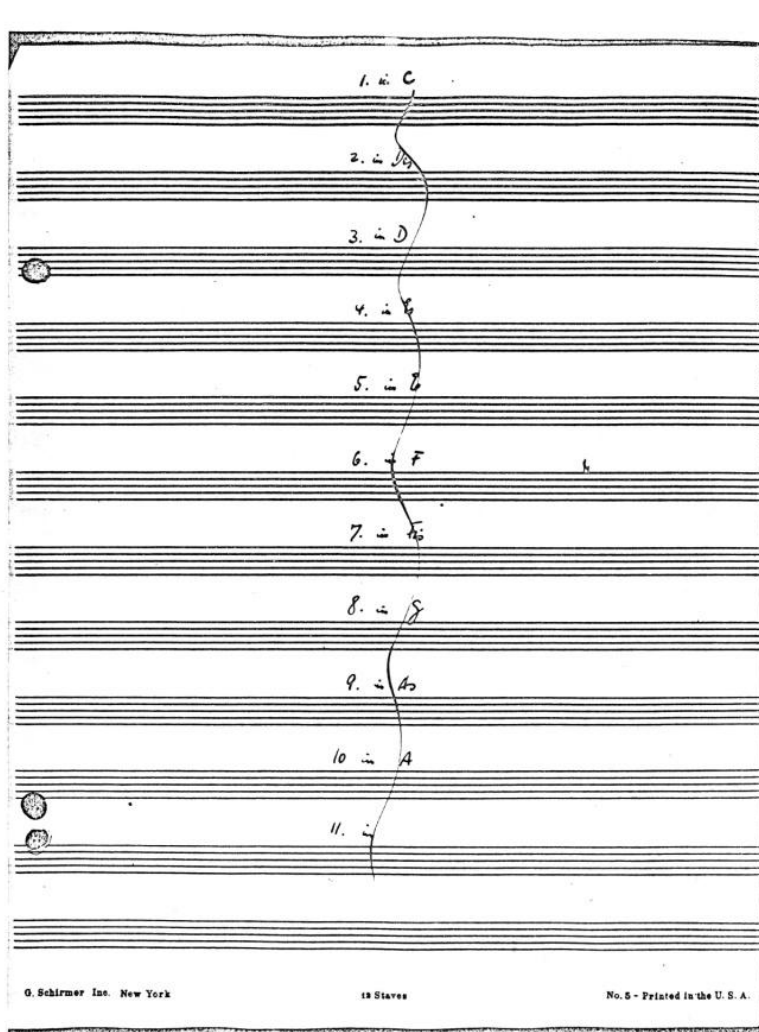
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<sup>159</sup> This chapter builds on Neumeyer's work on the *Ludus* sketches, published in 1978 and 1986.

<sup>160</sup> The original sketches are held in Frankfurt by the Hindemith Institute. A copy was also sent by David Neumeyer to the Yale Hindemith Collection in November 1975.

demonstrated in example 5.1. He also added short descriptions against several of the fugues, which denote the central concepts and techniques for each work:

- Fugue 1 in C: 3 Themen [3 themes]
- Fugue 2 in G: Engführung [stretto]
- Fugue 3 in F: Engführung Umkehrung [stretto inversion]
- Fugue 4 in A: 2 Themen [2 themes]
- Fugue 5 in E: Umkehrung [inversion]
- Fugue 6 in E<sub>b</sub>: Umkehrung [inversion]
- Fugue 9 in B<sub>b</sub>: Umkehrung Spiegelung, Spiegel, Umkehrung Vergrößerung [inversion, augmentation, mirroring]
- Fugue 10 in D<sub>b</sub>: Engführung Umkehrung [stretto inversion]
- Fugue 11 in B: Quintkanon [canon at the fifth]
- Fugue 12 in F<sub>#</sub>: Engführung [stretto]



Example 5.1: Hindemith's first sketch for the chromatic order of fugues in the *Ludus*.

## *Unterweisung* Strategies in the *Ludus Tonalis*

### 5.2 Series 1 Pitch Analysis

The two pillars of Hindemith's music theory are Series 1 and 2. Series 1 is a hierarchy of pitches relative to a fundamental, generating pitch. Each further pitch along the series, from left to right, possesses a progressively distant relationship to the fundamental. This relationship, expressed numerically in chapter three, is shown again in example 5.2 for convenience. This figure provides the normative model, which may be transposed to any of the twelve pitches of the chromatic scale, such as within one of Hindemith's 'modulations'. The concept of pitch 'distance' is central to Hindemith's theory and the numbering of Series 1 facilitates an understanding of how this may occur in free composition. The corresponding numbers are presented in square brackets, preceded by the labelling of the generating pitch, such as C: [0 4 1].



Example 5.2: Hindemith's Series 1, numbered.

When applied to the subject of the first fugue, the pitch distances may be measured as C: [1 0 8 6 e 2 9]. An inclusion of only the salient first beats of each bar provides C: [1 8 2]. This shows that the start and end points are nearest to the generating pitch (C), with a significant excursion away in the middle of the subject. These results parallel an intuitive analysis of much of Western Classical Music, whereby a work begins with a tonic, journeys away from it, and then returns.<sup>162</sup> Furthermore, this application of Series 1 can relate to all twelve pitches, which affords a more detailed analysis of chromatic movement within a linear

<sup>162</sup> This also conforms to Hindemith's *Unterweisung* 'practical application'. See *Craft* (1942) p. 158.

hierarchy than tonal analysis. The structural pitches of G, B $\flat$  and F in this example, when combined with the pitch centre of C in the first bar, form the Hindemithian pc-set 4-23. This shows that quartal pitch collections may be observed not only at the surface level, but at a deeper structural level.

The image displays two musical staves. The top staff shows a melodic line in treble clef with a long slur over six notes. Below the notes are the numbers 1, 0, 8, 6, e, 2, and 9. The bottom staff shows a treble clef with a box around the first three notes (1, 0, 8) and a slur over them. The number 2 is placed below the fourth note. Above the box is the label '4-23'.

Example 5.3: *Ludus*, fugue 1, first subject, bb. 1-3.

This procedure may be related to Hindemith's concept of degree progression, which is based on a similar premise of drawing attention to structural pitches. In Hindemith's own analysis of his *Mathis der Maler* Symphony, his degree progression outlines pitches that may be traced to a relationship between his Series 1, and the Hindemithian chords shown in example 5.4:

2 Paul Hindemith, *Mathis der Maler*, Prelude Complete Analysis

In rather fast half-notes

Ⓐ Melodic Analysis of the Upper Voice (the other moving parts can be dissected in similar fashion)

1 Degree-Progression

2 Step-Progression

Ⓑ Harmonic Analysis

3 Two-Voice Framework

4 Fluctuation

5 Degree-Progression

6 Tonality

\* The organ-point is disregarded in the analysis

6

7

8

9

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11

12

Example 5.4: The first two pages of Hindemith's analysis of his own *Mathis der Maler* Symphony, *Craft I* (1942) pp. 220-221.

A further relationship to Series 1 may be found in the pitch centres implied by each subject entry in the first fugue, which are as follows:

Bar	1	4	8	11	13	16	21	24	27	35
Pitch Centre	C	F	C	C	C	A	E $\flat$	A $\flat$	F	C
Series 1	0	2	0	0	0	3	5	6	2	0

This list of fugue entries shows that the fugue moves progressively further along Series 1, away from the fundamental pitch of C, towards a climax at bar 24. It then travels in the opposite direction back to C. It shows Series 1 operating at a further structural level, and may be found in subsequent fugues. For example, in Fugue no. 5, 82 bars long, the points of furthest distance from the pitch centre [E] are found in bb. 52-60 [F and D $\sharp$ ], approximately two-thirds through the work. Given Hindemith's meticulous attention to the large scale planning of musical works, these relationships are likely to have been a conscious decision.

### 5.3 Series 2 Contrapuntal and Harmonic Analysis

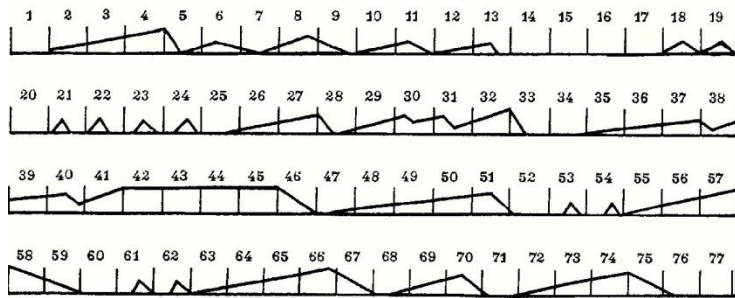
Hindemith's chord groupings are based on the interval hierarchies of Series 2. In his analyses of degree progression, Hindemith requires the analyst to find the 'best' or most consonant interval: in other words, the interval furthest to the left of Series 2. Once this is achieved, the root of this interval is chosen as the pitch for the degree progression. O'Connell (2011) doubts the usefulness of reducing a degree progression from a texture that includes more than two parts, and he suspects that this may have been one of the reasons for Hindemith's delay over the completion and publication of *Craft III*.<sup>163</sup>

Alongside his list of intervals, which are ordered according to the placement of their difference tones, Hindemith provides an approximate sketch of 'harmonic force' and 'melodic force'. As these do not correspond to one another, and do not change in alignment with the ordering of intervals, it is difficult to equate Hindemith's Series 2 with the same numbering as Series 1, to make it into a practical analytical tool.

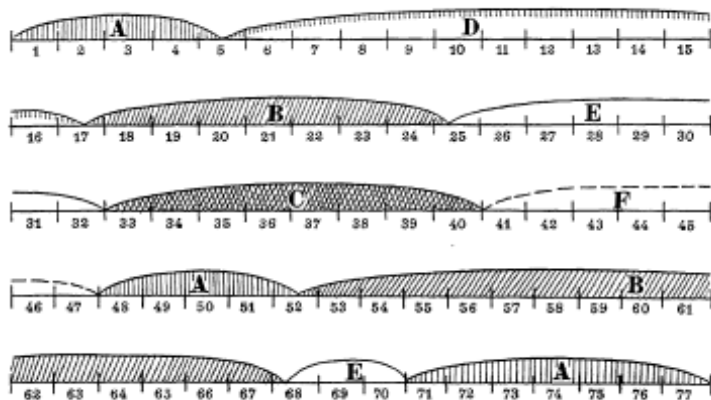
The value of Hindemith's Series 2 to the work presented here is to provide the basis of chord grouping, which may be identified with Hindemith's Roman numeral system. These afford an interpretation of harmonic fluctuation, which is a key layer in Hindemith's own music analyses included at the end of the *Unterweisung*. Hindemith's labelling of harmonic fluctuation is detailed, and yet also takes into consideration the prolongation of structural harmonies. In his second volume of *Traditional Harmony* (1949), Hindemith sketches a harmonic fluctuation plan for a compositional exercise, shown in example 5.5. He also discusses harmonic and structural plans, shown in examples 5.6 and 5.7.

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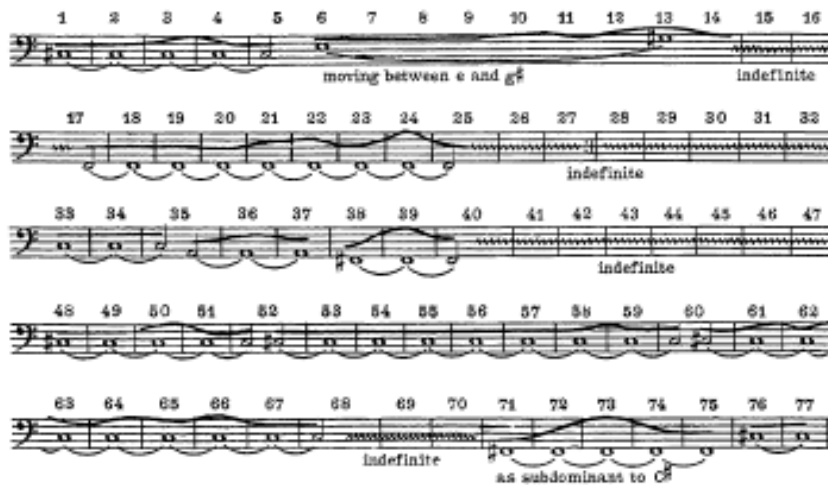
<sup>163</sup> O'Connell, Kevin, 'Hindemith's Voices' *The Musical Times* Vol. 152, No. 1915 (Summer, 2011) p. 4.



Example 5.5: Hindemith's harmonic fluctuation diagram from *Traditional Harmony* vol. 2 (1949) p. 42.



Example 5.6: Hindemith's discussion of form in *Traditional Harmony* vol. 2 (1949) p. 40.



Example 5.7: Hindemith's discussion of tonality in *Traditional Harmony II* (1949) p. 38.

While the size of the peaks and troughs in the plan are approximate, they show an aspect of how Hindemith's music theory relates to compositional practice. The chord 'values', derived

from the interval hierarchy of Series 2, are used strategically within a composition.

Hindemith instructs an approach to this:

In determining the fluctuation value of chords, one simply disregards the non-chord tones. Acquire the habit of carefully calculating harmonic fluctuation. Chords of high tension should not occur merely as the result of following the path of least resistance in the voice-leading; and a sudden relaxation of tension after progressions of chords of high tension is advisable only when one considers the resulting harmonic shock aesthetically justified.<sup>164</sup>

An analysis of the presence of chord fluctuation in Hindemith's *Ludus* is of limited value, given the imprecision of such diagrams. It is also unclear how best to apply harmonic fluctuation in the three voice contrapuntal setting of the twelve fugues, as Hindemith's guidelines published in *Craft III* do not necessarily represent his final views on the matter.<sup>165</sup>

However, there is a notable doubling of root pitches at structural points, which is related to Hindemith's derivation of chord roots via difference tones.<sup>166</sup> In Fugue 1, for example, there are eight bars that include pitch doubling on a strong beat, seven of which include the bass voice.<sup>167</sup> The pitches doubled are [C F B $\flat$  E $\flat$  E G] – with the exception of the E in bar 42, these pitches are related by the quartal set 5-35.

## 5.4 Exposition Structures and General Attitude towards Fugues

For a composer who wrote a vast number of works that included fugal techniques, it is surprising that Hindemith abhorred the conventional fugue layout, associated with the mature Baroque fugues of Bach and Handel, and the traditional school fugue that is taught today at undergraduate level.<sup>168</sup> His enjoyment of fugue technique was related not to a

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<sup>164</sup> *Traditional Harmony*, Vol. 2 (1949) p. 42.

<sup>165</sup> This is confirmed by Howard Boatwright in an unpublished text in the Yale Hindemith Collection entitled 'Hindemith's Series: a Critical Evaluation, and a New Formulation' (1959).

<sup>166</sup> The doubling of root pitches is observed in Delaere, Mark, 'Analyzing Contrapuntal Music: Some Remarks on the Fugues from Hindemith's *Ludus Tonalis*' *HJb* Vol. 24 (Mainz: Schott & Co., 1995) pp. 66-86.

<sup>167</sup> Non-salient doublings are those found on quaver off-beats.

<sup>168</sup> One of Hindemith's strongest statements against the school fugue is as follows: "These few examples cannot of course clear away the whole miserable collection of unmusical formulas the dreary and lifeless pasting

disposition of exposition, episode, middle entry and coda, but rather to the way in which fugue presented an opportunity to rigorously engage with the inventive possibilities of a small phrase of musical material. This attitude is epitomised in the *Ludus*, where Hindemith abstains from any overt reference to a standard fugue form, choosing instead to focus on the contrapuntal potential of his material. This potential is realised by two types of device: those which may be heard by the listener, including stretto, and those which are unlikely to be heard by anyone apart from the most expert of listeners, including retrograde and inversion, and which are found by analysing the score. Hindemith's use of these 'visual' contrapuntal techniques, while he may not have approved, invites comparison between the *Ludus* and J. S. Bach's *Art of Fugue*.

The visual dimension is further emphasised by the 1950 copy of the *Ludus*, presented by Hindemith to his wife Gertrud on her fiftieth birthday, which contains the addition of amusing cartoon sketches of animals. In particular, these emphasise the lion, as Gertrud was born under the astrological sign Leo.<sup>169</sup> This emphasis on visual compositional techniques, such as retrogrades and inversions, contrasts with Hindemith's early music, which was written to communicate more directly to this listener, without requiring theoretical knowledge of contrapuntal procedures. However, one cannot discount the possibility that Hindemith hoped that his listener would pick out some of his architectural procedures, particularly given his fearsome technique in aural training.<sup>170</sup>

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together of "expositions" and "episodes" of which the usual instruction in fugue consists.' *Traditional Harmony* Vol. 2 (1949) p. 54.

<sup>169</sup> Walden, Daniel, K. S., 'Noting Images: Understanding the Illustrated Manuscripts of Mendelssohn's *Schifflied* and Hindemith's *Ludus Tonalis*' *Music Theory Online* Vol. 16, No. 3 (August 2010)

<sup>170</sup> See chapter eight for further details of Hindemith's aural examinations.

Hindemith's attitude towards the starting pitch of the fugue answer was governed not by the tonic-dominant-tonic template of the Baroque, but by experimenting with the subject and its contrapuntal potential (which, when using quartal pitch collections, can be considerable).

This is recalled by J. R. Cowell:

In viewing all 12 fugues as a body, they represent to me and my student colleagues at Yale in those glorious years 1945-1948, the great professor demonstrating masterfully with his own product the great range of possibilities of contrapuntal writing and the fugue as a form. Hindemith taught the following things: the subject determines within itself what can be accomplished in a given fugue. Before proceeding past the subject, one must 'test' the subject to learn its possibilities for every kind of treatment: inversion, retrogression, stretto, what best interval is best for the answer, what kind of counterpoint will work best, etc. Hindemith said: "build up a fugue". An open possibility to Hindemith that was rarely considered possible by Bach and his contemporaries was the necessity of discovering the best possible interval of answer for the given subject, while, in his diatonic major-minor style, the 5<sup>th</sup> was the interval of answer for Bach 99% of the time. Hindemith's mixed-modal thematics call for other intervals of answer.<sup>171</sup>

Hindemith includes fugue answers in his expositions at the major third (once) perfect fourth (five times), perfect fifth (five times) and major sixth (once).<sup>172</sup> As these pitches are all at the beginning of Series 1 and Series 2, it is likely that this is a direct reference to the *Unterweisung*.<sup>173</sup> He also pioneers the **stretto exposition**. This occurs in an exposition where the answer appears before the initial subject has finished, in a manner similar to a stretto that one would expect later in the fugue, and examples include fugues 2 and 12.

Despite these innovative approaches to fugue form, and Hindemith's disregard for the 'school fugue', there are a number of conventional trends to be found in his writing. These include the presence of a final entry in the bass line in fugues 1, 2, and 7, as one would expect in the stereotypical fugue exercise. He also writes short transitional passages between the answer and the subsequent entry of the subject, which would normally be required to

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<sup>171</sup> Lee, Dong-Seon, 'A Structural Analysis and Performance Guideline of "Ludus Tonalis" by Paul Hindemith' (University of Washington, DMA, 1994) pp. 31-2.

<sup>172</sup> These are judged from the interval above the subject. Therefore, if the answer occurs a minor third below the subject, it is described here as a major sixth.

<sup>173</sup> In Series 1, these are the first five pitches, whereas a minor sixth exists before the major sixth in Series 2 – this may be understood as a conflicting element between the two hierarchies.

modulate from the key of the answer – usually in the dominant – and the third subject entry in the tonic. While the primary function of this transition is to modulate between keys, Hindemith uses a transition in seven of the twelve fugues from the *Ludus*, of either one or two complete bars in duration.<sup>174</sup> This shows that Hindemith still enjoyed the gesture of the transition within his expositions, even when it was not required to modulate from dominant back to tonic. Hindemith also alternates between what is understood in conventional diatonic terms as a real ( $\mathbf{A}^R$ ) and tonal ( $\mathbf{A}^T$ ) answer.

## 5.5 Pitch collections and Transformational Counterpoint

By the time that Hindemith had begun composing the *Ludus* in 1942, he had rationalised and refined his compositional style via the *Unterweisung*. One consequence of this was an increase in the use of quartal pitch collections, compared with fewer of his early, pluralistic collections such as the octatonic and whole tone scales, and jazz influences. Quartal pitch collections enabled Hindemith to perform a wide variety of retrograde and inversion operations on his material, offering a solution to writing counterpoint that was not strictly tonal, nor freely chromatic.

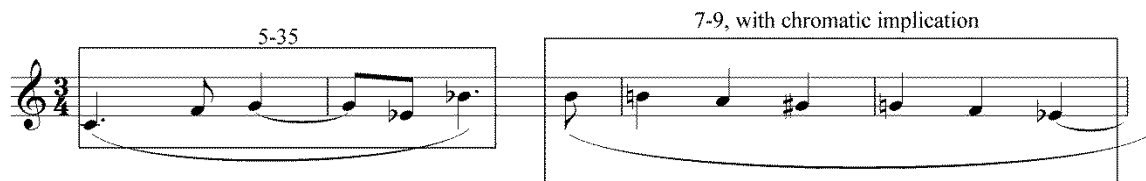
Every fugue from the *Ludus* is based on quartal pitch collections at both foreground and background structural levels. This parallels many of the fugue subjects from his middle period (c. 1933-1948), which adhere to four general pitch paradigms:

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<sup>174</sup> Transitions may be found in fugues 1 (1 bar), 4 (2 bars), 5 (1 bar), 6 (1 bar), 7 (1 bar), 9 (2 bars) and 10 (1 bar).

### ***Fugue Subject Paradigm 1***

The model begins with leaps that outline salient quartal pitch collections, followed by a contrasting second section based on a predominantly stepwise descent. This might also be the pitch class complement of the quartal pitch material. Other contrasting material in the second half can include diminished sevenths and tritones, which destabilise the earlier quartal collections. This may be found in the fugue subject from Hindemith's *Sonate für Geige und Klavier* (1939), and in fugues 2, 3, 5, 6 and 9 from the *Ludus*. It is therefore Hindemith's favoured approach to fugue subject construction.



Example 5.8: *Sonate für Geige und Klavier* (1939), third movement, bb. 1-4

### ***Fugue Subject Paradigm 2***

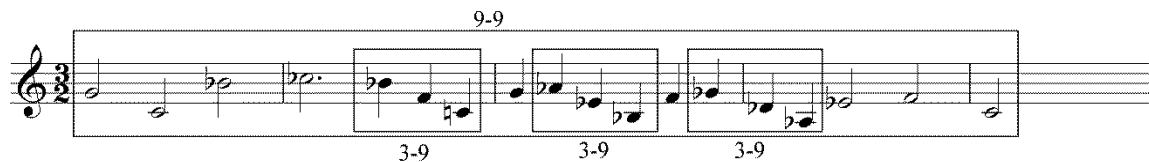
Hindemith will occasionally construct a fugue subject that is made entirely from a single quartal collection, with no foreign passing notes. In this paradigm, salience characteristics are unnecessary for pitch grouping, and need only be used for voice-leading hierarchy. While this may only be found in fugue 8 from the *Ludus*, it is also used in the fourth movement of the *Third Piano Sonata* (1936) and the fifth movement of the *Sonata for Two Pianos* (1942).

The classification of these subjects is often problematised by collections of high cardinality. A pitch collection of 7-35, for example, is identical to the diatonic scale. However, it is the ordering of these pitches which sets the collections apart from their diatonic equivalents.

In Paradigm 2 subjects, the complement is quartal.<sup>175</sup> Example 5.9 shows the subject to the *Third Piano Sonata*, comprising pc-set 8-23, which is complemented by 4-23. Example 5.10 shows the subject to the *Sonata for Two Pianos*, comprising pc-set 9-9, which is complemented by 3-9.



Example 5.9: Hindemith's *Third Piano Sonata*, fourth movement opening fugue subject.



Example 5.10: Hindemith's *Sonata for Two Pianos*, fifth movement opening fugue subject.

### ***Fugue Subject Paradigm 3***

Some of Hindemith's subjects make salient reference to quartal collections, and yet include a variety of 'foreign' notes, such as passing notes, that fill out the melody. Examples are fugues 1, 4, 7 and 10 in the *Ludus*.

### ***Fugue Subject Paradigm 4***

It is very rare that Hindemith does not refer to quartal pitch collections in the music from this period. The final category of fugue subject is reserved only for those subjects that have no quartal pitch collections. It is possible that this includes the final fugue, number 12, from the *Ludus*, although this is debateable.

<sup>175</sup> See also quartal set complements from chapter three.

## 5.6 Countersubjects

On the third page of Hindemith's sketchbook he describes his first fugue in C as containing three themes. This makes it a 'triple fugue', which is not to be confused with some fugue definitions that label a triple fugue as one which includes three voices. It has parallels in his other works: Hindemith writes a triple fugue in the opening of the first movement of the *String Quartet* op. 32 (1923) and the finale the *Septet* (1948).<sup>176</sup> As Hindemith avoids the standard, recurring fugue countersubject, a triple fugue offers the opportunity to still have material other than the initial subject that re-appears. The exposition to fugue 1 in C implies a baroque model, although rather than following a tonic-dominant-tonic procedure, Hindemith implies tonic-subdominant-tonic:

The image displays a musical score for Example 5.11: *Ludus* fugue 1, measures 1-6. The score is written in 4/4 time and consists of two systems. The first system shows the Subject (C) in the treble clef and the Answer (F) in the bass clef, with a 'Free Counterpoint' section in the bass clef. The second system shows the 'Transition' in the bass clef and the Subject (C) in the treble clef, with a 'Free Counterpoint' section in the bass clef.

Example 5.11: *Ludus* fugue 1, bb. 1-6.

The free counterpoint that accompanies the answer may be understood as deriving from the intervals of the subject.<sup>177</sup> This includes the opening fifth, the seventh (inverted to a second) followed by another second. Hindemith's free counterpoint retains many motivic similarities

<sup>176</sup> Discussed in Dorfman, Joseph, 'Hindemith's Fourth Quartet' *HJb* Vol. 7 (Mainz: Schott & Co., 1978) p. 54.

<sup>177</sup> Walden, Daniel, K. S., 'Noting Images: Understanding the Illustrated Manuscripts of Mendelssohn's *Schifflied* and Hindemith's *Ludus Tonalis*' *Music Theory Online* Vol. 16, No. 3 (August 2010).

to his subject material, and yet does not return in the same manner as a standard fugue countersubject. He continually reinvents and explores his material.

Fugues 5 and 8 contain notable strategies for fugue writing that do not involve countersubjects. In the fifth fugue, the free counterpoint that accompanies the subjects is of a very distinctive and sequential character, which would often be associated with a standard baroque countersubject. Hindemith's intellectual feat is to write sequences against nearly every appearance of the subject, while none of them are exactly the same. In other words, Hindemith seems to deliberately imply the character of a countersubject, without ever writing one. In fugue 8, perhaps due to the brevity of the subject, there are an exceptionally high number of subject entries. As there are no regular countersubjects, Hindemith writes a tremendous amount of free counterpoint to go with each subject entry – the intellectual feat is one of inventing a large quantity of small sections of counterpoint, none of which recur.

## 5.7 Modulation

In *Unterweisung I*, Hindemith describes modulation as 'when we allow one tone to usurp the place of another as tonal centre of a degree-progression'.<sup>178</sup> To analyse modulation in Hindemith's counterpoint, we therefore need to use his theory of chord roots to enable the analysis of a degree progression. This provides us with a method of establishing the pitch centre of the fugue subject, and subsequent zones within the piece, such as middle subject entries. Modulations occur within the piece not by means of diatonic cadences, but by the creation of a new fundamental pitch using three main devices: voice leading, salience, and the entry of a subject.

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<sup>178</sup> Translation taken from *Craft I* (1942) p. 149. This contradicts the observations of Vignal, Marc Hindemith, *2nd Sonata & Ludus Tonalis* [accompanying booklet to CD]; Richter, Sviatoslav (Pyramid Records, B000009IK2, 1995), which states that the *Ludus* does not use the practice of modulation.

As this approach to modulation is not strictly diatonic, it can be hard to hear when a pitch centre changes, particularly within quartal pitch collections. A strength of quartal collections is their rotational qualities, which allow all manner of inversions, retrogrades and strettos. However, this has the undesirable side effect of making the entire work settle in a similar harmonic area. In example 5.12, taken from Fugue 1, while the cadence clearly outlines a move to a pitch centre of E $\flat$ , the general aural impression of the counterpoint is one of sameness with the material before and after. The piece also remains in C for long periods, which adds to the aural impression of harmonic stasis. It is further notable for the lack of sequences, which are a strong feature of many of the later fugues in the cycle. The texture is relentless, as after the introduction of the three voices in the exposition, none of the voices are dropped throughout the work.

19

Modulation → E $\flat$

Example 5.12: Hindemith's *Ludus*, Fugue 1 in C, bb. 19-22.

## 5.8 Sequential Patterns

Hindemith's counterpoint from this period is neither tonal nor atonal. One of his favoured compositional strategies is to write lines that form sequences to create tension, and goal directed movement. In general, these sequences are formed in two parts within the three-part fugue texture. They may be identified using Hindemith's 'two-voice framework' and create linear intervallic patterns and compound melodies. The governing gesture of these sequences is very similar to that found in diatonic counterpoint, and yet it does not have the

same harmonic impulse. The following passage acts as an episode in between two middle entries within Fugue 5:

23

Example 5.13: Hindemith's *Ludus*, Fugue 5, bb. 23-28.

This example shows the regularity in Hindemith's sequence writing. In the synoptic tables that follow, I have identified any counterpoint that may be described as sequential with the superscript <sup>SEQ</sup>. This is used to demonstrate the proportion of Hindemith's free counterpoint within his fugue writing that is driven by sequences. When his harmonic language fails to produce strong goal-oriented direction, Hindemith resorts to sequences.

## 5.9 Quartal Pitch Collections

The use of quartal pitch collections may be observed on many levels in the *Ludus*, as demonstrated in the following analysis of sections from Fugues 5, 6, 7, 11 and 12.

Fugue 5 uses a Paradigm 1 subject in two sections. The opening four bars explicitly outline a chain of 4-23 tetrachords, which descend over the span of a tritone. This chain includes ten of the twelve pitches in the chromatic scale, omitting G $\flat$  and D $\flat$ . In the second half of the subject, these missing pitches are provided at the beginning of a chromatic passage which, in

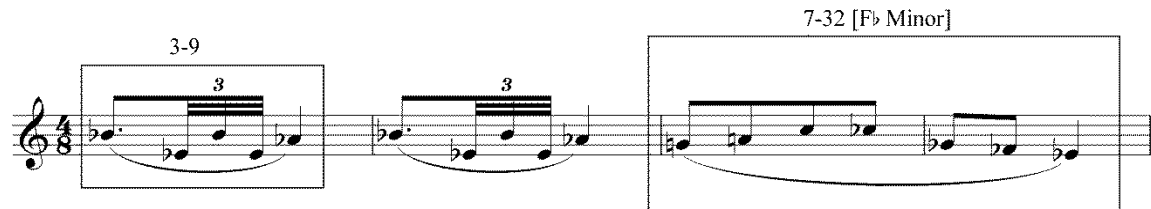
contrast to the opening half of the subject, omits D and G. The second section may be considered to be based on further quartal harmony, as the pitches create pc-set 6-32 with the omission of the C in bar five. However, this is more likely to be a version of the E $\flat$  minor scale, with the exception of the final two pitches in the subject that end the subject back in the tonic pitch centre of E $\flat$ . The subject is structured on quartal harmony on a foreground level – in the immediately audible sequence of 4-23 tetrachords in the first section – and on a background level, where the missing pitches of the first section [D $\flat$  G $\flat$ ] contrast with the missing pitches of the second section [D G]. It is therefore one of the most strongly representative fugues of Hindemith’s post-*Unterweisung* musical language. Perhaps as a result of this, only the subject itself may be found in the first book of sketches. It appears in a nearly final form in the second sketchbook, where there is only a small adjustment in the top voice of bar 16.

Example 5.14: *Ludus*, Fugue 5, subject analysis.

Similar to Fugue 5 in E, the sixth subject is Paradigm 1 and consists of two sections. The first section is characterised by explicit quartal harmony, and the second consists of stepwise motion resembling a minor scale. The opening is a characteristic reference to bells, not only in the distinctive rhythm, but also in the use of the 3-9 trichord. Large bells have some of the

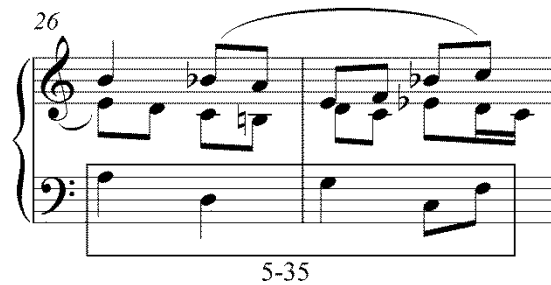
highest number of overtones to be heard, and it is therefore relevant that the theme consists of fourths and fifths – the most immediately audible area of the overtone spectrum.

The second section of the subject implies a move through F $\flat$  minor. While this also forms pc-set 7-32, a quartal collection, the voice leading implies a scale rather than collections of fourths and fifths.



Example 5.15: *Ludus*, Fugue 6, subject analysis.

The bass progression from bars 26-27, which accompanies part of the subject, both comprises the quartal pc-set 5-35 and implies a diatonic cycle of fifths. This counterpoint therefore exploits the ambiguity between the *Unterweisung*, quartal pitch collections, and the way in which the Western ear is conditioned to pick up on fifth bass progressions.



Example 5.16: *Ludus*, Fugue 6, bb. 26-27.

The seventh fugue is the simplest of the collection, and did not seem to give Hindemith many compositional problems, as there are no notable differences from his sketchbook. The subject is Paradigm 3, and implies B $\flat$  minor for the first two bars, while the descending fifth in bar three from D to G destabilises any sense of diatonicism. There are several structural

components to the subject: on a background level, it is based on the E $\flat$  major triad. On a middle level, it is formed from a 3-9 trichord followed by a 4-23 tetrachord.

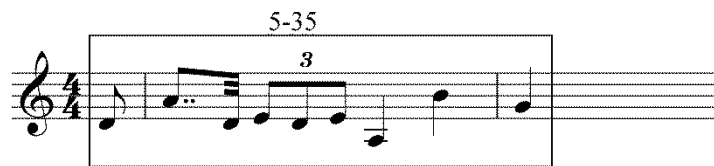
Example 5.17: *Ludus*, Fugue 7, subject analysis.

The episodic material from bars 14-22 is inverted to form the episode at bars 33-41. The inversion operation is made possible by the high concentration of both minor triads, and the quartal pitch collections 3-9 and 4-23 within the voice leading. In bar 16 the bass forms pc-set 4-23, while again feigning, as in fugue six, a cycle of fifths.

Example 5.18: *Ludus*, Fugue 7, bb. 14-17.

The eighth fugue subject is Paradigm 2: it is short in length, and every pitch conforms to the quartal pc-set 5-35. If the *Ludus* is the quintessential example of Hindemith's post-

*Unterweisung* style, then the subject from the eighth fugue is Hindemith's quintessential fugue subject. It avoids any conventional cadence that implies diatonicism, is based entirely on quartal material, and contains a distinctive ninth interval to disrupt conventional voice leading. As every note is included in 5-35, Hindemith could conceivably perform any operation of stretto, retrograde or inversion with identical harmonic results.



Example 5.19: *Ludus*, Fugue 8, subject analysis.

Because of this short subject, there is little opportunity for sequential counterpoint. This is compensated for in the episodes, which form sequences that outline the pentatonic and hexatonic pitch collection (5-35 and 6-32) related to the subject, such as bars 19-20:



Example 5.20: *Ludus*, Fugue 8, bb. 19-20.

Fugue 11 carries a misleading title, as this work is actually a canon. The canon is in two parts, found in the upper line, while the bass voice forms an accompaniment. The canon restarts a semitone lower in a second section from bar 12. The interval between the canonic entries is a fifth – the most stable after the octave in Series 2. The fugue subject is a Paradigm 3, and

consists of two 3-9 trichords a semitone apart. This material contrasts with the final passing note motion of the subject, which destabilises the modality of the pitch centre; while the subject clearly starts and ends in B, at no point is a major or minor modality implied, owing to the presence of C $\sharp$ 's.

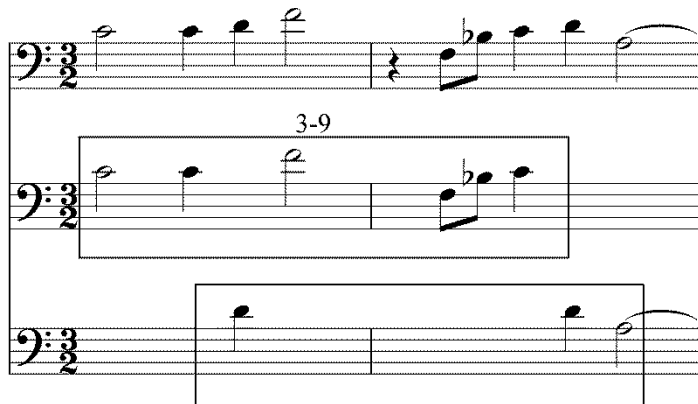
Example 5.21: *Ludus*, Fugue 11, subject analysis.

The final fugue uses the stretto exposition pioneered in Fugue 2. It is the most distant point in the cycle, as emphasised by the starting pitch of F $\sharp$ , and ending on an F $\sharp$  major triad. The Paradigm 3 subject is based on pc-set 5-35, apart from D and A which serve to destabilise the modality of F $\sharp$ , similar to the effect of C natural in the eleventh subject in B. On a background level, however, the subject outlines the F $\sharp$  major triad.

Example 5.22: *Ludus*, Fugue 12, subject analysis.

## 5.10 Issues for Segmentation

Not all pitch collections offer straightforward segmentation. For example, the fourth fugue subject presents a problem for both pitch grouping, and the definition of a pitch centre: a process which is necessary for a Series 1 analysis of the complete work. As the fugue is clearly in A, the subject must surely be in A, which is confirmed by the final entries from bars 73-76. However, it contains only an A on the final beat, and comprises the pc-set 5-27, the normal form of which is [A B $\flat$  C D F]. This implies a tonality closer to F than A, and Hindemith toys with this idea in the beginning of the third fugue section at bar 45, where the subject, in A, is accompanied by the fugue subject from the second section beginning with a prominent F in the bass.



Example 5.23: *Ludus*, Fugue 4 in A, bb. 1-2, subject analysis.

Defining a pitch centre is further problematised by the inversion of the subject. It first appears in bar 9, over an A pedal in the bass voice. This should make it clear that the inversion of the subject retains the pitch centre of A, and yet the pitches that defined this centre in the first version of the subject do not function in the same way. Hindemith used difference tones in Series 2 to 'prove' that intervals were invertible. On this basis, while the

melodic contours of the inverted subject obscure the pitch centre, it maintains the equivalent pitch centre to its original inversion.

Example 5.24: *Ludus*, Fugue 4 in A, bb. 9-10, subject inversion.

In the third fugue section of number 4, Hindemith combines the subjects from sections one and two. However, the subjects appear simultaneously and yet with different pitch centres. This raises the debate as to whether this section is bitonal – and thus a continuation of one of Hindemith’s earlier, and controversial compositional practices. He also uses two pedal points at bars 10-12 and 53-55, which accompany a subject with a different pitch centre.

Fugue 6 further complicates the issue of determining the pitch centre of the subject when under inversion, as encountered in Fugue 3. The voice leading of the original subject shows the pitch centre of E $\flat$  to be at the bottom of the triplet fifth motif, and part of the pc-set 3-9. When this is inverted, it is not clear whether the pitch centre should remain as the root of this fifth motif, even though it is upside down. In this instance, the root may be determined by observing that the three pitches can be arranged into a single chain of ascending fourths. In the original version, the root of the subject was in the centre of the two fourth intervals. Applying the same operation to the inversion shows that, in the example below, the root is A $\flat$  rather than D $\flat$ .

Original

Inversion

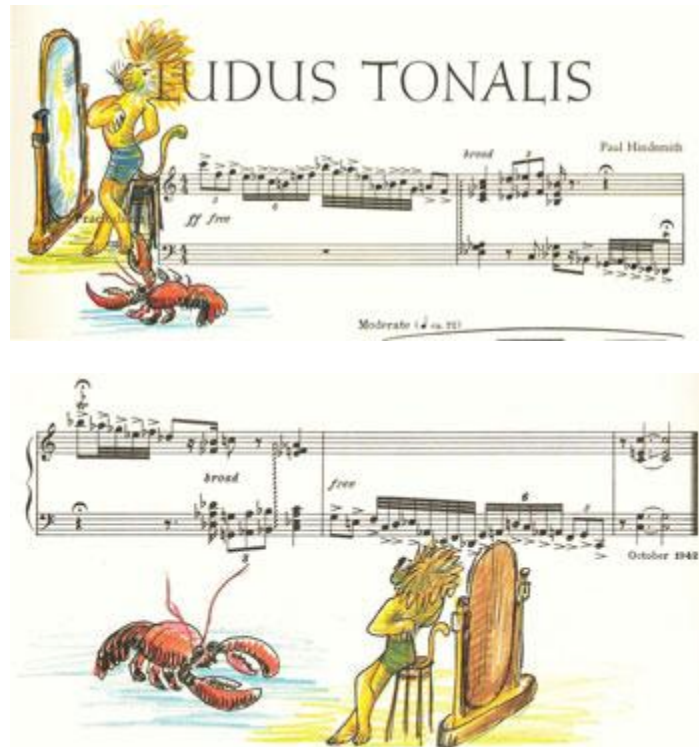
The image displays two musical staves side-by-side. The left staff is labeled 'Original' and the right staff is labeled 'Inversion'. Both staves show a treble clef on the top line and a bass clef on the bottom line. The key signature has one flat (B-flat). The top staff of each pair contains a melodic line with a bracketed triplet of eighth notes. Above this triplet, the interval '3-9' is indicated. The bottom staff of each pair contains a bass line with a chordal accompaniment.

Example 5.25: *Ludus*, Fugue 6, comparison between subject and inversion.

## 5.11 Larger Structural Relationships

The architecture for each fugue follows explicit designs, particularly according to Series 1 ‘distance’. For example, Fugue 4 consists of three separate fugue sections. It is characterised by the interval of a major third, which defines the subject, general counterpoint, sequences and structural relationships. The three fugue sections follow the pattern [A C# A], and the exposition to the first fugue section also follows the pattern [A C# A]. In fugue 12, a Series 1 analysis shows that in each of the three middle strettos, Hindemith moves one step to the left of the Series. Unsurprisingly, several of the entries are a considerable distance from the pitch centre [F#], although not a single entry, either here or in a previous fugue, occurs at the maximum distance along Series 1.

In addition to the relationships that govern each fugue, the complete cycle has an explicit structure. The twelve fugues, each separated by Interludiums, are placed in between a Praeludium and Postludium. The Postludium is an exact retrograde inversion of the Praeludium, as if it had been placed both upside down and in a mirror. Hindemith illustrates this effect in his 1950 edition of the *Ludus*, a birthday gift to his wife, Gertrud:



Example 5.26: The illustrated Præludium/ Postludium pair from the 1950 edition of the *Ludus*.

Neumeyer (1986) has demonstrated Hindemith's use of scales that allow a retrograde inversion, and his analysis of the *Ludus* sketches concludes that Hindemith experimented at length to find contrapuntal combinations that would produce satisfying results when transformed at 180 degrees. He also shows that Hindemith must have worked on the two pieces simultaneously, rather than one followed by the other. He states that 'it would be incorrect, however, to regard the Præludium as containing the Series 1 sequence in microcosm', referring to the move from C – F# throughout the piece. While there is no immediate ordering of Series 1 pitches as a structural force in the movement, it is a missed opportunity not to observe the presence of the *Unterweisung* on a foreground level.

The very opening of the *Ludus* is a 'play' on Series 1. The first three pitches consist of the first three notes of the series, followed by a passage that runs through all of the remaining

itches, saving the A [3] until the final beat. The tritone F# [e] is reserved for the final beat of bar two, where it forms the beginning of a descent back to the pitch centre of C. As the tritone is a governing force for the entire cycle, and for Series 1, the final beat of bar two may be understood as a microcosmic reference.

Having such a close connection to Series 1, the pitches outline a number of quartal collections, including the three quavers on the first beat (3-9). These collections are perfect for inversion and retrograde, as the fourth and fifth, when inverted, retain similar characters. These sets therefore have the double advantage of being a clear reference to Series 1, and creating a satisfying aural outcome when rotated 180 degrees.

Example 5.27: *Ludus*, Praeludium analysis bb. 1-3.

The inversional retrograde relationship between the Praeludium and Postludium is unique in the history of contrapuntal manipulation in the twentieth century. It ‘works’ because the two pillars of Hindemith’s contrapuntal theory – pitch collections and structural intervals – readily invite retrogrades and inversions.

Hindemith had experimented with large scale repetition in an earlier one act opera, *Hin und zurück* ('There and Back', 1927). The dramatic narrative of the opera is palindromic: the opening half of the opera, ending in tragedy, is played backwards in the second half, to produce a happy ending. While this involves the inversion of the narrative rather than the music itself, and does not attempt the ambitious retrograde inversion between the Praeludium and Postludium, it is evidence that Hindemith had worked with eccentric form structures as early as 1927, the year of his appointment to the Berlin Hochschule für Musik. Below is a brief summary of the opera, to demonstrate the action retrograde:

**Action synopsis:**

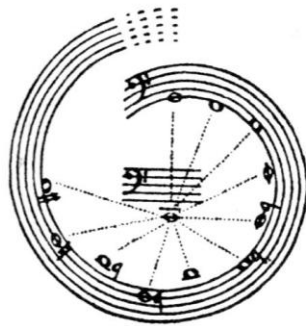
Aunt sits at a table, knitting.  
 Helene enters and joins her for breakfast.  
 Robert, her husband enters and wishes Helene happy birthday.  
 Maid enters with a note, which Robert discovers is evidence of Helene having an affair.  
 Robert shoots Helene dead.  
 A bearded sage appears to reverse fate.  
 Helene gets up, Robert puts his pistol back in his pocket.  
 Maid enters with a note, which Robert discovers is evidence of Helene having an affair.  
 Robert, her husband enters and wishes Helene happy birthday.  
 Helene enters and joins her for breakfast.  
 Aunt sits at a table, knitting.

Example 5.28 is a complete background reduction of the *Ludus*. It is almost identical to a standard Series 1 layout, with the addition of a final C to represent the closure of the Postludium, and the end of the seventh fugue in A<sub>b</sub>, which cadences on C.



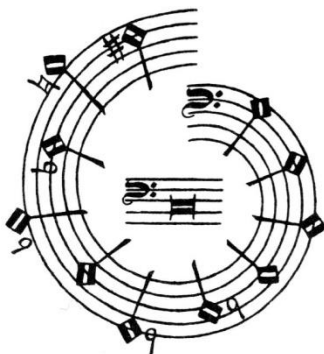
Example 5.28: *Ludus*, complete structural design.

Series 1 is, in many ways, circular. This is illustrated by Hindemith in *Craft II* as the following pattern:



Example 5.29: Series 1, taken from *Craft II* (1939) p. 91.

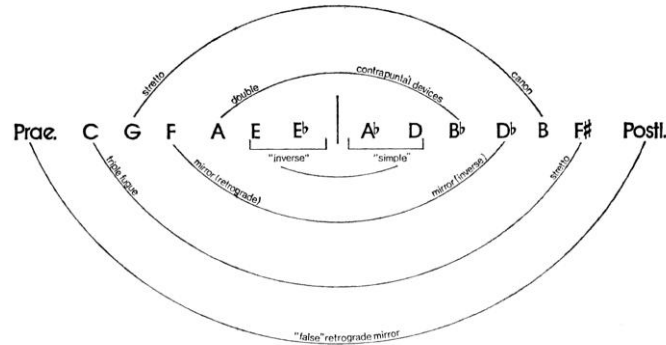
*Craft II* was published in 1939, which shows that Hindemith was aware of the cyclic properties of his music theory several years before writing the *Ludus*. Moreover, this circular illustration is useful for expressing the hierarchy of the series, and relates to the overall structure of the *Ludus*. An almost identical diagram is to be found in the inside cover of the published version of the *Ludus* (Schott & Co., 1943), with the note heads replaced by more archaic designs which draw further comparisons between the cycle and older musical forms.



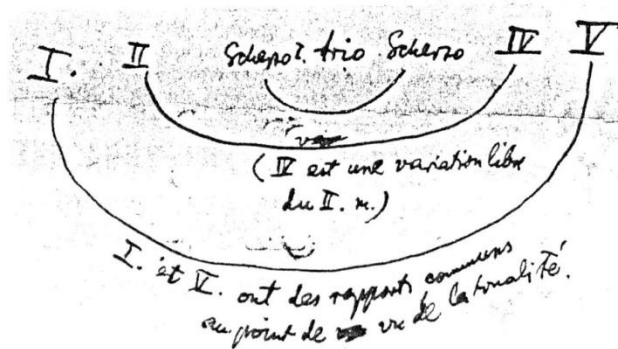
Example 5.30: Front page of the *Ludus* (Mainz: Schott & Co., 1943).

Neumeyer (1995) offers a concentric structure for the understanding of the complete *Ludus* cycle, shown in example 5.31. A large cyclic design such as this was not new, however, and a similar illustration may be found in the sketches of Bartók for his *Fifth String Quartet* (1934). While we cannot prove that Hindemith knew the work, as he had ceased his activities with

the Rebner and Amar Quartets, it is nonetheless fascinating to observe this coincidental concern between Bartók and Hindemith with cyclic form structures.



Example 5.31: Neumeier (1995) p. 75, example of the circular structure of the *Ludus*.



Example 5.32: Somfai, Lázló, *Béla Bartók: Composition, Concepts and Autograph Sources* (Berkeley: University of California Press, 1996) p. 20, ‘Symmetrical 5-movement form of String Quartet no. 5, Bartók’s drawing (BBA 3906)’.

## Three Case Studies for *Unterweisung*-based Fugues

### 5.12 Fugue 2 in G

The following short case studies analyse in closer detail the Fugues 2, 3 and 9 as particularly strong examples of *Unterweisung* practice, within the context of the complete cycle.

Fugue 2 is one of the most rhythmically arresting and popular works from the *Ludus*. It is the first to include the stretto exposition, which immediately creates an uncertainty over the

length of the subject, blurs the boundaries of subject and countersubject, and destabilises the relationship of subject and answer. The piece may be analysed at almost every level for Series 1 relationships: the pitch collections of the fugue, the episodes, and the structural architecture.

The fugue refers strongly to the pc-sets 3-9 and 4-23. In the exposition, the starting pitches are G, C and D, forming 3-9, which, similar to the first fugue, runs contrary to conventional fugue exposition structure. The subject refers to quartal sets on several structural levels. Bars one and two form pc-set 4-23, while a reductive analysis of salient pitches shows the entire structure of the subject to be based on the ascending and descending pentatonic scale, 5-35. As the subject begins with clear quartal pitches, contrasted by a more chromatic second zone, it is classed as Paradigm 1.

4-23

0      2 1 0 2 8      6 1 8 2 5 7 9 2 0

5-35

Example 5.33: *Ludus*, Fugue 2, subject, bb. 1-5.

Unlike Fugue 1, much of the episodic material is based on sequences. This may be one reason for the popularity of the work, as the sequences heighten the sense of forward motion and expectation. These sequences are formed through linear intervallic patterns, although Hindemith's counterpoint often gives the impression of a complete sequence, when he actually subtly alters the progression, such as bars 28-34:

29

4 7 7 6 6 3 | 7 9 8 8 10 7  
4 4 4 4 4 4 | 7 7 8 8 10 3

Example 5.34: *Ludus*, Fugue 2 in G, bb. 29-33.

This then reappears in a different disposition from bars 40-45, the first half of which contains a two-part linear intervallic pattern around a  $D_b$  pedal. This is followed by a second section that continues the linear descent, and yet does not provide a pure sequence. However, it shows a similar approach to inverting the counterpoint, shown by the arrow markings.

40

7 7 8 8 9 9 | 4 4 5 5 7 7  
4 4 4 4 4 4 | 2 1 1 1 1 1

Example 5.35: *Ludus*, Fugue 2 in G, bb. 40-45.

A Series 1 structural analysis of each subject entry shows that the points of greatest tension are stretto entries three and four. The opening 18 bars of the piece remain close to the overall pitch centre (G), as the emphasis is on the rhythmic character of the subject. This is outlined in the following synoptic table.

	Stretto Exposition			Stretto 2		19-23	Stretto 3	29-35	Stretto 4
	1-	-11	12-	-18	19-23	24-28	29-35	36-39	
	-	<b>S</b>	FC	S	ESEQ	<b>S</b>	ESEQ	<b>S</b>	
	-	<b>A<sup>R</sup></b>	FC	<b>FC</b>	ESEQ	<b>S</b>	ESEQ	<b>S</b>	
	<b>S</b>	FC	FC	<b>S</b>	ESEQ	<b>S</b>	ESEQ	<b>S</b>	
Pitch Centre	<b>G</b>	<b>C</b>	<b>D</b>	<b>C</b>	<b>G</b>	<b>E-F#-A</b>		<b>B<sub>b</sub>-C-E<sub>b</sub></b>	
Series 1 (G)	<b>0</b>	<b>2</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>3-t-7</b>		<b>5-2-6</b>	
	40-46	47-53	54-65	66-75					
	ESEQ	ESEQ	<b>S</b>						
	ESEQ	ESEQ	<b>S</b>						
	ESEQ	ESEQ	<b>S</b>						
Pitch Centre			<b>C-F-B<sub>b</sub>-C-D</b>						
Series 1 (G)			<b>2-8-5-2-1</b>						

Table 5.1: Fugal synopsis of *Ludus*, Fugue 2 in G.

- S = Subject
- A<sup>R</sup> = Answer
- CS = Countersubject
- FC = Free Counterpoint
- TR = Transition
- IE = Incomplete entry

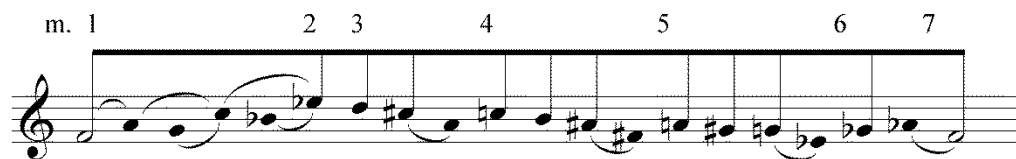
### 5.13 Fugue 3 in F

This is the only fugue to proceed from an Interludium that does not end on an implied dominant or tonic, as the previous movement both begins and ends on G, which makes the second Interludium one of the few stand-alone non-fugue works in the entire cycle. The subject is distinguished by its use of eleven different pitches, with the exception of E $\sharp$ . While the pitch centre of F is explicit from the beginning and final notes of the subject, Hindemith avoids any possible use of diatonicism by the omission of E $\sharp$ , which would be expected to function as a leading note. The subject belongs to Paradigm 1, due to the strong reference to quartal pitch material in bar two (pc-set 4-23) followed by a predominately stepwise descent from bars three to seven. The descent outlines both a chromatic line from E $\flat$  in bar two to F in bar seven, and a chain of three tritones in bars three to five. The subject has been subjected, by Morgan (1992), to one of the few voice leading reductions of the fugues from the *Ludus*.<sup>179</sup> His reduction is included below for comparative purposes. He chooses to emphasis the chromatic descent, although without noting the tritone pattern in bars three to five.

The image displays two staves of musical notation in 4/4 time. The top staff shows the original subject of Fugue 3 in F, starting with a quarter rest followed by a half note G4, then a quarter note A4, a quarter note B4, and a quarter note C5. From bar 2, it descends: B4 (quarter), A4 (quarter), G4 (quarter), F4 (quarter), E4 (quarter), D4 (quarter), C4 (quarter), B3 (quarter), A3 (quarter), G3 (quarter), F3 (quarter). A box labeled '4-23' encompasses the first four notes of the descent (B4, A4, G4, F4). A larger box labeled '7-35' encompasses the entire subject. The bottom staff shows a voice leading reduction of the subject, where the notes are connected by lines indicating voice leading. The notes are: G4 (quarter), A4 (quarter), B4 (quarter), C5 (quarter), B4 (quarter), A4 (quarter), G4 (quarter), F4 (quarter), E4 (quarter), D4 (quarter), C4 (quarter), B3 (quarter), A3 (quarter), G3 (quarter), F3 (quarter). The reduction emphasizes the chromatic descent from B4 to F3.

Example 5.36: *Ludus*, Fugue 3, subject analysis.

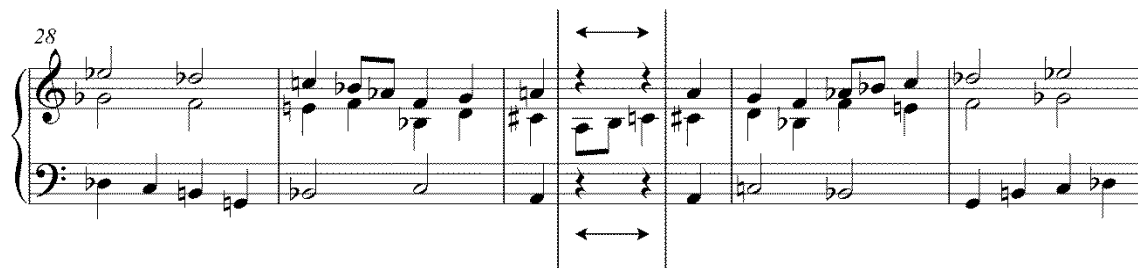
<sup>179</sup> Morgan, Robert P., *Anthology of Twentieth-Century Music* (New York: W. W. Norton & Co., 1992) p. 253.



Example 5.37: Morgan’s 1992 analysis of the subject from Fugue 3.

The character of the subject has been compared to the American Ragtime or Cool Jazz, perhaps as a result of the salient E $\flat$  in bar two, which is both syncopated and implies a seventh chord.<sup>180</sup> It contains an inner symmetry which is further represented by the symmetry of the fugue as a whole.

Hindemith labels this fugue as ‘stretto inversion’ in his sketches. This does not quite do justice to his remarkable compositional achievement in this piece, as the complete fugue is symmetrical around bar 30 in the top voice. In the bottom voice, the music is symmetrical from bars 7-53 and the middle voice from bars 13-47 – the sum of both sets of bar numbers equals the total length of the movement, creating perfect symmetry. This has the added effect of creating an illusion of returning countersubjects.



Example 5.38: *Ludus*, Fugue 3 in F, bb. 28-32.

Hindemith has to plan the structure of his fugue subjects carefully to stay sensitive to Series 1, as the retrograde structure reflects his pacing of tension. For example, any distant subject entries along Series 1 would recur at the equivalent point in the second section of the piece.

<sup>180</sup> Lee, Dong-Seon, ‘A Structural Analysis and Performance Guideline of “Ludus Tonalis” by Paul Hindemith’ (University of Washington, DMA, 1994) p. 51. This association is made in a quotation from John R. Cowell.

Perhaps for this reason, Hindemith remains conservative, relative to the other fugues, in the tension of his subject entries. Synoptic table 5.2 shows that the greatest distance is a major third from the overall pitch centre, which occurs immediately before and after the mirror at bar 30.

Hindemith adds new material to the lower two voices from bars 48 and 54 to sustain the texture. The counterpoint in the bass at bar 54 is strongly reminiscent of the bass motif from the Praeludium, and points to the possibility that other subtle references are made throughout the fugues to the opening and closing Praeludium/ Postludium pair, adding further thematic cohesion to the cycle.

54

Implied Eb Minor

Example 5.39: *Ludus*, Fugue 3 in F, bb. 54-55, bass motif.

33

Bass Motif

Example 5.40: *Ludus*, Praeludium bb. 33-36.

In the sketches, Hindemith experimented with a different version of bars 38-41, in both original and retrograde forms (ex. 5.41 and 5.42). He chooses to introduce the third voice two crotchet beats earlier in a 3-10 trichord, which may be understood as an incomplete seventh chord. In the final version Hindemith replaces this sonority with a 3-7 trichord: which is a closely related subset of the quartal tetrachord 4-23. This amendment therefore provides further evidence of Hindemith's preference for quartal pitch collections.

The progression of the lowest voice in the final version has also been adjusted to form a nearly complete descending chromatic progression, from F in bar 19 to A in bars 22-23. The only missing pitch is D $\flat$ , which would be expected in bar 21. In the earlier draft, Hindemith's descending progression begins later, in the third bar of the sketch (which one may assume corresponds to bar 21 in the final version), and does not include the pitches D $\flat$ , C or B in the descent from F to A. Hindemith's modification for the final version creates a closer relationship between this voice and the subject, the second half of which is also formed around a chromatic descent.

**Final Version**

**Draft**

Example 5.41: the final version of bb. 19-22 followed by the draft. The boxed section is nearly illegible in the sketch.

**Final Version**

38

**Draft**

Example 5.42: the final version of bb. 38-41 (a retrograde of bb. 19-22) followed by the draft. The boxed section is nearly illegible in the sketch.

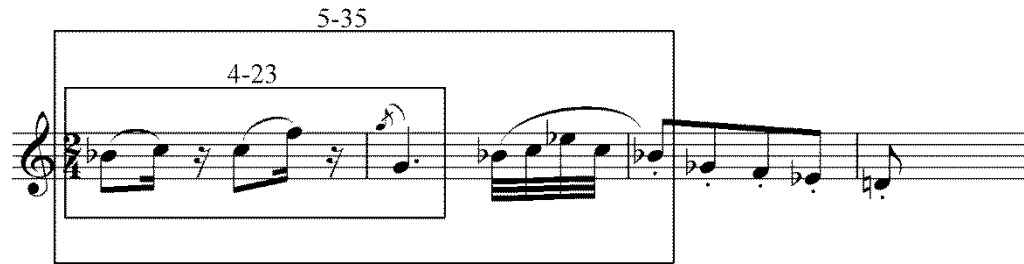
	Exposition										
	1-6	7-12	13-18	19-23	24-29	30	31-36	37-41	42-47	48-53	54-59
	<b>S</b>	FC	FC	E1				E1	FC	FC	<b>S</b>
	-	-	<b>S</b>	E1				E1	<b>S</b>	FC	FC
	-	<b>A<sup>R</sup></b>	FC	E1	<b>S</b>		<b>S</b>	E1	FC	<b>S</b>	<b>Z</b>
Pitch Centre	<b>F</b>	<b>D</b>	<b>F</b>	<b>F</b> → <b>A</b>			<b>A</b> → <b>F</b>	<b>F</b>	<b>F</b>	<b>D</b>	<b>F</b>
Series 1 (F)	<b>0</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>4</b>		<b>4</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>0</b>

Table 5.2: Fugal synopsis of *Ludus*, Fugue 3 in F.

- S = Subject
- A<sup>R</sup> = Real Answer
- CS = Countersubject
- FC = Free Counterpoint
- TR = Transition
- IE = Incomplete entry
- Z = motif from Praeludium/ Postludium

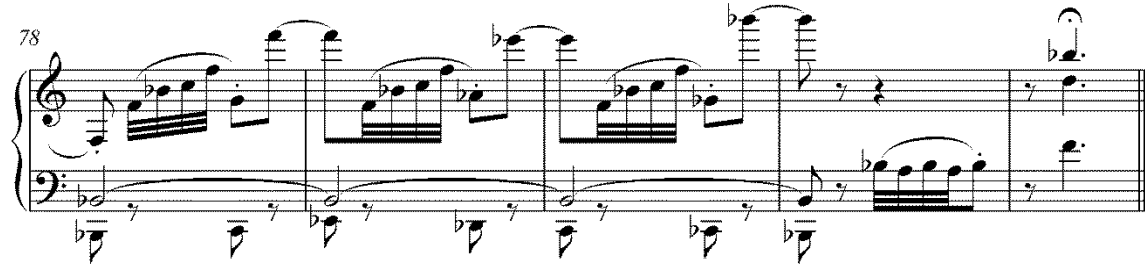
### 5.14 Fugue 9 in B $\flat$

The ninth fugue is remarkable, even within the context of the complete cycle, and shows the full potential of Hindemith's system. He includes perhaps the most complicated fugue device in Western Music: the retrograde inversion stretto, shown in synoptic table 5.3. It would be all but impossible to include such a device in diatonic music, unless one was to use a rudimentary subject, which would render the process superficial. Hindemith, perhaps deliberately, writes a fugue subject that is angular and distinctive. The opening bar contains the 4-23 tetrachord, which forms the subset 5-35 with the second bar. As a Paradigm 1 subject, it begins with clear use of quartal pitch material, contrasting with a scale descent in the second half. It is the uses of these pitch collections that opens up the array of transformational operations to Hindemith.



Example 5.43: *Ludus*, Fugue 9, subject analysis.

Similar to the explicit bell reference in the sixth fugue, Hindemith refers to pastoral, extra-musical material in the ninth fugue. The falling grace note and demisemiquaver rhythm of the subject evokes this character, which is then written with double octave displacements in the high register of the codetta, suggestive of string writing, particularly when combined with legato-staccato articulation:



Example 5.44: *Ludus*, Fugue 9, codetta bb. 78-82.

A Series 1 analysis shows that Hindemith was conservative in this fugue, and remained close at all times to the pitch centre of B $\flat$ . This may have been to not detract from the focus of his complex contrapuntal operations. Given that large sections of the fugue are in retrograde, as in Fugue 3, it is also necessary, as the alternative would mean a disproportionate section of the piece in a distant relationship with B $\flat$ .

In his sketches, Hindemith writes out one version of free counterpoint underneath the first entry of the fugue, which is not used until bar 66 in the final version. This shows that Hindemith planned the relationship of the fugue subject to this motif from the outset. The sketches are otherwise identical to the final version apart from bars 43-44, which, cryptically, Hindemith leaves blank in the top voice. I believe that this may have been to write in a reference to the Praeludium/Postludium, which had not yet been written, as both contain three notes forming the 3-9 trichord. Example 5.45 shows these missing bars, and outlines their structural pattern: they are also closely related to the material used in the codetta.

42

Omitted from the sketch

4-23

3-9

Example 5.45: the missing bars from Hindemith's sketch of Fugue 9.

								Stretto			
1-3	4-6	7-8	9-11	12-16	16-19	19-21	22-24	25-28	29-33	34-37	38-41
-	<b>A<sup>R</sup></b>	TR <sup>SEQ</sup>	FC <sup>SEQ</sup>	E	FC	FC	E <sup>SEQ</sup>	<b>S</b>	SRETTO	STRETTO OF	
<b>S</b>	FC	TR	FC	E	-	<b>S<sup>INV</sup></b>	E <sup>SEQ</sup>	FC		RETROGRADE	
-	-	-	<b>S</b>	E	<b>S<sup>INV</sup></b>	FC	E <sup>SEQ</sup>	<b>S<sup>INV</sup></b>			
Pitch Centre	<b>B<sub>♭</sub></b>	<b>F</b>		<b>B<sub>♭</sub></b>				<b>G</b>			
Series 1 ( <b>B<sub>♭</sub></b> )	<b>0</b>	<b>1</b>		<b>0</b>				<b>3</b>			

Retrograde Inversion Stretto				Augmentation and Inversion Stretto			
42-45	46-54	55-65	66-68	69-71	72-73	74-77	78-82
E <sup>SEQ</sup>	<b>S<sup>RETROINV</sup></b>	<b>S<sup>AUG</sup></b>	-	<b>S</b>	FC <sup>SEQ</sup>	FC	Codetta
E <sup>SEQ</sup>	<b>S<sup>RETROINV</sup></b>	<b>S; S<sup>INV</sup></b>	<b>S</b>	-	-	Z	Codetta; B <sub>♭</sub> PED
E <sup>SEQ</sup>	<b>S<sup>RETROINV</sup></b>	<b>S<sup>AUG</sup></b>	FC	FC	FC <sup>SEQ</sup>	<b>S</b>	Codetta
Pitch Centre			<b>B<sub>♭</sub></b>	<b>F</b>		<b>B<sub>♭</sub></b>	<b>B<sub>♭</sub></b>
Series 1 ( <b>B<sub>♭</sub></b> )			<b>0</b>	<b>1</b>		<b>0</b>	<b>0</b>

Table 5.3: Fugal synopsis of Hindemith's *Ludus Tonalis*, Fugue 9 in B<sub>♭</sub>.

- S = Subject
- A<sup>R</sup> = Real Answer
- CS = Countersubject
- FC = Free Counterpoint
- TR = Transition
- IE = Incomplete entry
- Z = Reference to praeludium/ postludium

### 5.15 Non-*Unterweisung* Strategies in the *Ludus Tonalis*

Not every element of the *Ludus* cycle is strongly connected to the *Unterweisung*. The three most unrelated aspects include the use of polytonality, ‘consecutive fifths’ in Fugue 5, and the overall design and approach towards the tenth fugue. Polytonal references occur, in the majority of instances, in the Interludiums rather than the Fugues, as a result of the sparse textural density created by three parts in the fugues. The technique is subtly implied in Fugue 4, however, when Hindemith combines fugue subjects with different pitch centres. A further case may be argued for polytonality in the twelfth fugue, in bars 15-18, shown in example 5.46. Hindemith creates a sort of ‘bi-modal’ effect by outlining both C# major and minor simultaneously. That Hindemith emphasises the E $\flat$  by repeating the accidental in bar 15 in the bass voice proves that the effect was intended.



Example 5.46: *Ludus*, Fugue 12, bb. 15-18.

Fugue 5 has a rare occurrence of consecutive fifths in Hindemith’s two-part writing. This was forbidden in *Craft II* (1939) under rule 24.<sup>181</sup> As the *Ludus* is the pinnacle of Hindemith’s contrapuntal writing, we can therefore take this passage as evidence that he did not always apply his rules in *Craft II* dogmatically to free composition.

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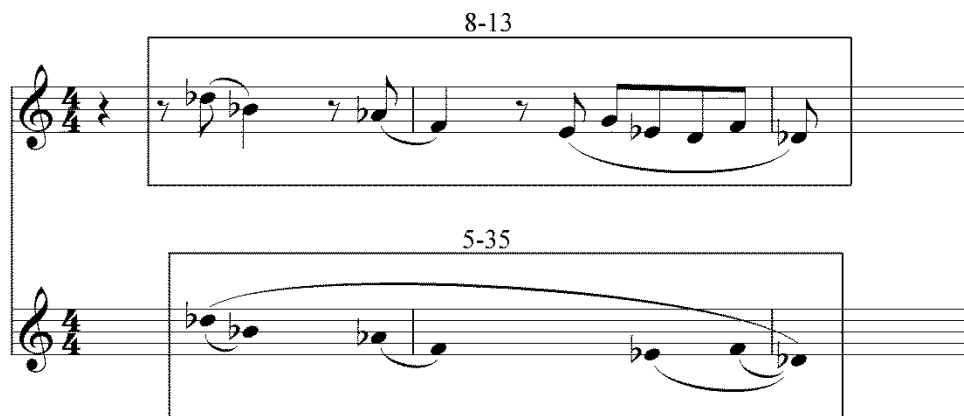
<sup>181</sup> *Craft II* (1939), pp. 26-27.



Example 5.47: *Ludus*, Fugue 5, bb. 13-14, consecutive fifths.

### 5.16 Fugue 10 in D $\flat$

The second half of Fugue 3 is a retrograde of the first. In Fugue 10, Hindemith writes the second half as an inversion of the first, with the ‘flip’ occurring at bar 18. The complete subject conforms to the irregular pc-set 8-13. It is distinguishable by the avoidance of C, and a structural use of pc-set 5-35. It is therefore a Paradigm 3 subject. While the subject centres on D $\flat$ , the opening four pitches could also imply B $\flat$  minor, making it one of the most tonal of Hindemith’s fugue subjects. This ambiguity is similar to the subject from fugue seven. Moreover, as the subject is simple compared to most other fugues in the cycle, Hindemith explores distant pitch relationships, including tritones between successive stretto entries, for the first time.



Example 5.48: *Ludus*, Fugue 10 subject analysis.

Apart from exploiting the inversional properties of 5-35, Hindemith also refers to the octatonic scale, 8-28. This scale appears much less frequently in music from this period, as it belongs much more to the pluralistic character of Hindemith early works. It is used here as

its symmetrical arrangement of tones and semitones makes it completely invertible around any axis.<sup>182</sup>

For the first time in the *Ludus* cycle, there are what appear to be recurring countersubjects. As in Fugue 3, the repeat of the first half in the second can give the implication of countersubjects. However, there is also a regular countersubject that accompanies the exposition between the answer and third subject entry. This may be observed in the following table.

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<sup>182</sup> This is discussed in Neumeyer, David, 'Counterpoint and Pitch Structure in the Early Music of Hindemith' (Yale University, PhD, 1976) p. 87.

Exposition 1				Stretto				Exposition 2			
1-2	3-4	5	6-7	8-10	11-12	12-14	15-17	18-19	20-21	22	23-24
-	<b>A<sup>R</sup></b>	TR	CS <sub>1</sub>	E	CS <sub>3</sub>	<b>S</b>	<b>S</b>	-	-	-	<b>S<sup>INV</sup></b>
<b>S</b>	CS <sub>1</sub>	TR	CS <sub>2</sub>	E	-	<b>S</b>	<b>S</b>	<b>S<sup>INV</sup></b>	CS <sub>1<sup>INV</sup></sub>	TR <sup>INV</sup>	CS <sub>2<sup>INV</sup></sub>
-	-	-	<b>S</b>	E	<b>S</b>	FC	FC	-	<b>S<sup>INV</sup></b>	TR <sup>INV</sup>	CS <sub>1<sup>INV</sup></sub>
Pitch Centre	<b>D<sub>b</sub></b>	<b>A<sub>b</sub></b>	<b>D<sub>b</sub></b>		<b>B</b>	<b>G<sup>#</sup>-D</b>	<b>D<sub>b</sub>-A<sub>b</sub></b>	<b>C<sup>#</sup></b>	<b>F<sup>#</sup></b>		<b>C<sup>#</sup></b>
Series 1 ( <b>D<sub>b</sub></b> )	<b>0</b>	<b>1</b>	<b>0</b>		<b>8</b>	<b>1-9</b>	<b>0-1</b>	<b>0</b>	<b>2</b>		<b>0</b>

		Stretto	Stretto
25-27	28-29	29-31	32-36
E <sup>INV</sup>	<b>S</b>	FC	Codetta
E <sup>INV</sup>	-	<b>S</b>	Codetta
E <sup>INV</sup>	FC	<b>S</b>	Codetta
Pitch Centre	<b>D<sup>#</sup></b>	<b>B<sup>#</sup>-F<sup>#</sup></b>	<b>C<sup>#</sup></b>
Series 1 ( <b>D<sub>b</sub></b> )	<b>7</b>	<b>t-2</b>	<b>0</b>

Table 5.4: Fugal synopsis of Hindemith's *Ludus Tonalis*, Fugue 10 in B<sub>b</sub>.

- S = Subject
- A<sup>R</sup> = Real Answer
- CS = Countersubject
- FC = Free Counterpoint
- TR = Transition
- IE = Incomplete entry

## 5.17 Hindemith's Compositional Process

The surviving *Ludus* sketchbook contains significant data on Hindemith's compositional practice, much of which may be related to the *Unterweisung*. Some fugues were written down nearly identically to their published form, whereas others underwent significant revisions.

Fugue 1 in C appears in two pages, and has some of the fewest alterations between the sketchbook and the published version. The only difference, save some re-spelt accidentals, is the bass line in bar seven. The two versions of this bar are compared in example 5.49. This presents a rare instance of the sketch containing more notes than the published edition; generally, this process occurred the other way around, with Hindemith progressing from a basic compositional skeleton to a more 'fleshed out' version. The comparison shows that Hindemith had initially planned to approach the middle C in bar seven by descent from the D $\flat$ . It is likely that he removed this because of the similar motion that it produced with the top voice. His final version approaches the C from below with a 'strong' leap of a fifth. The alteration could also have been made to avoid the tritone produced by the D-A $\flat$ , which, as the most unstable interval in Hindemith's theory, is approach too suddenly, and by a leap in the bass.

The image displays two staves of musical notation for Fugue 1, bars 4-8. The top staff is labeled 'Published Edition' and the bottom staff is labeled 'Sketchbook Draft'. Both staves show a treble and bass clef. A bracket on the right side of the staves indicates that the two versions are being compared for bars 4 through 8. The notation includes various notes, rests, and accidentals, with a specific focus on the bass line in bar 7 where the two versions differ.

Example 5.49: a comparison of Hindemith's sketches for the *Ludus*, Fugue 1, bb. 4-8.

Fugue 4 in A is the most represented in the sketchbook. It evidently gave Hindemith some problems, as it began as an entirely different piece, based on a different fugue subject. There

must have been something intrinsically wrong, therefore, with Hindemith's first fugue, which meant that it had to be jettisoned. In the unpublished work, Hindemith began with the following subject, originally in the key of E, which was then inverted to form a new fugue:



Example 5.50: Hindemith's omitted fugue in E from the *Ludus*.

We can make the following comparison between the published and unpublished fugue versions:

1. The first version had a regular countersubject
2. It existed in three parts, like the final version
3. It had the subject in inversion, like the final version
4. The subject is short, like the final version, although otherwise completely different.

One possible conclusion is that, while writing the original fugue, Hindemith arrived at a new subject, which was much better suited to the devices of inversion and stretto. This is likely given the position of the second fugue subject within the sketches, which gives the impression of the fugue emerging from an earlier compositional process. In the majority of the other sketches, Hindemith starts a new page for each new fugue. Hindemith also appears to have run out of ideas for the inversion of his first subject, and resorts to increasingly skeletal drafts towards the end of page 15 in the sketches, which come closer to resembling a chorale harmonisation rather than a fugue.

Hindemith's first fugue draft was in E. However, his overall structure for the piece consisted of two halves, the second created using an inversion of the original subject – an identical device is used in the published fugue in A. This was the only composition of length in the sketches that was not used in the final version, which shows that Hindemith's compositional technique was

confident and refined. His substantial theoretical work on the *Unterweisung* had meant that he had developed not only a consistent style, but one that did not require substantial revisions.

The revisions to Fugue 6 show, again, that Hindemith inserted quartal pitch material. The main discrepancy between the two versions found in his sketchbook is the bass line, where Hindemith chose to replace the chromatic descent in the draft with a compound melody outlining a linear pattern of 3-9 trichords. Hindemith also chose to enharmonically alter the ending from E $\flat$  major to D $\sharp$  major, perhaps to make this pattern of trichords more legible. It could not have been for any structural reasons, as the succeeding interludium begins with an E $\flat$  major chord. The sketches also show a misprint in the published version at bar 40, where the major third in the bass should be replaced by the ‘stronger’ interval of a fifth.

#### Final Version

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#### Draft

Example 5.51: comparison of bb. 45-50 of Fugue 6 in E $\flat$ , between the published version and sketchbook draft.

It is likely that Hindemith intended Fugue 8 to begin the cycle, as it was originally written in C. Unlike other examples, such as J. S. Bach’s WTC, where it is possible that the composer originally wrote a fugue in one key and then transposed it, to facilitate the composing process, Hindemith did not need to transpose from a simple to a more complex key signature. He must therefore have originally intended the fugue to be in C. It was also originally notated in compound metre, rather than 4/4 as shown in example 5.36, and with a simpler rhythm.



Example 5.52: Hindemith's original fugue subject.

'Fugue' 11, which is technically a double canon with accompaniment, began life in Hindemith's sketches as a standard fugue, the exposition for which is shown in example 5.53. It shows Hindemith working from a skeletal framework, which he would have then attempted to 'flesh out'. While the subject remained essentially the same, Hindemith seems to have been struck by the idea to turn it into a canon. This typifies his attempts to make the *Ludus*, above all else, a cerebral composition, and the fact that he also changed the time signature from 4/4 to 4/2 shows a reference to an older, *alla breve* style.

Example 5.53: *Ludus*, Fugue 11 unpublished draft.

### 5.18 Hindemith's 'Blackboard' Fugue Strategies

Hindemith was reputed to have a formidable ability to improvise compositions, particularly fugues, during class teaching. There are three extant fugue sketches, which were notated by students, from classes at Yale, Tanglewood and Buffalo, all of which date from approximately 1940.<sup>183</sup> By analysing his counterpoint and fugue subjects, it is possible to understand how Hindemith was able to perform such quick compositions: by emphasising the structural use of

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<sup>183</sup> These have been made available by the University of Yale Hindemith Collection and the University of Buffalo Library.

quartal pitch collections. This draws further connections between the *Ludus*, the *Unterweisung* style, and Hindemith's compositional processes.

The fugues from Yale and Buffalo are merely brief sketches, copied down hastily by students. However, they show Hindemith's approach to writing fugue subjects and answers. In the Buffalo fugue fragment, Hindemith's subject can be understood as a Paradigm 2 subject, comprising pc-set 9-9.

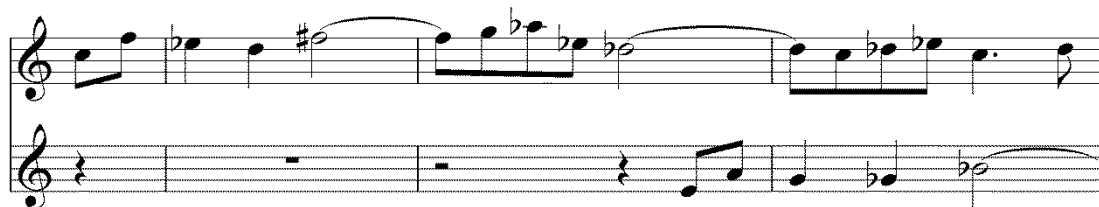


Example 5.54: Hindemith's Buffalo Fugue, written in 1940.

Hindemith's Yale fugue is of significant value, as it contains an original subject written by a student. This is followed by a correction to the fugue with the beginning of an answer (example 5.56) and then a 'better' version lasting six bars. The original subject is clearly influenced by Hindemith's style, although Hindemith's first correction changes the opening interval to a fourth rather than a fifth.<sup>184</sup> He offers two possibilities for the entrance of the answer, deciding in the end that an octave is best; although the different contours in the answer lead one to wonder whether the student copied the work down from the board correctly.



Example 5.55: original subject by a student.



Example 5.56: first correction to the subject.

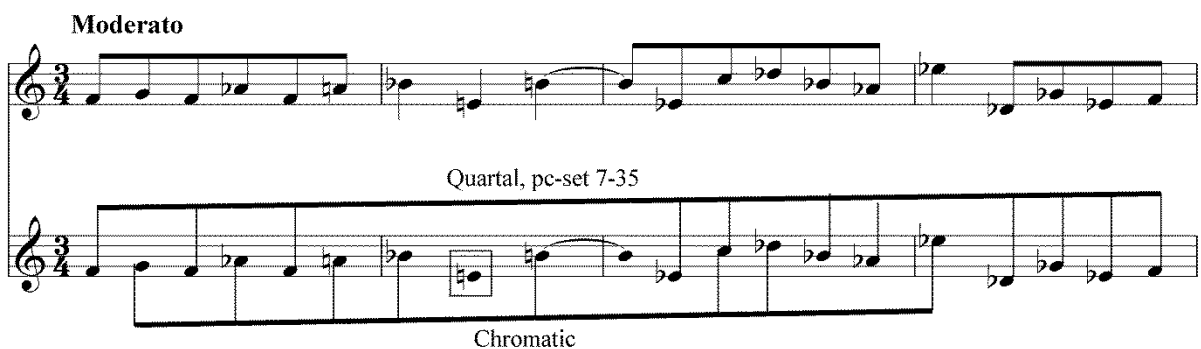
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<sup>184</sup> This adds credence to the reputation that Hindemith's strong personality and international reputation meant that all of his students inevitably wrote in a similar style.



Example 5.57: second correction to the subject.

The Tanglewood Fugue is a more substantial autograph, and includes the entire work, written in six sessions of the academy. It has much in common with Hindemith's subsequent *Ludus* fugues, particularly as it was written in three parts. It must be no coincidence that Hindemith never completed his *Unterweisung IV*, and had therefore only formulated the *Unterweisung* in up to three voices, and never wrote fugues in more than three parts. The exposition entries are I-VII-I, which is a more distant relationship than any of the *Ludus* expositions. His fugue subject is a combination of an ascending chromatic pattern within a quartal collection, and is therefore a Paradigm 3. These pitch groupings are created by the salience factors of repetition, metric position, and phrase structure.



Example 5.58: Hindemith's unpublished blackboard fugue from Tanglewood (1940/1).

The size of the quartal collection 7-35 in this example offers an alternative reading: that there is a scale substitution. In other words, while the pitch centre is F, the pitches used imply D $\flat$  Major.

This is problematised by the use of  $E\sharp$  in the subject, however, which enforces neither F nor D $\flat$  subsets.

A study of these pedagogical fugues provides a further context for Hindemith's *Ludus*. His concern with the *Unterweisung* is reflected not only by the quartal collections of the subjects, but in the very fact that he was writing so many fugues around the early 1940s. Hindemith's formulation of music theory found an ideal outlet in fugue writing, as it was capable of demonstrating all of the remarkable transformational operations available to counterpoint written with quartal pitch collection – which are shown in the chapter three to have been related to Series 1 and 2.

### 5.19 Conclusions

The *Ludus* was written between 29 August and 9 October 1942, which, given the contrapuntal complexity and length of the work, is a considerable achievement. Hindemith's awareness of the cyclic properties of Series 1 meant, however, that it is likely he had been considering a composition that explored the range of operations available to it for some time.

A divide exists between the devices that Hindemith used in these fugues. Stretto and canon may be reasonably picked up by the competent listener, whereas retrograde and inversion are much more difficult to hear. These latter examples are 'visual' devices which may be more readily observed on the page. This contrasts Hindemith's post-*Unterweisung* music with the early works, which were written more directly for the listener and performer, and contained, by contrast, far more performance directions and exaggerated expression and tempo markings. Hindemith's *Ludus* is perhaps more rewarding to the music analyst, who has the time to filter through the unparalleled riches of transformational operations to be found in the cycle, than the listener or performer. It is unreasonable to expect a modern listener to hear and appreciate these devices

without access to a score, despite Hindemith’s fearsome expectations in aural skills. It is not coincidental that many of the performances of the *Ludus* have been lecture recitals.<sup>185</sup>

The use of quartal pitch collections is especially common in twentieth-century fugue subjects, and Hindemith was not alone in recognising the large array of transformational operations that this afforded. Bartók’s *Concerto for Orchestra* (1944) contains quartal pitch collections used to construct a fugue with inversion and stretto. Example 5.59 shows the fughetta formed between two trumpets. The opening five bars of the subject comprise pc-set 4-23. The ‘answer’ in the first trumpet is an inversion of the subject, which is possible harmonically because of the quartal collection – the accompaniment to the fugue remains the same for both entries. Example 5.60 shows the stretto found in the first movement, which again is possible due to the quartal harmony implicit in the structure of the subject. The subject overlaps in the trumpets and trombones in all six parts, which is a remarkable compositional achievement enabled by quartal pitches, where any inversion or overlap creates a harmonically similar result.

Example 5.59: Bartók, *Concerto for Orchestra*, fifth movement, bb. 201-221.

<sup>185</sup> Neumeyer gave a lecture recital on 24 October, 1977, for example, entitled ‘Process and Product: The Genesis and Structure of Hindemith’s “Ludus Tonalis”’ at the University of Kansas School for Fine Arts.

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The image shows a musical score for six brass instruments: three Trumpets in C (I, II, III) and three Trombones in C (I, II, III). The score is for measures 363-371 of the first movement of Bartók's Concerto for Orchestra. The music is marked 'f marc.' (f marcato). The notation includes various rhythmic values and intervals, with some notes marked with a '7' indicating a specific interval or rhythm. The score is written in a minor key, as indicated by the key signature (one flat).

Example 5.60: Bartók, *Concerto for Orchestra*, first movement, bb. 363-371.

The relationship between Hindemith's *Unterweisung*-music theory and the *Ludus* is very strong, as demonstrated by a survey of the background and foreground of the composition. Series 1 states that the intervals of a fourth and fifth are of the closest structural affinity to a fundamental pitch. This may be found throughout the *Ludus*, in three primary ways: by regular use of quartal chords (3-9, 4-23, 5-53 and 6-32), by basing contrapuntal lines over a background skeleton which emphasises quartal regions by salient factors, and by planning the fugue subject entries, and their corresponding answers, on their distance from a fundamental. The starting pitches of each fugue corresponding to Series 1 are an even deeper background level reference to the *Unterweisung*.

The Series 2 relationship is harder to quantify. It includes the doubling of root pitches at structural points, 'strong' intervals immediately following 'weak' ones, and sensitivity to harmonic fluctuation. These areas help to offer a coherent compositional technique that is not tonal or freely chromatic. However, it is much harder to pinpoint exactly how Hindemith put this into practice; indeed, he even broke some of his own rules, such as consecutive fifths in fugue five.

Hindemith's sketchbook and blackboard fugues provide valuable insights into his compositional process. The blackboard fugues show the speed with which he could write music in a class situation, and that these were written in a similar style to those in the *Ludus*. The sketchbook shows that Hindemith made the *Ludus* even more cerebral than his original inclinations, such as the eleventh fugue which started life as a conventional fugue structure before being changed into a canon with accompaniment. The sketches show that, in many cases where Hindemith altered his drafts, he did so to conform to compositional devices legitimised by the *Unterweisung* – the most prominent being the use of quartal pitch collections. He often worked from a skeletal structure resembling a choral, which was elaborated upon with greater rhythmic and harmonic interest.

The Praeludium/ Postludium pair is one of the most remarkable structural relationships ever written, and is one of the main reasons for the considerable success and renown of the work. However, that a retrograde inversion of a complete movement was possible may say more about the nature of Hindemith's compositional language – particularly concerning quartal collections – than his prodigious technique.

## Chapter 6: The Revised Music:

### ***Das Marienleben and Lieder nach alten Texten***

Hindemith revised and reworked many of his compositions. This chapter analyses two notable examples, *Das Marienleben* for soprano and piano (1923 & 1948) and *Lieder nach alten Texten* for SSATB choir (1923 & 1937-8), because each work was composed before, and then revised after, the *Unterweisung*. They therefore provide a unique opportunity to analyse the relationship of Hindemith's music theory to his compositional practice, not just as a prescriptive device, but as a corrective tool. This sets them apart from a composition such as the *Ludus Tonalis*, which was written with fresh, theoretical ideas in mind. It may be understood as a comparison of instinctive and systematic composition.

Similar to the *Ludus Tonalis*, the *Marienleben* cycle is a composition of noteworthy length and scope. That all of the songs in the cycle, which lasts approximately 60 minutes in performance, underwent revision offers an enormous array of musical data that can be analysed to further understand the relationship of Hindemith's music theory to his own compositional practice. A comparison of these works also helps to quantify the stylistic difference between Hindemith's early and later styles. *Lieder nach alten Texten*, of smaller design, is insightful as an unaccompanied choral work, which affords an opportunity to engage with the revisions to Hindemith's counterpoint, in a way not found in a composition for soprano and piano. This particularly concerns Hindemith's treatment of cadences.

These works were selected from the following list of Hindemith's compositions, which were written before the *Unterweisung* and subsequently revised:

- *Das Marienleben* (first version 1923, second version 1948)
- *Frau Musica* (first version 1928-9, second version 1943)
- *Lieder nach alten Texten* op. 33  
(first version 1923, second version 1937-8, entitled *5 Songs on Old Texts*)
- *Cardillac* (first version 1925-6, second version 1952)
- *Neues vom Tage* (first version 1928-9, second version 1953-4)<sup>186</sup>

Hindemith's revisions to *Neues vom Tage* (1953-4), while occurring well after the *Unterweisung* in 1953, are primarily related to the stage drama and are therefore not theory driven.<sup>187</sup> *Frau Musica* belongs to his op. 45 collection *Sing- und Spielmusik für Liebhaber und Musikfreunde*, which was written with the needs of amateurs in mind and therefore does not reflect on the complex theoretical issues found in the other revised works.

The revised edition of *Marienleben* is preceded by a substantial foreword of eight pages in length, in which Hindemith summarises his revisions and motivations. It is rare for composers to document the revision process in this detailed manner, which is made even more significant given the connection between *Marienleben II* and Hindemith's music theory. This chapter therefore explores the atypical relationship between theory and practice, as a consequence of the unique circumstances of the *Marienleben* cycle.

In the following analysis of Hindemith's revised music, the following areas receive priority:

1. Rhythm and Metre
2. Tessitura
3. Voice Leading and Melodic Shape
4. Dynamics
5. Character
6. Large Scale Structural Planning
7. Harmonic Practice:
  - a. works that retain the background skeleton
  - b. works that alter the background
  - c. harmonic density/ rhythm

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<sup>186</sup> All dates are taken from Schubert, Giselher, 'Paul Hindemith' *New Grove Online*, accessed 5 April 2013.

<sup>187</sup> See Skelton, Geoffrey, *Paul Hindemith: the Man behind the Music* (London: Gollancz, 1975) p. 266: Hindemith's 'alterations to *Neues vom Tage* were simply efforts to improve the stage-worthiness of a work which he once described to Cox as "a harmless and funny comedy".'

Of these categories, we may relate five areas to Hindemith's music theory. The first concerns his use of Series 1. Similar to the *Ludus*, Hindemith uses Series 1 on both foreground and background levels. However, perhaps for the only time in Hindemith's music, this order of pitches is also used to carry extra-musical symbolism, similar to a leitmotif, relating to the dramaturgy of the *Marienleben* cycle. The second area is Series 2, which impacts upon the harmonic practice, such as chord type and chord fluctuation. While Hindemith provides a detailed taxonomy for chord values and fluctuation, the application of Series 2 to free composition is one of the least explicit components of the *Unterweisung*, as also found in the *Ludus* analysis. The third area relates to voice leading within a two-voice framework, generally found by isolating the two outer parts. This is also relevant for the fourth area, which concerns changes to the soprano part. These changes are made primarily to form a more idiomatic soprano part, but will also have been influenced by the agenda of two-voice framework. Finally, the fifth area that relates to the *Unterweisung* is the notable change in character and expression markings. These become more explicit and conservative in Hindemith's post-*Unterweisung* style.

This chapter provides general examples of Hindemith's revisions, before three more detailed case studies which examine (1) a song with regular, yet minor revisions, (2) a song with significant background revisions, and (3) a new song, that bares no similarities to the original. It then analyses four songs from *Lieder nach alten Texten/ Five Songs on Old Texts* to provide a more focused examination of the contrapuntal revisions afforded by the *Unterweisung*.

## 6.1 *Das Marienleben*

Das Marienleben contains in microcosm the essence of Hindemith.<sup>188</sup>

The original *Marienleben* cycle was composed during a year of prodigious creativity that also gave birth to a song cycle, *Die junge Magd, Suite 1922, Kammermusik Nr 1* for small orchestra, a ballet, *Der Dämon*, a stage work for children, *Tuttifantchen, Sonata for Solo Viola op. 25/1, Sonata for Solo Cello op. 25/3* and *Sonata for Viola d'amore and Piano op. 25/2*.<sup>189</sup> Similar to many of these works, Hindemith demonstrates stylistic pluralism between songs of the *Marienleben* cycle. It consists of fifteen songs, which set the poems of Rainer Maria Rilke (1875-1926), which depict the life of the Virgin Mary. The cycle is divided into four parts: Mary's life before Jesus, the birth of Christ and the journey to Egypt, the death of Christ, and finally the death of Mary herself.<sup>190</sup> Skelton (1975) notes that Hindemith likely chose the text for its rich subject matter, rather than out of religious sympathy.<sup>191</sup>

The first version lasts a little over sixty minutes in performance.<sup>192</sup> The premiere was performed by soprano Beatrice Lauer-Kottlar and pianist Emma Lübbecke-Job, who also gave the premieres of many other piano works by Hindemith. Skelton (1975) documents correspondence from Hindemith to his publishers, which states, 'I definitely think they [the *Marienleben* songs] are the best things I have yet written'.<sup>193</sup> This is quite an admission, given that previous works included *Sancta Susanna* and *Kammermusik Nr 1*. It is all the more surprising, given that soon after

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<sup>188</sup> Copland, Aaron, *Aaron Copland: a reader: selected writings 1923-1972* (New York: Routledge, 2003) p. 215.

<sup>189</sup> Skelton, Geoffrey, *Paul Hindemith: the Man behind the Music* (London: Gollancz, 1975) pp. 66-67.

<sup>190</sup> Hindemith, Paul, *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948) p. 5.

<sup>191</sup> *Ibid.*, p. 76. However, Hindemith did appear to become more spiritual towards the end of his life, particularly given his Mass of 1963, which was part of an unfinished cycle of mass settings, and as a result of his marriage to Gertrud, a practising Roman Catholic.

<sup>192</sup> Given the length of the cycle, performance timings vary. The timing is based on Lenz-Kuhn & Kaiser (Thorofon) of 61'06.

<sup>193</sup> Skelton, Geoffrey, *Paul Hindemith: the Man behind the Music* (London: Gollancz, 1975) p. 77.

the first performance of *Marienleben* in 1923, Hindemith considered revising it.<sup>194</sup> The work was written at a slower pace than other works from this period, in the eight months of June, July, November and December 1922, and April to July 1923. Neumeyer also notes that the sketchbooks contained little rejected or reworked material, which parallels much of Hindemith's work in the 1920s.<sup>195</sup>

By contrast, there are many jettisoned revisions, cited by Hindemith in his foreword to *Marienleben*.<sup>196</sup> These include songs with up to five completely different versions, and songs with up to twenty reworked passages. Noss (1987) states that Hindemith 'had begun the revisions in 1936, intending to have it published along with his *Unterweisung im Tonsatz* as a demonstration of how the theoretical principles outlined in the book might be applied.'<sup>197</sup> The majority of Hindemith's revisions took place from 1936-7, 1941-2 and finally from 1945-8.<sup>198</sup> This shows that Hindemith, while he started out with the intention of including the revisions as a further example of his *Unterweisung* in practice, found it too great a challenge. That it occupied him for a further decade must have meant that the revision process presented further theoretical and musical issues that needed to be addressed. This could further be related to Hindemith's refusal to publish his contrapuntal theory in more than two parts; he perhaps realised that the *Unterweisung* was not proving to be as universal as he had claimed.

Hindemith orchestrated six of the *Marienleben* songs. Numbers 1, 5, 7 and 8 were published in 1939, and numbers 10 and 15 were published in 1959. They are now published together in the

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<sup>194</sup> Holl, Karl, 'Musikleben: Frankfurt a. M.' *Die Musik* Vol. 16 (1924) p. 297, writes that 'Hindemith will shortly undertake a review of the entire cycle'. This is cited in Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) p. 137.

<sup>195</sup> Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) p. 143.

<sup>196</sup> Hindemith, Paul, *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948) p. 3; Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) p. 137.

<sup>197</sup> Noss, Luther, *Paul Hindemith in the United States* (Urbana: University of Illinois Press, 1989) p. 128. This is also confirmed by Skelton (1975) p. 134. Were these sketches to surface, they would offer further insights into the temporal relationship between Hindemith's revisions and the *Unterweisung*.

<sup>198</sup> Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) p. 145.

collected edition as *Sechs Lieder aus 'Das Marienleben'*. It is unclear whether Hindemith intended to orchestrate the complete cycle, although the orchestrations began during his theoretically driven revision of the piano version.<sup>199</sup> The collection of six orchestrated songs also forms a musical and dramatic summary of the longer cycle with piano. 'Geburt Mariä' and 'Vor der Passion' are literal orchestrations of the revised versions that were to appear in *Marienleben II* in 1948, with only very small discrepancies. It is revealing that the opening bass motif from 'Vor der Passion' is given to the 'cello, which furthers the affinities between the expressionistic pitch collections of this song and the character of the *Sonata for Solo 'Cello* op. 25/3. The orchestration of the remaining four songs, while based on the 1948 cycle, contains more substantial elaboration. The alterations fall into two categories: those that thicken the texture, using rapid scale passages, such as 'Argwohn Joseph', bar 27; and those that add a countermelody, such as the added first violin obbligato in 'Vor dem Tode Mariä III', bars 80-83 and 'Rast auf der Flucht in Ägypten' bars 72-77 and 82-90. In addition to a thickening of the texture, the additional pitches clarify the harmonic structure.

The second cycle lasts longer than the first in performance, at over seventy minutes.<sup>200</sup> This results from the rewriting of several songs and changes to tempo markings. Hindemith's revision process is primarily theory driven, which Taruskin (2005) summarises as follows: 'the cycle's key sequence was reordered in conformity with Series 1, its harmonies were clarified in conformity with Series 2, and its melodic writing was tamed to make it more practical for the singer.'<sup>201</sup> This misses, however, the important foreground and background voice leading relationships within each song, which are aligned to follow Series 1 hierarchies more closely. In greater detail, the revisions made to *Marienleben* may be summarised in six areas:

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<sup>199</sup> Kaufmann, Henry W., *Paul Hindemith: Sämtliche Werke* (Mainz: Schott & Co., 1982) p. XI.

<sup>200</sup> Recordings of *Marienleben II* include Kupper & Seemann (Christophorus, B002B3CH6O, 1990): 75'41, Meyer-Topsoe & Salo (Danacord Records, B001QWFVGY, 2009): 70'58 and Isokoski & Viitasalo (Ondine, B002JP9I5M, 2009): 71'42.

<sup>201</sup> Taruskin, Richard, *Music in the Early Twentieth Century* (New York: Oxford University Press, 2005) p. 769.

1. An increased preference for quartal harmony
2. In general, fewer, and more direct, performance directions and expression markings
3. Cerebral proportional designs
4. A conventional approach to voice leading and counterpoint
5. Clearer, more tonal harmonic progressions
6. Greater sensitivity to harmonic tension, and the way that this is structured throughout a composition

These may also be related to Hindemith's analytical approach, which is illustrated in the seven graphic analyses and commentaries at the end of the *Unterweisung*. His analysis of his own *Mathis der Maler Symphony*, the final analysis of the book, contains six analytical levels: melodic degree-progression, step-progression, two-voice framework, fluctuation, harmonic degree-progression and tonality. The melodic degree-progression and step progression are governed by Series 1, and the two-voice framework by a combination of Series 1 and 2. Throughout Hindemith's *Introductory Remarks*, he describes the 'tonality' of each song, to precipitate his description of Series 1 and harmonic fluctuation relationships. This may also be found in the lowest stave of the Hindemith's music analyses. The term 'tonality', however, is potentially misleading. As discussed in chapters two and three, Hindemith's music theory is not one of diatonic tonality, but of pitch relationships within a framework that has been constructed, and legitimised, in acoustics. A system constructed with the use of overtones has inherent tonal characteristics, as has been recorded since Pythagoras. And yet his manipulation of these relationships is not a diatonic tonality as, for example, music of the Classical Style. The pitch or group of pitches that Hindemith defines as 'tonality' in his *Unterweisung* analyses are intended to be understood in terms of Series 1 and 2 distances, as distinct from the tonic-dominant polarity inherent within a Schenker reduction, for example.

There are subtle, yet frequent changes of character between the two versions. The expression and dynamic markings are considerably fewer in *Marienleben II*, and in general, the counterpoint is simplified to make it more concise, direct and technically sound – by the standards set in the

*Unterweisung*. The revisions, based on music theory, therefore brought about a change in character, as well as technique. This introduces the possibility that any systematic application of Hindemith's theoretical principles would bring about aesthetic conservatism, whether intentional or otherwise. The change in style that coincided with the *Unterweisung* is also paralleled by Hindemith's attitude towards performance. Danuser (1988) notes from the recordings of Hindemith's performances that he began with a direct, non-expressive style towards his own works in the 1920s, before reverting to a more expressive style from the 1930s.<sup>202</sup> This development parallels the growing conservatism in his compositional style.

Hindemith's revisions have invited (often heated) critical comparison. Many authors have concluded that the originals were far better: Rudolf Stephan (1954) wrote that 'in place of spontaneity one is now faced with the concoctions of an unstable theory and with a handful of practical formulae which are used by Hindemith and his imitators within the confines of respectable academicism' about *Marienleben*.<sup>203</sup> Hans Werner Henze (1949), too, preferred the first version, as did Glenn Gould (1978) in his essay 'A Tale of Two *Marienlebens*'.<sup>204</sup> Robin Holloway (2010) goes as far as to describe *Marienleben II* as 'the most extreme instance of self-correction in all music', before condemning the revisions as 'a tale of genius defeated by pedantry'.<sup>205</sup> And Skelton (1975) wrote of the revisions to *Cardillac* that 'if *Cardillac* is proving more resilient, it is the original version with the text of Ferdinand Lion which shows signs of surviving rather than the radically reshaped second'.<sup>206</sup> Neumeyer, on the other hand, disagrees with Stephan for his own musical reasons; this is perhaps not surprising given the former's

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<sup>202</sup> Danuser, Hermann, 'Abscheid vom Espressivo? Zu Paul Hindemiths Vortragsstil in den zwanziger Jahren' *HJb* Vol. 17 (Mainz: Schott & Co., 1988) pp. 26-40.

<sup>203</sup> Stephan, Rudolph, 'Hindemith's *Marienleben* (1922-1948): an assessment of its two versions' *The Music Review* Vol. 15 (1954) p. 287.

<sup>204</sup> Henze, Hans Werner, 'Das neue *Marienleben*' *Melos* Vol. 16, No. 3 (March, 1949) pp. 75-76 and Gould, Glenn, 'A Tale of Two *Marienlebens*', *Das Marienleben* [CD Liner Notes] (Sony BMG, B001UC189E, 1978, 1995).

<sup>205</sup> Holloway, Robin, 'Corrective to a Fault' *The Spectator* (27 March 2010).

<sup>206</sup> Skelton, Geoffrey, *Paul Hindemith: the Man behind the Music* (London: Gollancz, 1975) p. 236.

penchant for music theorising.<sup>207</sup> Composer and pianist Franz Reizenstein also defends the second version:

It is fascinating to read in his preface to the revised version of *Marienleben* (1948) how he [Hindemith] takes the young Hindemith to task for unvocal writing, lack of harmonic clarity and other faults. Early last year the BBC broadcast the 1924 version without giving listeners any subsequent opportunity of hearing the revised version, thus ignoring the composer's wishes. I would advocate that first versions of revised works should only be given in programmes specially devised for musicologists and students who are interested in the changes the composer made.<sup>208</sup>

Hindemith's technical clarification of harmony, melody and rhythm may be understood as an attempt to elevate the status of his art. But for those listeners who prefer Hindemith as the unpredictable and provocative *Enfant Terrible*, this reduces their enjoyment of the cycle. However, Hindemith argues in *Introductory Remarks*: 'a theory that cannot replace unnecessary and disproportionate difficulties with something easier is worthless'.<sup>209</sup> Whichever opinion one takes regarding these revisions, the debate can never be elevated beyond the status of subjectivity. Unfortunately, as Skelton regretfully concludes, 'only too often in such cases the public, uncertain which of the two versions to accept as authentic, tends to ignore both.'<sup>210</sup> As will also become apparent in this survey and analysis, many of the revisions are not as significant one might expect from the substantial secondary literature. It is the *principle* of revision that has provoked debate.

## 6.2 The 1948 Introductory Remarks

Hindemith included an eight-page foreword to *Marienleben II*.<sup>211</sup> This document summarised the changes between the two versions, and Hindemith's motivations for undertaking them. It is divided into seven sections, which may be summarised as: (1) general intentions (2) weaknesses of the first version (3) revised structural plan (4) overview of the revisions in each song (5)

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<sup>207</sup> Neumeier, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) p. 163. A large part of his monograph is dedicated to a new theoretical understanding of Hindemith's music, particularly in accordance with *Unterweisung III*.

<sup>208</sup> Reizenstein, Franz, 'Paul Hindemith' *Essays on Music: an Anthology from The Listener* (London: Cassell, 1967) p. 134.

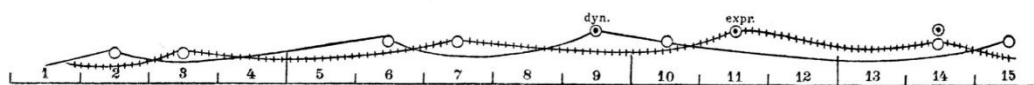
<sup>209</sup> *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948) p. 4.

<sup>210</sup> Skelton, Geoffrey, *Paul Hindemith: the Man behind the Music* (London: Gollancz, 1975) p. 236.

<sup>211</sup> There is a high word count for these eight pages, as the text is small and tightly spaced.

motivic and thematic relationships (6) revised tonal structure and (7) concluding remarks. It can be read in several ways: as a simple map to Hindemith's revision process, as an artistic confession, or as a defensive document that attempted to legitimise his alterations against potential critics. Hindemith provides his own explanation as: 'what I have set down is intended to give the reader subject matter for reflection rather than an exhaustive analysis.'<sup>212</sup> This could not form a greater contrast with his youthful statement from 1922, quoted in chapter four, 'I cannot give analyses of my new works because I don't know how to explain a piece of music in a few words (I would rather write a new one in the time).'<sup>213</sup>

Hindemith highlights the main problems in the first cycle as poor soprano writing and the lack of a structural plan. This includes both dynamic and expressive designs, which he traces in the following chart:



Example 6.1: Hindemith's revised climax diagram from *Introductory Remarks* (1948) p. 6.

The dynamic climax (song 9), has the loudest dynamic markings (fff) maintained for the longest time. The expressive climax (song 11) meditates on the 'Pietà', and contains atmospheric writing: repetition, understated dynamic range, avoidance of resolution and sparse textures. Hindemith's chart is therefore explicitly related to the revised score. However, without a precise y axis, the reader is not offered the further information necessary to quantify the tripartite relationship between the songs, tonal symbolism and Series 1. This is implied throughout the introductory text, however, where Hindemith defines each tonal symbolism, and where it appears within the music.

<sup>212</sup> Hindemith, Paul, *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948) p. 6.

<sup>213</sup> Kemp, Ian, *Hindemith* (London: Oxford University Press, 1970) p. 1, also cited in chapter four.

	Song	Tonality	Subtonalities
	Complete Cycle	E	
1	Geburt Mariä	B	G#, A
2	Die Darstellund Mariä im Tempel	C	
3	Mariä Verkündigung	A	C#, Eb, G#
4	Mariä Heimsuchung	B	Eb
5	Argwohn Josephs	F	C#, A
6	Verkündigung über den Hirten	A	D, G#, Bb, B
7	Geburt Christi	E	C, C#, Eb, G
8	Rast auf der Flucht in Ägypten	D	F#, G#, A
9	Von der Hochzeit zu Kana	E	Eb, F, F#, G#, A
10	Vor der Passion	F#	Eb, E, G#
11	Pietà	Bb	Eb
12	Stillung Mariä mit dem Auferstandenen	E	
13	Vom Tode Mariä I	Eb	G, A, Bb
14	Vom Tode Mariä II (Thema mit Variationen)	D	C#, Eb, A
15	Vom Tode Mariä III	A	C#, Eb, F#, B

Table 6.1: tonal symbolism in *Marienleben II*.

A simple distribution analysis of pitch centres for the revised cycle may be constructed as follows. The only pitches to be repeated are E (three times), B (twice) A (three times) and D (twice). Together they form the quartal set 4-23.



Example 6.2: *Marienleben II* pitch centres.

These key relationships were formed out of a desire to use keys to relate not only to specific moods, but to topics. This provides a further compositional possibility inherent within Hindemith's system of pitch hierarchy: that, not only can they relate to melodic distance, but to extra-musical meaning.

One of the most important subjects within Hindemith's *Introductory Remarks* is his reference to key symbolism. In *Marienleben II*, Hindemith ascribes specific pitch centres to recurring themes in the text. Given this key symbolism, Hindemith's foreword is an essential guide. Hindemith's

symbolisms for each pitch centre are as follows, in order of decreasing distance from the fundamental pitch for the cycle, E:

Tonality	Series 1	Hindemith's Description
E	0	'that for which gives [Mary] her existence its meaning, and without which we should not be able to understand and revere the life of Mary: the nature of her son.'
B	1	'Mary herself is represented by the tonality of B, which as the dominant is dependant on E, and yet is indispensable to the interpretation and determination of the latter – just as the earthly existence of Christ is made possible through His mother.'
A	2	'Complementary to the dependence of B as the dominant of E is the subdominant relation of A. If the B represented the earthly origin of Jesus, A reminds us of the other side of His being: the celestial, the divine.'
C#	3	'the inevitable, the fixed, the unalterable'
G#	4	'our inability to grasp things that lie outside our power of conception'
G	5	'the tonality of the idyllic'
C	6	'appears whenever the idea of infinity and the eternal is to enter our imagination'
F#	7	'The acknowledgement of the smallness that one feels in the face of the exalted and the incomprehensible.'
D	8	'Trust and confidence'
F	9	A tritone from B (Mary), F 'is connected with everything that moves us by its mistakenness or short-sightedness to regret and pity'.
E <sub>b</sub>	T	'the greatest purity, the purity that is sublimated into lifelessness and in the end becomes identical with death.'
B <sub>b</sub>	E	'everything in the domain of human feelings that at first opposes itself to the believing acceptance of all the wondrous happenings'

Table 6.2: tonal symbolism in *Marienleben II*.

To highlight the depth of key symbolisms in the revised cycle, Hindemith provides the following commentary of song 14:

(‘Death of Mary’, II) The tonal contemplation of the death of Mary there set down would lead us to approximately the following series of thoughts and feelings: we are made aware of the entrance into infinity (C, measure 1), which, with its utter inexorability (C#, measures 2-3) but yet with its infinite gentleness (diffuse G, measure 4) fills us with a feeling of our own minuteness (F#, measures 5-6). Although we trust fate (D, measure 7) we are nonetheless troubled by a slight feeling of lack of understanding (B<sub>b</sub>, 8). The believer will recognize in the Redeemer (E, 9-10) and in His once earthly mother (B, 11) his guides towards the final purity of death (E<sub>b</sub>, 11-12).<sup>214</sup>

It is implied from his foreword that Hindemith hoped these key symbolisms would have an aural effect upon the listener. This is one of the main factors in the *Marienleben* revisions to have provoked critical reaction. However, it is not his only objective. He parallels his intellectualised

<sup>214</sup> Hindemith, Paul, *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948) pp. 12-13.

method of musical construction with the fourteenth-century isorhythmic motet.<sup>215</sup> As Hindemith's fascination with music of the fourteenth century – and early music more broadly – gathered momentum only following his emigration to the USA, this shows that Hindemith's revisions to *Marienleben* were based not only upon the technical concerns of the *Unterweisung*, but upon musical fascinations that evolved independently of his music theory. It is further plausible that Hindemith hoped his intellectualised approach to composition and revision would facilitate a more lasting engagement with his music, making it not only satisfying to listen to, but to study.

In addition to Hindemith's 'divine symbolism' reworking, he uses a form of leitmotif. The most notable example is the opening six bars in the piano part from the first song, which Neumeyer has found to resemble a Mariensonate by the baroque composer, Heinrich Biber (1644-1704).<sup>216</sup> This appears throughout the cycle, in a number of different characters. This leitmotif treatment was a completely new addition to *Marienleben II*; it did not occur at all in the first version. After the first song, it appears in number six, bar 203, and throughout number seven. Each occurrence coincides with the theme of Mary in the text.

Hindemith was evidently pleased with the opening motif to the *Marienleben* cycle, as he chose not to alter it in any way.<sup>217</sup> It comprises the incomplete quartal collection 4-26: in the opening bar, an E is required to 'complete' pc-set 5-35. Both the vertical alignment of the first chord, and the subsequent voice leading in the right hand, suggest quartal pitch collections.

The only point where a single chord comprises a complete quartal collection is the final beat of bar two, pc-set 3-9. That this occurs on a weak beat is surprising, as Hindemith generally uses

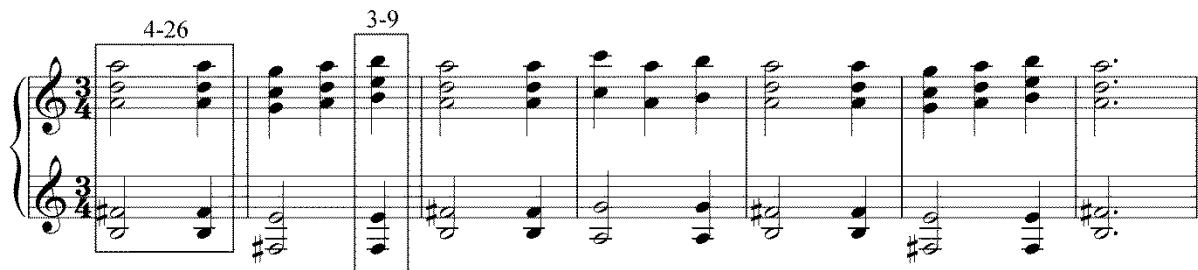
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<sup>215</sup> Ibid., p. 13.

<sup>216</sup> Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) pp. 146-149.

<sup>217</sup> His metronome marking, while remaining the same between both versions, is notated differently. In the 1923 version Hindemith writes crotchet = 120, whereas in the 1948 version he writes dotted minim = 40-42. This shows that Hindemith wanted the bar, rather than the crotchet beat, to be emphasised.

quartal collections at structural strong points. However, this lends the motif its character: one of unresolved harmonic stasis.



Example 6.3: The opening to *Marienleben* (both versions).

### 6.3 A Critical Comparison of *Marienleben* 1923 and 1948

In Hindemith's two published versions, his titles and order of movements remains unchanged, as does the text. The following table summarises the main differences between each version.

	<b>Song</b>	<b>Revision Comments</b>
1	Geburt Mariä	Small differences, apart from two rewritten passages
2	Die Darstellund Mariä im Tempel	Entirely rewritten. Some general dynamic similarities. Some small similarities between the backgrounds of the bass line. Basic rhythmic similarities in the soprano part.
3	Mariä Verkündigung	Entirely rewritten.
4	Mariä Heimsuchung	Small revisions.
5	Argwohn Josephs	Small changes to voice leading.
6	Verkündigung über den Hirten	Similar in character, but with regular significant structural revisions.
7	Geburt Christi	Song replaced entirely with a new version.
8	Rast auf der Flucht in Ägypten	Basic alterations to chord fluctuation and voice leading. Piano accompaniment is simplified.
9	Von der Hochzeit zu Kana	Major revisions to accommodate a more effective dynamic plan. This includes replacing the opening fugato section. The new composition has also more than doubled, from 82 to 166 bars.
10	Vor der Passion	Small melodic alterations, with an extended piano postlude.
11	Pietà	Almost identical, with additional pitches in the piano to support the vocal part. The dynamics have been altered to conform with the overall dynamic plan for the cycle.
12	Stillung Mariä mit dem Auferstandenen	The only unchanged song.
13	Vom Tode Mariä I	Harmonically and melodically 'cleaned up': regular changes to the voice leading of the soprano part. Piano accompaniment unchanged in character, with only minor adjustments of voice leading. Some piano textures in the latter half of the song are reduced from four to three parts.
14	Vom Tode Mariä II (Thema mit	Revisions treated in the same manner as song 13.

	Variationen)	
15	Vom Tode Mariä III	Revisions treated in the same manner as song 13.

Table 6.3: The bar numbers quote in this table refer to the first edition unless otherwise specified.

Not all of the changes are acknowledged by Hindemith in his comments. However, he often gives a precise justification for his revisions. Furthermore, not all of his changes were directly motivated by theoretical concerns. Some of the changes are explicitly related, others are not. It is not necessary to cover all of the revisions here, which are not directly related to the *Unterweisung*.

These differences may then be further categorised in to the following areas:

1. Songs that were completely unchanged
2. Songs that were retained in every sense, with the exception of very small details
3. Songs where significant voice leading changes are made, but with similar character and background structures to the original
4. Songs that were entirely rewritten

These four differences form the basis of my case studies of the *Marienleben* revisions.

## 6.4 General material that was not revised

Only the eleventh and twelve songs, *Pietà* and *Stille Mariä mit dem Auferstandenen*, remained untouched, save some very small exceptions, by Hindemith's revisions. They occur at the emotional climax of the cycle: one explanation for the lack of revisions may therefore be that Hindemith had infused the songs with so much musical energy in the first version that he was reticent about changing them. They are also some of the most motivically concise works in the cycle. The *Pietà* chord also appears at the end of song number nine, in bar 139, as a prelude of number eleven: in this way, it almost resembles the use of leitmotif that Hindemith was to introduce in his revisions.

*Pietà* is largely unchanged between the two versions, with the exception of some supporting piano material. This begs the question: what was theoretically correct in the first version? The opening bar features as a recurring motif throughout the song, implying a monothematic

approach, which is responsible for the strong atmosphere of the song. The opening chord is neither octatonic, nor based on quartal harmony. It contains two tritones, and falls within Hindemith's less stable group B chords. The fifth interval on the fourth beat of the bar may be understood as a resolution to this chord, although because of the omission of four of the parts this is incomplete. Furthermore, this resolution offers a bitonal effect, as it implies a combination of F major and B $\flat$  major triads.

The opening soprano phrase gives the strongest indication as to why much of the song was not revised. Each set of three notes comprises pc-set 3-9. Furthermore, the voice leading emphasises descending fourths and ascending fifths. When this part does not feature, the two-voice framework strongly emphasises the perfect fifth interval, B $\flat$ -F.

The image shows a musical score for 'Pietà' from *Marienleben* (1923), no. 11. It consists of a vocal line and a piano accompaniment. The vocal line has two phrases of three notes each, both labeled as pc-set 3-9. The piano accompaniment features a two-voice framework with a perfect fifth interval (B $\flat$ -F) in the bass line.

Example 6.4: *Marienleben* (1923), no. 11, 'Pietà', bb. 1-5.

The style of *Pietà I* is strongly characteristic of Hindemith's early, expressionistic style. That it remained almost unchanged in *Marienleben II* is therefore surprising, as Hindemith did not write in this style again until the end of his life, in works that include the *Tuba Sonata* (1955) and *Messe* (1963). In *Introductory Remarks*, Hindemith writes of *Pietà* that it 'has not been changed, except for a few tones added to support the voice.'<sup>218</sup> This is not an accurate summary. The opening five bars consist of two 3-9 trichord, symmetrical around an E/F axis, shown in example 6.4.

<sup>218</sup> Hindemith, Paul, *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948) p. 8.

According to Hindemith's summary, the additional counterpoint in the right hand of the piano from bars three to four was included to support the vocal part. However, it has another function, which Hindemith does not mention. It introduces a new pitch on the final quaver beat of bar four – a G – which completes a new quartal tetrachord, 4-23, using the remaining pitches in the phrase. The opening five bars become entirely quartal with the addition of this pitch, whereas in *Pietà I*, they were not.

The image shows a musical score for 'Pietà' from Hindemith's *Marienleben*. It consists of two staves: a vocal line and a piano accompaniment. The tempo is marked 'Sehr langsam (♩ etwa 38)'. The vocal line begins with the lyrics 'Jetzt wird mein E - lend voll,'. The piano part features a melodic line in the right hand and a bass line in the left hand. Dynamics include *mf* (mezzo-forte) and *p* (piano). There are annotations for phrasing, including a slur over the vocal line and a slur over the piano's right hand. Above the piano's right hand, there are markings '3' and '4' indicating a triplet and a quartal tetrachord respectively.

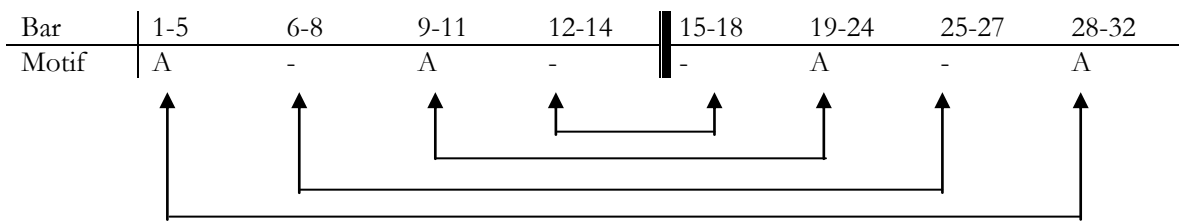
Example 6.5: *Marienleben* (1948), no. 11, 'Pietà', bb. 1-5.

The image is a pitch analysis diagram for the first five bars of 'Pietà'. It shows a single melodic line on a staff. A central note is labeled 'point of symmetry'. To the left of this point, there is a box labeled '3-9' indicating an interval. To the right, there is a box labeled '4-23' indicating another interval. The diagram illustrates the symmetrical arrangement of pitches around the central point.

Example 6.6: *Marienleben* (1948), no. 11, 'Pietà', bb. 1-5 pitch analysis.

Neumeyer (1976) describes the symmetrical arrangement of 'Pietà'.<sup>219</sup> This is paraphrased in example 6.7, with a central point occurring between bars 14 and 15. Hindemith's penchant for mirror devices is nowhere more apparent than in the *Ludus Tonalis* – which as I have mentioned several times, is the quintessential expression of his theory and practice. Therefore, the presence of this symmetrical structure in the first version can be understood as a further reason why he did not feel the need to revise it.

<sup>219</sup> Neumeyer, David, 'Counterpoint and Pitch Structure in the Early Music of Hindemith' (Yale University, PhD, 1976) p. 86. It should be noted, however, that the symmetry applies only to the motivic layout, not the precise number of bars.



Example 6.7: Formal plan of 'Pietà', paraphrased from Neumeier (1976) p. 86.

The only song without a single alteration in the cycle is number 12, 'Stillung Mariä mit dem Auferstandenen'. Unfortunately, in *Introductory Remarks*, Hindemith does not provide an explanation for why this is so: his rationale for leaving a song unrevised could have been at least as informative as those songs that have been revised. It is possible to observe several characteristic *Unterweisung* traits in this piece, however, which can lead to an understanding of why it was unrevised. The song is concise, lasting only 46 bars in duration, with only a single motif which dominates the piece. This central idea, of four bars in duration, is shown in example 6.8.

**Sehr leise, sanft und zart. Leicht bewegte Viertel (100-108)**

Example 6.8: *Marienleben* (1923 and 1948), no. 12, 'Stillung Mariä', bb. 1-6.

The first chord is bimodal, implying both E major and E minor. This effect is identical to fugue twelve from the *Ludus*. The second chord, on the third beat of bar one, is the quartal collection 4-23, although the pitches are arranged to emphasise the two seventh intervals in the set. This interval, together with its inversion as a major second, characterises the rest of the song.

Viewed in isolation, the soprano writing is strongly diatonic, implying E minor, with occasional quartal voice leading, shown in example 6.9. The 4-23 tetrachord is identified by the avoidance of diatonic features, such as a sharpened leading note (D $\sharp$ ) or minor third (G), and emphasis on salient fourths and fifths. The soprano writing in this song is some of the most idiomatic in the cycle, particularly as the piece centres on the same pitch region, which, as a B, sits comfortably in the middle of the soprano voice.

an al - len Stel - len er - stan - den. O zu ihr zu - erst.....

Example 6.9: No. 12 (1948) bb. 16-20, soprano voice leading and pitch implications. The time signatures are not included in the published score.

The two-voice framework, and the associated harmonic fluctuation, also strongly represents the *Unterweisung* spirit with which Hindemith revised other songs in the cycle. A Hindemithian analysis of example 6.10 demonstrates the following:

III.1 III.1

Example 6.10: No. 12 (1948) bb. 1-6, two-voice framework and harmonic fluctuation.

This reduction, faithful to Hindemith's own analyses, is revealing in two ways. Firstly, the 'bi-modal' harmony of the first beat of bar one *and* the quartal, 4-23 pitch collection of bar one beat three may both be categorised as chord group A/III.1, showing that Hindemith provides them with equivalent harmonic value. Secondly, that there is very little harmonic fluctuation at all in the extract. This may have been understood by Hindemith as an appropriate response to the text of the song, 'Consolation of Mary with Christ Arisen': the music is static and calm. The passing

augmented fourth on the fourth quaver beat of bar two is the furthest point of departure, although this has little background significance as the point of least metrical salience.

As in 'Pietà', and given that Hindemith did not significantly change the song, the expression markings have also remained unchanged. This includes the lack of a time signature, which Hindemith would likely have added should he have revised parts of song. In the previous example, 6.10, Hindemith would have notated four different time signatures, had this been a new or revised work. The constantly changing time signature, which characterises this song, bears similarities with Hindemith's early 1920s compositions, such as the fourth movement of the *Sonata for Solo Viola*, op. 25/1. In this sense, it is surprising that Hindemith did not revise the metric structure to conform to a more regular pattern. The background Series 1 distribution is also clear. The work is a simple ternary form (ABA<sup>1</sup>), beginning with a pitch centre of E, with a contrasting middle section in E $\flat$ , before returning to E. These centres correspond to Hindemith's overall leitmotif design, whereby E refers to Jesus and E $\flat$  refers to purity (see table 6.2).

## **6.5 General material with revisions of voice leading and chords**

Hindemith's most common form of *Marienleben* revision was to retain the essence of each song, while changing various aspects of voice leading, soprano writing, key symbolism and harmonic fluctuation. The following example is a comparison of a passage within song eight, 'Rast auf der Flucht in Ägypten', which highlights a common contrapuntal revision.

4

1923 Die-se, die noch e - ben a - tem - los flo - hen mit - ten aus dem Kin - der

1948 Die - se, die noch e - ben a - tem - los flo - hen mit - ten aus dem Kin -

Example 6.11: Comparison of *Marienleben* (1923 and 1948), No. 8, 'Rast auf der Flucht in Ägypten', bb. 4-9.

Apart from subtle changes to the voice leading and word setting, and fewer expression and performance markings, the most notable change in this example is the piano chord progression. Why would Hindemith need to lower the second line in the right hand by a minor third? The left hand remains unchanged, and the aural impression of the two versions is very similar. Two possible rationales are voice leading and harmonic clarity, both of which are related to *Unterweisung* practice. In the first instance, Hindemith's detailed work on voice leading, as found in both the codification of 'two-voice framework' in *Unterweisung I* (1937), and then throughout *Unterweisung II* (1939), precipitated, or was precipitated by, a greater concern for voice leading which conformed to many of the strict rules of species counterpoint. These voices are isolated in example 6.12, which shows how, in the 1923 version, the D minor chord at bar 8/9 is reached by similar motion between the left hand and the second line in the right hand. In the revised version, this is altered to form greater contrary motion.

The motivation could also be harmonic. In both versions, the chords comprise pc-set 3-9, the Hindemith trichord: and should therefore need no harmonic revision. However, the first version

is arranged so that it is based on consecutive sevenths, which Hindemith categorises as group A/V, whereas the second group falls into his category of A/III. In other words, Hindemith's revisions to these chords result in them changing from a less stable chord category, described as 'indeterminate', to a more stable category. This can therefore be interpreted as an improvement in harmonic clarity.

The image shows a comparison of two piano parts for 'Marienleben' (No. 8), measures 4-9. The top system is the 1923 version, and the bottom system is the 1948 revision. Both are in 5/6 time. The 1923 version is labeled 'Upper Voice Removed' and 'Neighbour Note'. The 1948 version is labeled 'Upper Voice Removed' and 'Contrary Motion'. Arrows indicate 'Similar Motion' and 'Contrary Motion' between the two systems.

Example 6.12: Comparison of *Marienleben* (1923 and 1948), No. 8, piano part isolated, bb. 4-9.

With a similar agenda, Hindemith alters the voice leading design of passages from the first song, *Geburt Maria*. In both versions, Hindemith sets contrasting harmonic and motivic material from bar 21 to accompany the text, 'in dieser Nacht wird dem Knaben'. In the first version, there is a combination of pitch collections of high cardinality and quartal voice leading typical of Hindemith's music from the early 1920s. The first bar contains all twelve pitches, with a doubling of F# on the first beat. However, these notes are written in such a way as to imply quartal harmony: one interpretation of the right hand, for example, is three successive 3-9 trichords. Hindemith also appears to be exploiting the 'black note' pentatonic scale, a device also found in the *Suite 1922*, 'Ragtime' bars 46 and 88.

It is therefore difficult to account for the alterations that Hindemith made to this passage in *Marienleben II*, as it is characteristic of the those early compositions that he included in the

*Unterweisung* appendix. In the second version Hindemith writes a clearer ascending and descending melody in the right hand of the piano, which could be one explanation. There is also a greater harmonic journey, afforded by the second crotchet beat of bar 24. This is characteristic of Hindemith's *Unterweisung*-style phrases that begin with harmonic stability, move to a point of greater dissonance – judged by Series 1 and 2 criteria – and then return to relative consonance.

The phrase structure is more theory-based, and less abstract than *Marienleben I*. However, the element most retained from the early to post-*Unterweisung* music is the use of quartal pitch collections. These are present in the right hand of the piano in bars 22 and 24 of 'Geburt Mariä II'. They are used with greater restraint, however, than in the first version. Furthermore, quartal chords are integrated more significantly into the background structure of the song, as opposed to the foreground decoration of *Geburt Mariä I*. This includes changing the pitches of bar 22, second beat, to the pentatonic collection 5-35.

### 1923

21 *dolce*  
 in die - ser Nacht wird dem Kna - ben

### 1948

21  
 in die - ser Nacht wird dem Kna - ben die Mut -

Example 6.13: 'Geburt Mariä' comparison, bb. 21-26.

These revisions introduce a surprising element: polytonality, which was refuted in the *Unterweisung*.<sup>220</sup> The left hand of bar 24 in ‘Geburt Mariä II’ implies an incomplete F seventh chord. However, about it the pitches move around the scale of E major/ C# minor. The next bars complicate this relationship further, as the left hand begins with an A major triad, to accompany a scale implying F major/ D minor. This is followed by a B minor triad in the left hand against an implied scale of Bb major.

## 6.6 Case study 1: a full song with regular, yet minor revisions: ‘Mariä Heimsuchung’

The fourth song of the cycle, ‘Mariä Heimsuchung’, was revised thoroughly, although it maintained its character and background structure. Hindemith’s comments in the foreword to *Marienleben II* are as follows:

The only changes in the next two songs, the “Visitation of Mary” (No. 4), and “Joseph’s Doubt” (No. 5), are slight shifts in individual tones or groups of tones, and other minor alterations, in the interest of clearing up the harmonic and melodic texture, but without touching the substance of the songs.<sup>221</sup>

The pitch centre of the work was altered from F to B to coincide with the overall scheme for the cycle. Hindemith also clarified the tonality, including more root progression triads. For example, the opening two-bar piano introduction is transposed, with a few alterations, up a tone, shown in example 6.12. The transposed version outlines a clear triad in B, whereas the first version played on an almost bitonal ambiguity, which ends on a dyad of Bb-D in the right hand and E-G# in the left hand.

Despite the transposition of the piano introduction, when the soprano enters in bar three, it is at the same pitch in both versions. This seems to contradict Hindemith’s transposition of the piano part, and the associated key symbolism. In *Introductory Remarks*, Hindemith writes that B is associated with Mary, and as the fourth song is concerned with the ‘visitation’, it is clear why he

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<sup>220</sup> See *Craft* (1942) pp. 152-156.

<sup>221</sup> Hindemith, Paul, *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948) p. 7.

has transposed the opening.<sup>222</sup> However, the original soprano line outlines more closely the pitches of A, E and D. One possible reason why Hindemith did not change this soprano passage is that these central pitches may function within a quartal collection containing B, to form pc-set 4-23.

This introduces one of the peculiarities of Hindemith's revisions: that he can alter the piano or soprano line, without altering the other part. This song contains many revisions to the soprano line, and yet with the same accompaniment, an operation which is occasionally possible within Hindemith's musical language. Two examples are offered below:

1923  
8  
und dann stand sie, at - mend, auf den hohn... Ju - den - ber - gen.

1948  
9  
p  
mf  
und dann stand sie, at - mend, auf den hohn... Ju - den

Example 6.14 bb. 9-12, 'Mariä Heimsuchung'.

While the general contour of the soprano line in the first bar of the example (corresponding to bar 8 in 1923 and bar 9 in 1948) is similar, outlining a B minor triad, the horizontal placement is shifted. The fourth dotted crotchet beat in the first version starts with a D, while in the second it contains a B. In the first version, this D forms the fourth note of pc-set 4-23 with the piano

<sup>222</sup> Ibid., p. 11.

accompaniment. In the second version, the B is a simple doubling of the lowest voice, which simplifies the harmony.

A comparison of these versions shows that the second version is simplified and more direct, despite being of identical length. Hindemith has added two pedal points in the piano left hand, which clarifies the central pitch of each phrase. There is also a clearer counterpoint between the two upper voices of the piano part, which traces a stronger descending chromatic pattern and harmonic fluctuation.

The image displays two musical systems for comparison. The top system, labeled '1923', shows a vocal line and a piano accompaniment. The vocal line begins with a rest followed by the lyrics 'Noch erging sie'deicht im An-be-gin-ne,'. The piano part features a complex texture with multiple voices and dynamic markings 'p zart' and 'pp'. The bottom system, labeled '1948', shows a similar vocal line and piano accompaniment. The vocal line is identical. The piano part is significantly simplified, with a more direct harmonic structure and dynamic markings 'p' and 'p'. The piano part in the 1948 version includes two pedal points in the left hand, which are absent in the 1923 version.

Example 6.15: comparison of 'Mariä Heimsuchung', bb. 1-4.

Hindemith adjusts the melodic shape of the soprano part throughout the song. This is likely to have been motivated by a desire to make the soprano line more idiomatic. In his *Introductory Remarks*, Hindemith offers a detailed discussion of the problems with the soprano writing in *Marienleben I*, and how he went about solving them in *Marienleben II*. He begins by stating that 'one of the most conspicuous weaknesses of the old version was the slight attention it paid to the possibilities and requirements of the singing voice'. He also admits that 'the path of the vocal line

was in very many instances dictated by other than vocal considerations', and then outlines these problems more specifically stating that the vocal line 'included progressions difficult (and sometimes almost impossible) to encompass, unassimilated chromaticisms, awkward intervals, and elements tonally incommensurable'.<sup>223</sup>

This last statement shows how far, aesthetically, Hindemith had come since his provocative early works of the 1920s. The fourth movement of the *Sonata for Solo Viola* op. 25/1, for example, was to be performed at crotchet = 600-640, and demotes 'tonal beauty' to a secondary status. And yet, paradoxically, both this sonata and the *Marienleben* revisions were included in Hindemith's *Unterweisung* appendix of 1937. This suggests that Hindemith had included these two works in the appendix for separate reasons, such as popularity or political idealism.

And yet the pitch alterations also affect the soprano's counterpoint with the piano, a fact that Hindemith would certainly have been aware of. The following example shows an instance where the soprano part will have been changed to make it more singable: the descending sixth has been removed, in favour of a more conjunct melody line. That the piano counterpoint remains the same, results in greater harmonic clarity, where the sixth of the triad is removed. This has the effect of making the passage sound far more tonal than the original version. It is hard to explain this revision as relating to the *Unterweisung*, as it has originated from a desire to simplify the vocal line, and yet has further simplified the harmony and counterpoint.

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<sup>223</sup> Ibid., p. 4.

5  
dochimStei - genmanchmalwardsie schonih-reswun - der - ba - ren Lei - bes in - ne,  
1923  
pp  
mf  
dochimStei - genmanchmalwardsie schonih-reswun - der - ba - ren Lei - bes in - ne,  
1948  
p  
mp  
mf

Example 6.16: 'Mariä Heimsuchung', bb. 5-8

### 6.7 Case study 2: similar basic outline, yet significant background revisions: 'Die Darstellund Mariä im Tempel' and 'Verkündigung über den Hirten'

Three songs in *Marienleben II* underwent regular and significant revisions, and yet retained similar outlines, including number 2, 'Die Darstellund Mariä im Tempel', number 6, 'Verkündigung über den Hirten', and number 9, 'Von der Hochzeit zu Kana'. A study of significant background revisions shows the presence of Series 1 relationships, key symbolisms, and a clearer approach to harmonic fluctuation.

'Die Darstellund Mariä im Tempel I' is a passacaglia, a form that Hindemith also used as the basis to the fourth movement from the *Fifth String Quartet* op. 32 (1923). The revised version retains the character of the passacaglia bass line, compared in example 6.17, which Schubert interprets to represent the grand structure of the temple.<sup>224</sup> However, the voice leading is changed substantially. In 'Tempel I', the soprano part and the bass part each cover all twelve pitches of the chromatic scale. Given that this is found within a single phrase, it is likely to have

<sup>224</sup> Schubert, Giselher, 'Paul Hindemith' *New Grove Online*, accessed 16 April 2013.

been a conscious compositional device. The revised version has ten different pitches in the bass line, by removing D and F. The soprano part has nine different pitches, omitting the quartal 3-9 trichord made from E $\flat$ , F and B $\flat$ . Similar to the soprano writing in song 12, ‘Stillung Mariä mit dem Auferstandenen’, the melody is tonal, and yet ends with reference to quartal pitch material.

The original passacaglia bass line comprises of four adjacent fifths in the voice leading, within a chromatic context, which was typical in Hindemith’s 1920s style. That Hindemith chose to rework this passage parallels his revision of *Geburt Mariä*, bars 21-26 (ex. 6.13), whereby the prominent foreground quartal collections were replaced in favour of a clearer background scheme. The revised passacaglia bass line possesses a clear theoretical structure. A Series 1 analysis, with vertical lines corresponding to Hindemith’s phrase markings, shows that Hindemith typically begins and ends with stability, with harmonic tension in between. The salience afforded by the beginning of each phrase confirms this on a background level, shown below. As the tempo of the second version is notably faster, this background design is more audible.

**Foreground:**

[0, 1, 6 | 0, t, e, 1, 8 | 3, 6, 9, e | 6, 3, 4, 9, 5, 0]

**Background:**

[0 | 0 | 3 | 6 | 0]

Where 0 is the first degree of Series 1, and e the eleventh and final degree.

1923

Passacaglia. Ziemlich langsame Viertel (40-46)

Um zu be - grei - fen, wie sie da - mals war, muß du dich erst an ei - ne

Stel - le ru - fen, wo Säu - len in dir wir - ken,

*p sempre legato*

tritone

1948

Ziemlich langsam (♩ etwa 66)

Um zu be - grei - fen, wie... sie da - mals war, muß du dich erst an ei - ne Stel - le

ru - fen, wo Säu - len in dir wir - ken,

*mp*

*p*

Example 6.17: comparison of the passacaglia bass line from 'Die Darstellund Mariä im Tempel'.

The revisions also make the song more tonal. For example, the final chord consisted of a C, with three octaves doubling. In the revision, Hindemith adds an E to the chord, which emphasises not only the pitch centre of C, but the tonality of C. The revision to the harmonic fluctuation

simplifies the final progression, by lowering the value of the penultimate chord from group one to four. This is particularly significant in Hindemith's theory, as the new chord does not contain a tritone, which distinguishes between groups A and B.

The image displays two musical systems for the piece 'Die Darstellund Mariä im Tempel'. The top system, dated 1923, is marked 'Ritenuito' and features a vocal line with the word 'Haus.' and piano accompaniment. The piano part includes chords labeled A/III.1 and B/IV.2. The bottom system, dated 1948, shows a revised version with a vocal line containing the words 'als das Haus.' and piano accompaniment with chords A/III.2 and A/I.2. The 1948 version shows a simplified harmonic progression compared to the 1923 version.

Example 6.18: the final three bars of 'Die Darstellund Mariä im Tempel'.

In *Introductory Remarks*, Hindemith writes the following concerning the revisions to 'Verkündigung über den Hirten':

...the musical substance is approximately the same in both versions, and yet this is the song that has been subjected to more changes in its inner structure than any other. It will always be a compositional problem of the first order to set so many significant words to an equivalent music, especially when the means of expression are confined to a soprano voice with piano accompaniment. Nevertheless, the original version of this composition seemed to me so convincing that I sought by every means to work the text into the form I had originally imagined. Here too, it appears to me unnecessary to describe every detail of the changes made. A comparison of the two versions will show the first and the final stages in the technical evolution of the song, from which an approximate picture of that process may be inferred.

These comments invite a comparative study of the two versions, although it is infuriating that Hindemith does not elaborate more precisely on the nature of his revisions. It is also relevant that the revisions to this song are perhaps the most stylistically different. Hindemith's approach to revision in 'Verkündigung' prioritises key symbolism, soprano voice leading and a simplified,

more tonal, piano part. The revised song is also a substantial 87 bars longer, although at a slightly faster tempo marking. While the general pitch centre of A remains throughout both songs, Hindemith transposes the first piano introduction up a fifth in his revision: this is at odds with the soprano part, which is transposed up a tone. The discrepancy between the transposition of the soprano and the piano part parallels that found in ‘Mariä Heimsuchung’, example 6.16.

The piano part is greatly simplified by the revision process. The following comparison shows that Hindemith even introduces a period of silence in the piano part in bars 37-38, where there had originally been a busy quaver passage with octave doubling. Hindemith also uses bass pedals, similar to his revision of ‘Mariä Heimsuchung’, in bars 25-26, 28-29 and 30-31, which clarify the harmonic progression. To allow for these changes, the passage is also lengthened. The bass part to the first version consists of regular foreground quartal patterns in the voice leading, similar to songs 1 and 2. These are revised with a clearer background structure, achieved by pedal points and simple voice leading patterns.

18 **Von hier an sehr bewegt** ( $\text{♩}=84-88$ )

*mf*

Seht, ich bin ein neu - er - stei - gen - der Stern. Mein

1923 *p sempre staccato*

5-35 4-23

23 **Lebhaft** ( $\text{♩}=100$ )

*f*

Seht, ich bin ein neu - er - stei - gen - der Stern. Mein

1948 *mf*

The image displays two systems of musical notation for a vocal and piano piece. The first system, starting at measure 23, shows a vocal line in treble clef with lyrics: "gan - zes We - sen brennt und strahlt so stark und ist so". The piano accompaniment is in bass clef, with three measures of a 4-23 chord structure highlighted by boxes. The second system, starting at measure 28, shows a vocal line with lyrics: "gan - zes We - sen brennt und strahlt so stark". The piano accompaniment continues with similar rhythmic patterns.

Example 6.19: comparison of 'Verkündigung über den Hirten', bb. 18-27/ 23-32.

Hindemith introduces a substantial amount of new material to the song. Most notable is a passage from bars 158-174, which is built on an ascending sequence, and shown below in example 6.20. Sequences were rare in the more abstract and less regular early music: Hindemith subverted expectations. In these revisions, he does the opposite. The structure of the sequence is based around an ascending scale pattern of 3-9 trichords, which is shown in the reductive analysis of example 6.21. The voice leading between the four part texture in bars 166 and 169 is typical of Hindemith's theoretical style. The third beat of bar 169 consists of a quartal tetrachord, 4-23, which resolves in contrary motion to a bare fourth: this relates it to Hindemith's concept of two-voice framework and harmonic fluctuation.

158 **Breiter** (♩ 88-92)

*p* Und wenn ein Dorn-ge- sträuch auf - flamm-te plötz -

*mp*

8 *mf* lich, dürf - te noch aus ihm

13 *ff* *Sehr breit* der E - wi - ge euch ru - fen, Che -

Example 6.20: 'Verkündigung' (1948) bb. 158-174, sequence.

158 162 165 173 174

3-9 → 3-9 → 3-9 → 3-9

x 2

Example 6.21: 'Verkündigung' (1948) bb. 158-174, sequence, voice leading reduction.

### 6.8 Case study 3: a fully reworked song, bearing no similarities to the original: 'Geburt Christi'

The seventh song, 'Geburt Christi' (Nativity of Christ), was completely revised between the two versions. There are no similarities between motif, text setting, or structural planning. In the 1948

foreword, Hindemith describes 'Geburt Christi' as the weakest song from the original cycle.<sup>225</sup>

He writes:

Not only was its melodic material of slighter value than that of the other songs, but it was harmonically unclear, in that neither the fluctuation nor the density, and in the sphere of tonality neither the tonal design of the whole nor the amplitude of tonal deflection, was carefully enough calculated. In addition, it was wide of the mark as regards expression, since its scherzando character conflicted disturbingly with the contemplative, somewhat resigned bearing of the text. The song that replaces it in the new version seeks to avoid all these weaknesses.

This shows that Hindemith was actively concerned with the ordering of harmonic fluctuation and tonal amplitude: both of which are directly connected to the *Unterweisung*. Tonal amplitude may be connected to Hindemith's hierarchy of pitches in Series 1, while harmonic fluctuation is based on chord value, which is based directly on the interval hierarchies of Series 2. He also mentions expression and character in this paragraph – while these are harder to connect to the more scientifically-based theories in the *Unterweisung*, they are nevertheless symptomatic of Hindemith's post-New Objectivity style, which included more conservative, clearer expression markings and performance directions, and a more direct compositional style. Time signature changes are notated, rather than implied, such as the change from 3/4 to 2/4 in bar 29 of *Marienleben I*. Hindemith's orchestration of this song further clarifies the tonality. The opening elaborates on the original piano chords using scales, which create a stronger opening gesture. These scales define E more clearly, as they include an F# not found in *Marienleben II*.

The first setting of the 'Geburt' text, included in full below, was characterised by an uplifting tempo (crotchet = 108-112) and performance direction (Freudig bewegt – joyfully moving). This character could have been inspired by the ninth line of the text, 'Look at yonder, see! these kings are great'. Before this line, however, the emphasis of the text is one of mildness and humility, whereas after this point it switches to greatness. The general character, as Hindemith states in his 1948 foreword, was originally scherzando, becoming far more contemplative in the revised version. *Marienleben II* sets this text at a more stately tempo (crotchet = 72), although the music is

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<sup>225</sup> Hindemith, Paul, *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948) p. 8.

less heavy, with the omission of the accented passage at bar 31, shown in example 6.22. This also shows that lines 3-4 of the text are more sombre within the music, compared with the far more declamatory setting in *Marienleben I*. Hindemith also emphasises different words in ‘Geburt II’, including ‘Völkern grollte’ (bars 13-15) and ‘Aber du wirst sehen’ (bars 150-152). The text of ‘Geburt Christi’ is as follows:

<sup>1</sup>How could that be, if thou wert less than childlike,  
<sup>2</sup>that be to thee, which makes the night now bright?  
<sup>3</sup>Lo, the God, who judged the nations, mildlike  
<sup>4</sup>shines and doth in thee on earth alight.  
<sup>5</sup>Didst picture him as greater than a mite?  
<sup>6</sup>What is greatness? Every standard clean through,  
<sup>7</sup>which he traverses, goes his onright gait.  
<sup>8</sup>No such orbit even stars have been through.  
<sup>9</sup>Look at yonder, see! these kings are great,  
<sup>10</sup>and laden they before thy lap do wait  
<sup>11</sup>with gifts, which they regard as greatest payment,  
<sup>12</sup>and mayhap on thee this bounty tells -:  
<sup>13</sup>but look into the folding of thy raiment,  
<sup>14</sup>and see how he already all excels.  
<sup>15</sup>Amber, shipped from far and what-not else,  
<sup>16</sup>ornament of gold and spices pleasant,  
<sup>17</sup>which steal into the sense with dulling breath:  
<sup>18</sup>all of this was passing evanescent,  
<sup>19</sup>and at the end “Repent!” thy spirit saith.  
<sup>20</sup>But (thou wilt taste and see): He gladdeneth.<sup>226</sup>

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<sup>226</sup> Ibid., p. 17.

**Marienleben I (1923)**

3rd line  
↓

26 *f*

Sieh, der Gott, der ü - ber Völ - kern groll - te,

4th line  
Breit ↓

30 *ff*

macht sich mild und kommt in dir zur Welt.

**Marienleben II (1948)**

11 *mf* *p* Leicht bewegt (♩ bis 72)

Sieh, der Gott, der ü - ber Völ - kern groll - te, macht sich

Marienleben motif

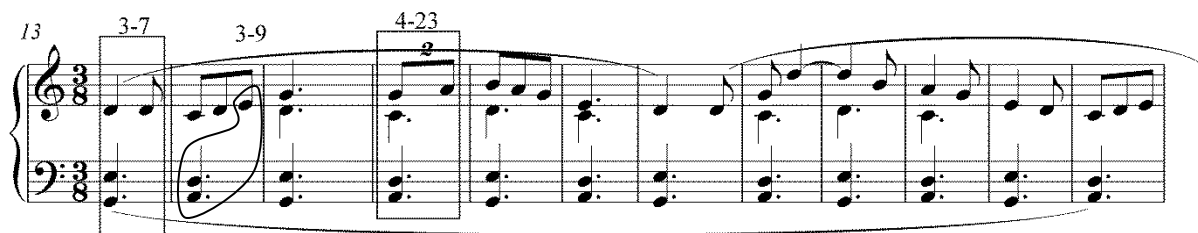
17

mild und kommt in dir zur Welt.

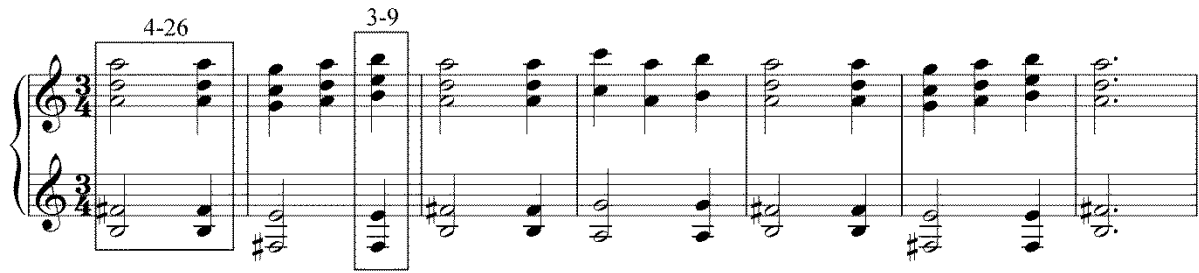
Example 6.22: Comparison of 'Geburt Christi' (1923 and 1948) bb. 26-33 and 11-24.

In this song, Hindemith refers to the opening motif of the entire cycle, described by Neumeyer (1986) as the ‘Surrexit Christus’ motif, which he shows to be based on a violin motif from Heinrich Biber’s ‘Die Auferstehung’ (The Resurrection) sonata.<sup>227</sup> The motif appears from bar 13 of ‘Geburt II’, albeit slightly modified from its original form, shown in example 6.23. The general character is unmistakable, including triple metre, melodic contours, and a repeating two-bar bass line, which is harmonically static. The pitch collections, while not identical, also follow a similar pattern. Bar 13 of ‘Geburt II’ forms pc-set 3-7, which is an incomplete quartal collection, missing an A, which would complete 4-23. The final beat of the second bar of the motif, similar to the opening of the complete cycle, creates the quartal collection 3-9. However, the approach to pitch collections differs in the fourth bar, where the complete quartal collection 4-23 is formed.

The use of the ‘Surrexit Christus’ motif in *Geburt II* shows that Hindemith was thinking much more in terms of leitmotif, or unifying structural ideas, than in the first cycle. It also shows that, on lines 3 and 4 in the text, he wanted the listener to be reminded of birth: the first song of the cycle is about the birth of Mary, the seventh about the birth of Jesus. This is another example of how Hindemith’s style had become more direct.



<sup>227</sup> Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) pp. 146-147. His comparison between the melodic contours of ‘Surrexit Christus’ and *Marienleben* is convincing, whether Hindemith consciously intended the similarity or not.



Example 6.23: comparison of the opening to song 1 of *Marienleben* with *Marienleben II*, No. 7 bb. 13-24.

All of these factors suggest that ‘Geburt II’ is a more conservative, rational and method-based work. It shows that Hindemith was acting less instinctively and more academically, and theoretically, than in his 1920s compositions. Moreover, the different sections of the song are explicitly differentiated. In *Marienleben I*, the character changes more seamlessly: the composition is more abstract and asymmetrical.

In the revised version, the structure and general characteristics of the song may be represented in a table. The pitch centres of each section are clear, and create a Series 1 order of [0, 1, 6, 0]. This is a common order, with the zone of greatest distance (C) taking place approximately three quarters of the way through the piece, before a return to the original pitch centre at the end (albeit in the major mode). The strongest example of this concept in the *Unterweisung* may be found in Hindemith’s ‘practical application’, where, in a passage of nine chords, he describes a ‘harmonic crescendo’ to chord five, followed by a ‘harmonic diminuendo’ to chord nine.<sup>228</sup> In the first song, such an explicit structure is absent, and its presence within a table is harder to justify.

	Bar	Time Signature	Performance Direction	Pitch Centre	Lines of text
A	1-12	3/4	♩ = c. 72, Breit	E	1-3
B	13-92	3/8	♩ = 72, Leicht bewegt	B	4-12
C	93-	2/4	♩ = 126, Ruhig bewegt	C	13-19
A <sup>1</sup>	150	3/4	♩ = c. 72, Wie am Anfang	E	20

Table 6.4: structural synopsis of *Marienleben II*, song no. 7, ‘Geburt Christi’.

<sup>228</sup> Craft (1942) p. 158.

## 6.9 *Lieder nach alten Texten/ Five Songs on Old Texts*

The *Marienleben* revisions have understandably commanded scholarly attention due to the length of the work, the proximity of the revisions to the *Unterweisung*, and the revealing foreword to *Marienleben II*. However, there is an opportunity to contextualise this against another composition, which was revised at a similar time, and which was also included in the 1937 *Unterweisung* appendix: *Lieder nach alten Texten*, op. 33 (1923), revised as *Five Songs on Old Texts* (1936-7). This is particularly insightful for a study of Hindemith's revisions to counterpoint. This cycle has received scant attention in even the most seminal studies of Hindemith's music in the English language, such as Skelton (1975), Neumeyer (1986), and Noss (1989).

The revisions first appeared as *Four Songs on Old Texts* first appeared in a concert in Washington, USA on 9 April 1937, sung by the Madrigal Singers, directed by Paul Boepple.<sup>229</sup> Other items in the programme included Hindemith's *Sonata for Solo Viola* op. 25/1, *Third Piano Sonata* and four of the Hölderlin poems from *Six Songs for Tenor and Piano* (1933-5). Following the success of this premiere, a fifth song was added at the request of Hindemith's publishers, which was to become the first song, 'True Love' of the final cycle *Five Songs on Old Texts*. The English translations were made by W. Strunk, Jr, with the exception of the new song, which was translated by Arthur Mendel. This is ironic, as Strunk, one of the founders of American musicology and a student of Johannes Wolf and Robert Kahn in Berlin, was failed by Hindemith when he took an entrance exam in composition to the Berlin Musikhochschule.<sup>230</sup>

Apart from the Hölderlin settings, all of these works from Hindemith's Washington concert programme were included in the *Unterweisung* appendix of 1937, which is unlikely to have been a coincidence. The revisions to the four songs from *Lieder* op. 33 took place in 1936, which coincided exactly with the completion of the first version of the *Unterweisung*, and so the revisions

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<sup>229</sup> Skelton, Geoffrey, *Selected Letters of Paul Hindemith* (New Haven: Yale University Press, 1995) p. 100.

<sup>230</sup> *Ibid.*, p. 100. Today, Strunk is more widely known by his other first name, Oliver.

must have been saturated with Hindemith's musico-theoretical concerns. In general, apart from the revisions necessary to change the word setting from German to English, Hindemith made only small adjustments. However, they provide rare insights into Hindemith's approach to five-part composition.

Hindemith's *Lieder* op. 33 contained six songs, listed in the table below. Three of these were revised for the *Five Songs on Old Texts*, and the order of the final two songs is switched, to provide a different ending to the cycle. The relevant questions raised by Hindemith's revisions are:

1. Why did he keep three songs, and not the others?
2. Why, and how, were these songs revised?
3. How does this enquiry relate to the *Unterweisung*?

<b>Lieder nach alten Texten op. 33 (1923)</b>	<b>5 Songs on Old Texts (1937-8)</b>
<b>Frauenklage (Burggraf zu Regensburg)</b> <b>Vom Hausregiment (Martin Luther)</b> <b>Art läßt nicht von Art (Spervogel)</b> Der Liebe Schrein (Heinrich von Morungen) Heimliches Glück (Reinmar) <b>Landsknechtstrinklied</b>	True Love <b>Lady's Lament</b> <b>Of Household Rule</b> <b>The Devil a monk would be!</b>  <b>Trooper's Drinking Song</b>

### **'Frauenklage' (Lady's Lament)**

Unlike *Marienleben II*, there is no helpful foreword explaining Hindemith's revisions. This may have been because the cycle is more modest in scope, lasting approximately eight minutes in performance, and that the revisions themselves are less substantial. The small adjustments in the opening phrase indicate that Hindemith was thinking within a tonal or modal framework. In both settings the phrase ends on an A major triad. However, in the revised version, the B $\flat$  is removed from bar two, and the F and C pitches are sharpened. In the first version, a false relation is created by the B $\flat$  in the alto clashing with the B $\sharp$  in the soprano in bar 2. While the A major triad in bar three is a clear destination for the opening phrase, it is destabilised by the G $\sharp$  in the second soprano part, creating a modal effect. In the revised version, this modal ambiguity

remains throughout bar two, but the cadence in A major in bar three is tonal, without any destabilisation. This can be related to Hindemith's *Marienleben* revisions: the music is more direct, particularly at cadences, and the voice leading is altered to make it more idiomatic. This is also shown in the second phrase, from bars three to five, where the stretto voice entries are revised to provide a clearer, more tonal framework.

The change in expression markings further the notion that Hindemith composed more sensitively for the voice from the *Unterweisung* years onwards. The addition of crescendos and diminuendos in example 6.24 are written in a way that makes the parts easier and more instinctive to sing, by increasing dynamic levels with higher tessitura.

### 1<sup>st</sup> Version, Lieder op. 33

**Ruhige Viertel**

S1 *p* Nun hei-ßensie mich mei - den *mf* ei-nen Rit - ter, den ich mag.

S2 *p* Nun hei - ßen sie mich mei - den *mf* ei-nen Rit - ter, den ich mag.

A *p* Nun hei - ßensie mich mei - den *mf* ei-nen Rit - ter, den ich mag.

### 2<sup>nd</sup> Version, Five Songs

**In quiet and steadily flowing quarters**

S1 *p* They say I must be part - ed From the knight who is my joy.

S2 *p* They say I must be part-ed From the knight who is my joy.

A *p* They say I must be part - ed From my lov - er, all my joy.

Example 6.24: comparison of 'Frauenklage', bb. 1-5.

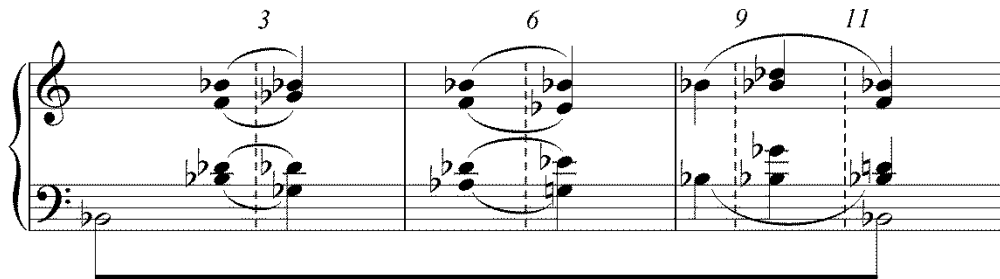
## 'Art läßt nicht von Art' (The Devil a monk would be!)

While the two versions bear the same text, Hindemith rewrote much of his setting. There are vague similarities, such as the emphasis on B $\flat$  from the opening, and the final pitch of G. Hindemith also retained some of the accented quavers, such as the setting of the text 'Er biß die Schaf'. However, this song is notable for its substantial revisions. These include a simplification of the counterpoint, and the removal of semiquaver passages that are demanding for the singer, such as the tenor line from bars 13-16. Hindemith also changed much of the voice leading, and increased the number of voices from four to five, which allows pedal points to be added to four part texture for harmonic clarity. Below is a comparison of the final cadence, which is preceded by a progression of quavers. In the first version, the voice leading is good by Hindemith's theoretical standards: there is plenty of contrary motion between parts, and they move in small steps. In the main, they are not hard to sing. However, the consecutive fourths and thirds in the revision create a clear pattern, which forms a sequence. This sequence is derived from only one chord type, represented by pc-set 4-22: one of Hindemith's incomplete quartal sets. The original was less ordered.

The image shows two musical staves comparing the final cadence of the piece. The top staff, labeled '1923', shows a piano accompaniment with a treble clef and a bass clef. The melody in the treble clef consists of a series of eighth notes: G4, A4, B4, C5, B4, A4, G4. The bass clef part consists of a series of chords: G4-B4, G4-B4, G4-B4, G4-B4, G4-B4, G4-B4, G4-B4. The bottom staff, labeled '1938', shows a piano accompaniment with a treble clef and a bass clef. The melody in the treble clef consists of a series of chords: G4-B4, G4-B4, G4-B4, G4-B4, G4-B4, G4-B4, G4-B4. The bass clef part consists of a series of chords: G4-B4, G4-B4, G4-B4, G4-B4, G4-B4, G4-B4, G4-B4. The 1938 version is characterized by a sequence of chords in the bass clef, with a '3' and a '4' indicating the number of notes in the sequence. The 1923 version is characterized by a sequence of eighth notes in the treble clef.

Example 6.25: comparison of the final cadence from 'Art läßt nicht von Art'.

The new setting is far more tonal, although despite the clear definition of B $\flat$  major, Hindemith does not use a key signature. The opening section, from bars 1-11, while containing advanced harmonies within each phrase, is characterised by clear background, tonal harmony. This may be expressed as:



Example 6.26: 'Art läßt nicht von Art', bb. 1-11, voice-leading reduction.

### **'Landsknechtstrinklied' (Trooper's Drinking Song)**

Hindemith's second version of 'Landsknechtstrinklied' contains only minor foreground revisions. The general texture is similar between both versions, where the soprano voice carries the motivic material. Unlike 'Art läßt nicht von Art', Hindemith reduced the number of voices in his revision. The tenor counter-melody is removed, presumably as it originally formed strong dissonances with the soprano part. Much of the semiquaver detail is also omitted. The time signature is revised, so that the repeating pattern of 2/8 – 3/8 – 3/8 becomes 8/8.

Hindemith changes the harmony at the beginning of the song to sound more tonal, and less quartal. The cadence again provides a focal point for an examination of Hindemith's revision process. He replaces the quartal chord 4-23 with a bare fifth, B $\flat$ -F. The previous chord is a 'nearly' quartal chord, pc-set 4-26, which is followed by a bass progression of a fifth, implying an altered plagal cadence. This section is also preceded by a B $\flat$  pedal, which was not present in the original.

65  
1923  
4-23

36  
1938  
chromatic

Example 6.27: comparison of the final cadence from 'Landsknechtstrinklied'.

The soprano line was altered by Hindemith's revisions, although maintained similar melodic contours. Apart from the change of time signature, Hindemith deleted bars 9-10 of the original, which set the text 'Tummel dich, guts Weinlein'. These originally outlined a G major/ E minor tonal area, which classes as a Series 1 distance of 3. Presumably Hindemith felt that this was too melodically distant for this passage, and focused the subsequent passage, which sets the text 'Das Gläslein soll nicht stille stahn', on E $\flat$ , which is only a Series 1 distance of 2. His revisions therefore simplify the melody of the song, on his theoretical terms.

3  
1923  
Frisch auf, gut G'sell, laß rum-mer gahn. Tummel dich, guts Weinlein.

11  
Das Gläslein soll nicht stille stahn.

1938  
Frisch auf, gut G'sell, lass rum-mer gahn.

5  
das Gläslein soll nicht stille stahn.

Example 6.28: comparison of the soprano parts from *Lieder* no. 6 and *Five Songs* no. 4. The German translation for *Five Songs* is used for this purpose.

## 'True Love'

Hindemith added a new song, 'True Love' to the revised cycle. This short composition merits close attention; it was written during the time that Hindemith was completing the *Unterweisung*, and was placed at the beginning of a cycle that was both included in the *Unterweisung* appendix and the revision of earlier music. Three main approaches to composition make this a quintessential *Unterweisung* composition: the regular appearance of quartal harmony, sensitivity to idiomatic vocal writing, and unambiguous, tonal cadences.

The following piano reduction and reductive analysis highlights *Unterweisung*-influenced approaches to harmony.

**Tranquillo**

The image shows a piano reduction of the first five measures of Hindemith's 'True Love'. The score is in 4/4 time and consists of two systems of staves. The first system contains measures 1 through 4, and the second system contains measure 5. The right hand (treble clef) features complex chordal textures with many intervals of thirds and sixths. The left hand (bass clef) provides a more rhythmic accompaniment. Above the first two measures, the chordal structures are labeled '3-9' and '4-23'. Above measure 4, there is an asterisk '\*'. Below the first two measures, the word 'Solo' is written above the bass line. Fingerings are indicated by numbers 0-9. Measure 5 shows a change in time signature to 3/4.

Example 6.29: Hindemith's *Five Songs*, 'True Love', bb. 1-5, keyboard reduction, omitting the text.

The song begins with salient reference to the quartal trichord 3-9 in bar one, which is extended in bar two to form 4-23. These two bars imply a D minor modality, which is achieved by voice leading in the solo tenor line, and salient chords on the second beats of bars one and two. However, bar three moves abruptly away from this centre. This is achieved by implying a modulation to a flatter key, with the introduction of E $\flat$  and D $\flat$ , although without the intervening Ab. Having started this progression, Hindemith interrupts it with a D $\sharp$  in the bass of bar four.

The implied modulation in bar three may be understood using an *Unterweisung* analysis. Taking D as the generating pitch, the numbers above the tenor solo line in example 6.29 show the varying distances within Series 1. The third bar, consisting of [9, t, 8, 6] is the most distant area, from the pitch centre of D, in the first phrase.

A background analysis of the section highlights this change more clearly. There is no dominant chord, although the voice leading of the phrase emphasises the dominant note, A, in bar four. The approach to counterpoint is conventional, which emphasises contrary motion and the structural use of dominant and tonic pitches, and yet the harmony is not diatonic. This is a common characteristic of Hindemith's compositions that were influenced by the *Unterweisung*. Bar three, identified with a horizontal bracket, is the most distant area of the phrase, according to Series 1, before it then returns to the pitch centre of D in bar 6.

Example 6.30: Hindemith's *Five Songs*, 'True Love', bb. 1-6, voice leading reduction.

## 6.10 Conclusions

Hindemith revised these works because much of their original material anticipated his *Unterweisung* style. If there were no stylistic affinities, Hindemith need not have bothered; he could have written new music. Table 6.3, listing which songs were retained, altered or omitted is therefore an important yardstick for judging which movements Hindemith already felt best represented his theory in practice. We can further assume that the brand new versions: songs

two, three and seven, like the *Ludus Tonalis*, are strong examples of *Unterweisung* practice in free composition.

It is important to note that the impulse to revise the cycle was originally not motivated by musical-theoretical concerns, but by aesthetics. In his *Introductory Remarks* (1948), Hindemith recalls that he considered revising the cycle soon after its premiere, as ‘although in the *Marienleben I* had given the best that was in me, this best, despite all my good intentions, was not good enough to be laid aside once and for all as successfully completed’.<sup>231</sup> It was only during his Berlin years, from 1927-37, that Hindemith would have realised the potential for the revisions to showcase his music theory, and therefore to include the work in the appendix to the *Unterweisung*. These revisions therefore show that Hindemith became more sensitive in later life to the technical details of a composition, in addition to the aural effect.

The most strongly retained characteristic between the two cycles is the use of quartal pitch collections. However, the manner in which they are used is different: they come to have greater control, restraint and melodic emphasis, such as shown in example 6.11, from ‘Geburt Mariä’. Quartal pitch collections, while prevalent in much of *Marienleben I*, were to be afforded a greater background prominence. In bars 21-26 of my analysis of ‘Geburt Mariä’, for example, the regular appearances of foreground quartal trichords (3-9) were replaced by a more lyrical line in the right hand of the piano. In addition to quartal harmony, many of the most theoretically revealing extracts from Hindemith’s music have come from his cadences. This is not surprising, given that the cadence, of all areas of Western art music, is one of the most theorised areas. This has been accompanied by pedal points, which make harmonic progressions more transparent, such as songs four and six.

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<sup>231</sup> Neumeier, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) p. 137.

Several aspects of Hindemith's revisions are not directly related to the *Unterweisung*, but simply to a change in sensibility. These revisions are also perhaps the most controversial, as they significantly simplify the work, and add more predictable counterpoint in the form of pedal points and sequences. The revisions remove some, but not all, of the elements of stylistic disparity, and many recitative sections are reduced, making the work less dramatic and more homogeneous. This may be one of the reasons why song three, 'Mariä Verkündigung', was entirely rewritten. However, Hindemith refers to the fourth and final set of songs as the point of highest abstraction: this concept parallels the compositional approach of his early years, and shows that he retained some expressionistic and dramatic elements, albeit within a larger and more deliberate structural design.<sup>232</sup>

The revisions to *Lieder nach alten Texten* strengthens the notion that Hindemith's *Unterweisung* revisions prioritised a combination of voice leading – 'two-voice framework' – and quartal pitch collections. This effects Hindemith's treatment of cadences, similar to *Marienleben*. One consequence is the removal of dramatic elements, such as the unexpected final chord of 'Landsknechtstrinklied'. The revised songs are much easier to sing, and the lines are more idiomatically vocal, rather than instrumental. However, these songs do not provide clear evidence for Hindemith's theory as applied to five part composition.

If the *Ludus Tonalis* was the ultimate application of the *Unterweisung* to free composition, then the *Marienleben* and *Lieder nach alten Texten* revisions show the theory at its most technical. It puts into practice not the theory in free composition, but the theory as both a diagnostic and corrective tool. This raises the question that Hindemith never explicitly posed in his writings: as he applied his own theory to 'improve', technically, his own compositions, is it not implied that the *Unterweisung* could be somehow used to improve other works, particularly those written in a post-

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<sup>232</sup> Hindemith, Paul, *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948) p. 6.

tonal idiom? This is evident in the tone of his analysis of Wagner's *Tristan* Prelude: 'Here melody yields first place to harmony. It confines itself for the most part to steps of a second and broken-chord formations. Thus nothing remarkable in the way of either melody degree-progression or step-progression can arise.'<sup>233</sup> Hindemith, it seems, thought that all composers could benefit from thinking more theoretically.

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<sup>233</sup> *Craft* (1942) p. 215.

## Chapter 7: A Case Study of *Unterweisung* Reception: *The Music Review*

The main academic journal in the English language for publication on Hindemith's theories was *The Music Review*, published annually in Cambridge from 1940–1994. It lasted 55 volumes, before being revived in 2004 as *Nineteenth-Century Music Review*. That Hindemith's theories came to be discussed in unparalleled detail in this periodical occurred not by any obvious design, but by the succession of a number of strongly-worded and provocative polemics. These comprise the most detailed discourse available on Hindemith's theories, including articles by Norman Cazden and Rudolf Stephan (1954), Victor Landau (1960 & 1961), Hans Redlich (1964), Richard Bobbitt (1965) and Clifford Taylor (1983). The founding editor of *The Music Review* was Geoffrey Sharp, who remained until 1974, thus approving all but one of these articles, after which time A. F. Leighton Thomas took over editorship of the journal. It is not clear whether Sharp had an agenda against Hindemith's music, although it does seem more than coincidental that a body of negative, and detailed, literature appeared in a single journal. Apart from a small selection of articles in English in the *Hindemith Jahrbuch*, the *Musical Quarterly* and *Journal of Music Theory*, other committed discussions of Hindemith's theories took place in the German language, under the pervasive influence of Theodor Adorno and the Darmstadt School. While there are also entries to be found in *The Musical Times*, these are generally of a journalistic and brief nature, as is the case with numerous magazine reviews, without serious critical engagement with the *Unterweisung*. A study of the articles in *The Music Review* is therefore representative of the English language reception of, and engagement with, Hindemith's music theory.

With the exception of Taylor, these articles strongly criticise Hindemith, aiming to show that he was:

1. a poor theory builder (Cazden and Bobbitt)
2. a poor and unnecessary reviser of his own music (Stephan)
3. an inconsistent follower of his own rules (Landau)
4. a Nazi sympathiser (Redlich)
5. a flawed and unoriginal mathematician (Bobbitt)

Given the importance of *The Music Review* for English-language Hindemith publication, these criticisms are especially damaging. However, many aspects of these articles are unfair, or inaccurate, in the following ways:

1. Cazden was influenced by his training at Harvard with Walter Piston, who disapproved of speculative, acoustic music theory
2. Landau's method is flawed
3. Stephan's criticisms are subjective
4. Redlich's political accusations are refuted by a closer friend of Hindemith's, Franz Reizenstein
5. Bobbitt's conclusions are unduly harsh

### 7.1 Norman Cazden (1954)

Discussions of the nature of consonance and dissonance were prevalent in the mid-twentieth century. Almost every author who published on Hindemith's theories had a background in this area – for example, Otto Ortmann, the translator of the *Craft II*, had published a relevant article in the *Bulletin of the American Musicological Society*, 'A Theory of Tone Quality' No. 2 (1937).<sup>234</sup> This fascination was part of the reaction towards atonality: a need to revisit the issue of consonance and dissonance in light of the varied and progressive compositional styles of the first half of the twentieth century. This is the background to Norman Cazden, whose *Unterweisung* critique 'Hindemith and Nature' (1954) is one of the most damaging accounts of Hindemith's theoretical writing. He writes:

By entering into problems of the theory of music, the composer Hindemith sets forth also certain attitudes towards the philosophy of his art. We are tempted in all charity to make a clear separation between Hindemith's various activities, on the reasonable ground that a good composer may be a poor theorist, while a brilliant theorist may show little talent as a composer. But Hindemith's just renown as a composer brings about a widespread influence and consideration of his views, and his words of wisdom or error alike are taken most seriously. Thus he bears a heavy responsibility for sound thinking, and if his statements and explanations are poorly founded, backed as they are by his personal prestige, he is in a position to cause much mischief to the understanding of music.<sup>235</sup>

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<sup>234</sup> This was followed by Ortmann, Otto, 'An Analysis of Paul Hindemith's "Unterweisung im Tonsatz"' *Bulletin of the American Musicological Society* Vol. 4 (Sept., 1940) pp. 26-8, a year after the publication of Ortmann's translation of *Unterweisung II* (1939).

<sup>235</sup> Cazden, Norman, 'Hindemith and Nature' *The Music Review* Vol. 15 (1954) pp. 288-306. This article was presented as a paper related to the American Musicological Society in Iowa City, 18 April 1953. The abridged abstract to this paper also appears in the *Journal of the American Musicological Society*, Vol. 7, No. 2 (Summer, 1954) pp. 161-164.

While many aspects of Cazden's accusations are incorrect, it has dealt a significant influence upon the reception of Hindemith theories in the English language.<sup>236</sup> The date of publication coincided with Hindemith's move from the US to Blonay, Switzerland: it is unclear whether Hindemith was ever aware of this article, or if he ever had the opportunity to defend his case, given that it appears shortly after the publication of his final major discussion of his musical philosophy in 1952 as *A Composer's World*.<sup>237</sup>

Cazden bases his argument on the revised edition of the *Unterweisung* (1940) and Mendel's *Craft* translation (1942), without commenting on the significant change in tone between the 1937 and 1940 editions. He quotes extensively from *A Composer's World* (1952), but without acknowledging that Hindemith's opinions may have changed since writing the *Unterweisung*. Central to Cazden's article is a summation of his own definitions of Hindemith's rules on interval and combination tones as eight points. This is then followed by four points noting contradictions within these definitions, and nine points that attack them more generally. There are a few issues that need to be addressed concerning Cazden's 'definitions'. To begin with, Cazden implies his eight rules as belonging to Hindemith when he states that 'Hindemith's rules for deriving interval roots from combination tones are as follows'. However, this is misleading as each 'rule' is significantly paraphrased by Cazden. Had he stated that 'these are Hindemith's main rules as I understand them' it would have been more appropriate. Of these rules, two are inaccurate. His definition of rule five is as follows:

- (5) Lower tones, presumably whether primary or combination tones, have greater weight ("klangliches Gewicht") than higher ones, due to the "weight of the vibrating material – the air masses" (*Craft*, p. 67).<sup>238</sup>

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<sup>236</sup> The reception of Hindemith's theories in the German language is the subject of a future study. It endured a problematic beginning, as the release of *Unterweisung I* in 1937 had to be kept quiet – Hindemith's work had been censored, and therefore it was not possible for the newspapers to review it. The publishers therefore took a risk in releasing the *Unterweisung* in Germany at all.

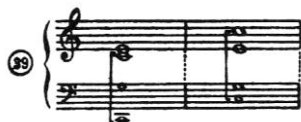
<sup>237</sup> There are further documents relating to Hindemith's aesthetics after 1952, although many of these remain unpublished such as his lectures for the University of Zürich. However, Hindemith devoted much more time to conducting and composing than to music theory from the mid-1950s until his death in 1963 after resigning from his teaching posts.

<sup>238</sup> Cazden, Norman, 'Hindemith and Nature' *The Music Review* Vol. 15 (1954) p. 294.

It is surprising that Cazden finds that this role may ‘presumably’ apply to primary or combination (difference) tones. Surely, if the matter is not clear then it should not be stated as a matter of fact as one in a list of Hindemith’s rules? Hindemith’s reference to *tiefen Töne* is made to differentiate between the two pitches in each interval of Series 2. This includes both the original notes and their associated difference tones as Cazden presumes. A further factor needs to be taken into consideration; in the case of a lower difference tone being of the second order, the higher difference tone is seen to have greater intensity (*Klangstärke*). Cazden fails to pick up on this, which leads to a misunderstanding in his sixth ‘rule’:

- (6) In case [combination tone 1] does not coincide with the lowest sounding tone, that is, when rules 4 and 5 conflict, the lowest sounding tone is still to be taken for the interval root. However, the conflict results in a “clouding” or “burdening” of the interval in question, which makes its rating inferior. Hence the m6 is inferior to the M3 (*Craft*, p. 67).<sup>239</sup>

Hindemith demonstrates the ‘strength’ of the major third over the minor sixth in example 7.1. This interval pair differs from the earlier fourths and fifths pair in that the lower difference tone is not of the first order for the inversion. Hindemith describes C as the root of the interval, given that E has no doubling in either the first or second order of difference tones. In this case, Hindemith states that the low C in the inversion ‘is only the weaker combination tone of the second order, and is surpassed in intensity by the combination tone of the first order, which lies above it’.<sup>240</sup> This statement directly conflicts with Cazden’s rule six, above. A further consequence of Hindemith’s distinction between difference tone intensity is that Cazden’s discussion of summation tones is largely irrelevant; they are acknowledged to be weaker than difference tones, and given that Hindemith only considers difference of tones of the first and second orders for reasons of intensity, there is no need for the weaker summation tones.<sup>241</sup>



Example 7.1: *Craft* (1942) p. 67.

<sup>239</sup> Ibid., p. 294.

<sup>240</sup> *Craft* (1942) p. 67.

<sup>241</sup> Cahan, David, ed., *Helmholtz and the Foundations of Nineteenth Century Science* (Berkeley: University of California Press, 1993).

Cazden's primary source on difference tones is Stevens and Davis, *Hearing* (1938).<sup>242</sup> While this may have been reliable at the time, Landau (1957) shows it to be inaccurate, by observing that the evidence provided on difference tones is not substantiated. He offers three points which provide a defence for Hindemith following Cazden's work based on Stevens and Davis:

1. The ear of a cat is not a human ear
2. Stevens and Davis studied only the interval formed by 700 and 1200 frequencies (a "large" major sixth)
3. Stevens and Davis' results may be accurate for *sensation* but other factors enter into the perception of combination tones. For instance, Jean holds that summation tones are much more difficult to perceive than difference tones "because they lie in a region of frequencies which is already occupied by the original sounds." For this reason Hindemith's exclusion of summation tones may be justified.<sup>243</sup>

These criticisms do not destroy the foundations of Cazden's work, although they mean that there are inaccuracies relating to the intensity of primary difference tones. While Cazden has criticised Hindemith for being in a position to cause much mischief, Cazden, too, has created barriers to Hindemith scholarship through his inaccurate rule paraphrasing and reliance on dated physiological texts.

His article, however, is not without insight. He identifies the incorrect use of the term 'overtone' in the place of 'harmonic partial'. While it is a small point, it means that when Hindemith refers to the problematic seventh overtone, he should have described it as the seventh harmonic partial or the *sixth* overtone. However, Hindemith's meaning is clear despite this small terminological error, particularly given his explanation of the term combined with a clear diagram. This is a very small point in the general scheme of things, and Cazden's strong criticism of this single term is unduly harsh.

There is a bias to be found in Cazden's writing that may be traced to his other published works. His writings include a dissertation entitled 'Consonance and Dissonance' (1948) and several articles on direction in harmonic motion, staff notation and musical ciphers, particularly within

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<sup>242</sup> Stevens, Stanley Smith, & Davis, Hallowell, *Hearing: its Psychology and Physiology* (New York: John Wiley & Sons, 1938).

<sup>243</sup> Landau, Victor, 'The Theories of Paul Hindemith in Relation to His Practice as a Composer' (New York University, PhD, 1957) p. 64.

an atonal context.<sup>244</sup> His Harvard doctoral dissertation, 'Consonance and Dissonance', of 978 pages in length, begins with a detailed examination of both overtones as the basis of musical phenomena – such as the 'Chord of Nature' – and combination tones. In the case of 'Consonance and Dissonance', he finds that the Pythagorean approach to musical consonance is one of description rather than prescription, which is the opposite method to Hindemith's Series 1.

When discussing combination tones in his thesis, Cazden makes the mistake of stating that Hindemith believed his work on combination tones to be an original discovery, presumably without knowing of Tartini and Helmholtz.<sup>245</sup> Regrettably, Cazden does not give a page reference from where in the *Craft* he has made this assumption, but it is a typical example of how Hindemith's lack of citation in his theory lends itself to misinterpretation. Hindemith was certainly aware of the work of Rameau, Tartini and Helmholtz before 1937, as shown in chapter two. Furthermore, much of his work on interval roots and inversions was original.

As is often the case in psychoacoustic studies, Cazden prefaces his discussion of difference tones with those of beats. These scientifically recognised acoustic phenomena – which are based on sound wave interference, particularly when two waves are approximately, but not exactly, the same frequency – is strongly disregarded for the purposes of music perception: 'For no directly musical purpose is the musician concerned with hearing [beats]. It is the piano tuner who is

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<sup>244</sup> Cazden, Norman, 'Consonance and Dissonance' (Harvard University, PhD, 1947). This PhD dissertation was submitted in April 1947 although Hilton & Meckna's *New Grove* entry states the date as 1948, perhaps when the dissertation was approved. From the acknowledgements it is likely that Walter Piston was his supervisor. A copy of this dissertation is to be found in the British Library, signed by the author on 13 January 1976. In Hilton & Meckna's *New Grove* entry on Cazden, the article on Hindemith in *The Music Review* is conspicuously absent, as are a number of other published writings. Further articles missing from this entry include:

'Realism in Abstract Music' *Music and Letters* Vol. 36, No. 1 (Jan., 1955) pp. 17-38.

'Tonal Function and Sonority in the Study of Harmony' *Journal of Research in Music Education*, Vol. 2, No. 1 (Spring, 1954) pp. 21-34

'The Principle of Direction in the Motion of Similar Harmonies' *Journal of Music Theory*, Vol. 2, No. 2 (Nov., 1958) pp. 162-192

'Musical Consonance and Dissonance: a cultural criterion' *The Journal of Aesthetics and Art Criticism*, Vol. 4, No. 1 (Sep., 1945) pp. 3-11

<sup>245</sup> *Ibid.*, p. 40. 'Hindemith follows the same principle [as Tartini], though describing it as an original discovery.'

interested in beats.<sup>246</sup> Using a detailed argument, which omits the potential advantages, Cazden neglects the theory of beats as a basis for consonance – in ways that will have undoubtedly biased his opinion of Hindemith’s work. This conclusion is reached on five main premises. Firstly, that Helmholtz’s application of Ohm’s law, while true when it corresponds to ‘demonstrable acoustic and physiological data’, is incorrect to the psychological level of musical perception.<sup>247</sup> For Cazden, there is an insurmountable barrier between observable data in a laboratory, such as vibration frequencies, and the musical pitch that one experiences as the listener.<sup>248</sup> Secondly, he notes that Helmholtz went to considerable trouble to demonstrate the existence of beats. This in itself indicates that they are not normally audible, and therefore not relevant to musical consonance, which he has placed in the field of musical perception. This is substantiated by a reference to Henry Watt (1919) who states that, despite the fact that overtones and difference tones have been proven to exist, one is not aware of them in the listening experience.<sup>249</sup> Thirdly, he notes that the effect of trills and tremolos would create unbearable beat fluctuations (which they clearly do not), and again reinforces his opinion with reference to Watt.<sup>250</sup> Fourthly, he cites Carl Seashore when he postulates that the human voice carries a vocal vibrato of around 6.5 cycles per second.<sup>251</sup> When compared with the beats of the fundamentals of E and F $\sharp$  on an equally tempered piano (41.203Hz and 46.249Hz respectively) which come to 5.046 cycles per second, Cazden observes that this would, by the beat theory of consonance, mean that this interval would be more pleasant or ‘consonant’ than the single, sung pitch.<sup>252</sup>

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<sup>246</sup> Ibid., p. 49.

<sup>247</sup> Ibid., p. 47.

<sup>248</sup> ‘No laboratory method of analysis of sensations can serve to reduce the perception of tones to a perception of their constituent “elements”.’ This postulate is followed by ‘the relations among tones of which music consists are precisely *not* given in sensation as such, despite the fact that musical relations are transmitted through a sensory medium.’ Ibid., p. 48.

<sup>249</sup> Watt, Henry J., *The Foundations of Music* (Cambridge: Cambridge University Press, 1919) p. 56.

<sup>250</sup> Ibid., p. 26. Referenced by Cazden (1947) p. 51.

<sup>251</sup> Carl E. Seashore, *Why We Love Music* (Philadelphia: Oliver Ditson, 1941) p. 47. Referenced by Cazden (1947) p. 51.

<sup>252</sup> Ibid., p. 51.

Finally, Cazden notes the potentially absurd philosophical conclusion of consonant beat theory: the perfect, smooth, consonant sound is silence.<sup>253</sup>

His article 'Hindemith and Nature', published six years later is an extension and application of ideas formulated in his doctoral work. While he mentions Hindemith's *Craft of Musical Composition* (but not the *Unterweisung*) in his dissertation, Cazden's polemic tone had yet to surface with specific regard to Hindemith. However, he belied a more general disliking for composer's theories: 'We believe the music of Bartók, of Copland, of Hindemith, of Ives, of Milhaud, of Prokofieff, of Schoenberg, needs no justification other than its musical value; if it did, no amount of theorizing, good or bad, would suffice to save it.'<sup>254</sup> As further evidence that Cazden had yet to find serious issue with Hindemith's theory, he uses the *Craft* to reinforce his connections between 'natural law' and musical consonance with the following quotation on the very first page of his dissertation:

Tonal relations are found in Nature, in the characteristics of sounding materials and of the ear, as well as in the pure relations of abstract numerical groups. We cannot escape the relationship of tones.<sup>255</sup>

Before undertaking his doctoral thesis, Cazden was a composer of stature enough to warrant a mention by Copland as a promising artist in his writings on American composers.<sup>256</sup> Copland refers to Cazden's *Sonatina*, written in 1935 for a volume of new composition in tribute to Hans Eisler's visit the United States. It demonstrates a preference for pitch-class collections typical of the Second Viennese School – an area of compositional technique that also influenced several of Hindemith's early compositions, such as his *Sonata for Solo Cello* op. 25/3. In the opening to Cazden's *Sonatina*, there is a collection of four pitches comprising pc-set 4-9 (example 7.2), formed by two tritones a semitone apart. These are developed to form the basis of the composition, which causes a strong tritone character to dominate, in addition to the intervals of

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<sup>253</sup> Cazden (1947) p. 51-2. This is a remarkably close precursor to John Cage's 4'33 (1952).

<sup>254</sup> Ibid., p. xiv.

<sup>255</sup> *Craft* (1942) p. 152. Referenced by Cazden (1947) p. 1.

<sup>256</sup> Copland, Aaron, *Copland on Music* (New York: Doubleday & Co., 1960) p. 161, with reference to Cazden's *Piano Sonatina* and *String Quartet*.

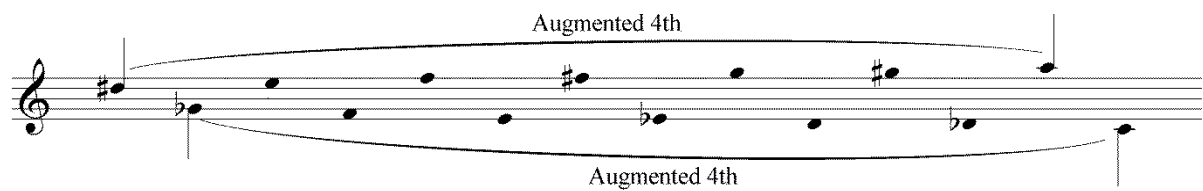
perfect fourths, fifths, semitones and major sevenths. For example, from bars 3-6 there is a descending pattern in the bass line (examples 7.3 and 7.4) which begins and ends with the interval of a major sixth. Cazden expands this interval by chromatic, contrary motion spanning the interval of an augmented fourth in each voice as illustrated in example 7.4. Both the augmented fourth and semitones are salient in Cazden's initial pitch collection.

By placing Cazden's polemic on Hindemith within the context of his own writings and compositions, it is possible to demonstrate that while Cazden was significantly opposed to Hindemith's writing on music theory, the pitch procedures in his music were not wholly dissimilar from some of those found in Hindemith's pre-*Unterweisung* music. Unfortunately for Hindemith, Cazden did not recognise these similarities in his article.<sup>257</sup>

Example 7.2: Cazden, *Sonatina* op. 7 (March, 1935) and corresponding pitch collection.

Example 7.3: Cazden, *Sonatina* bb. 3-6.

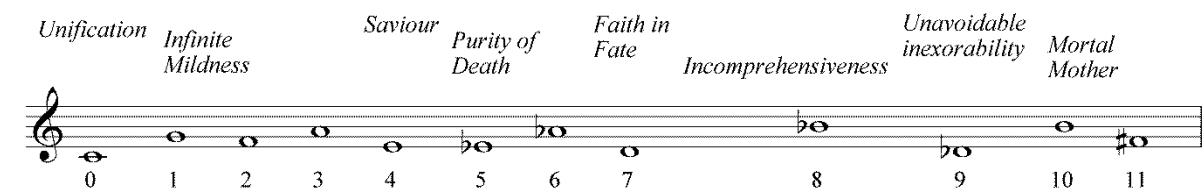
<sup>257</sup> The timing of Cazden's article may be related to his expulsion from the University of Illinois in 1953 (one year before his Hindemith critique was published) for suspected communist activities by the House Committee on Un-American Activities.



Example 7.4: Cazden, *Sonatina* bb. 3-6 left hand reduction.

## 7.2 Rudolf Stephan (1954)

In the same issue of *The Music Review* as Cazden's polemic (1954), the German musicologist Rudolf Stephan published a short, negative article on Hindemith's revisions to *Marienleben*. While Stephan was a very active writer on Hindemith, with a notable collection of texts in German publications, there are several misunderstandings.<sup>258</sup> He describes Series 1 as a *row*, which implies a serial system, where all pitch classes are equal.<sup>259</sup> While it contains all twelve pitches of the chromatic scale, Hindemith's Series 1 order is a hierarchy. In his revision notes to *Marienleben* (1948), Hindemith associates the following 'ideological category' with each key, which is based on the hierarchical values of Series 1:



Series I

Example 7.5: summary of Hindemith's key symbolism to *Marienleben II* (1948).

Stephan faults Hindemith's key symbolism: 'What hearer without absolute pitch and without having memorized a table of key interpretations is able, with the best will in the world, to feel according to this prescription?'<sup>260</sup> This ignores Hindemith's goal, which was to base a composition upon an ordered background structure. Whether this is immediately audible or not, it adds a cerebral plan to the layout of *Marienleben* that was absent in the first version. If the

<sup>258</sup> Stephan's published work focuses on music from the early twentieth century, written by composers such as Mahler, Berg and Schoenberg.

<sup>259</sup> Stephan's article was translated into English by Hans F. Redlich. It is therefore a possibility that the fault lays with the translator rather than the author. He describes it as 'a row, no. 1, arrived at in the *Unterweisung*.'

<sup>260</sup> Stephan, Rudolf, 'Hindemith's *Marienleben* (1922-1948): an assessment of its two versions' *The Music Review* Vol. 15 (1954) p. 279.

addition of key symbolism does not have a negative impact upon the compositional foreground, why should Stephan criticise it?

Stephan observes that Hindemith rejects bitonality in his revisions, a technique that received strong criticism in the *Unterweisung*. Of all the devices that he used before the 1930s, it is perhaps bitonality that Hindemith most readily dispensed with. Stephan demonstrates a bias towards Hindemith's 'old' bitonal techniques in his comparison of the following bars from *Marienleben* No. 4, 'Mariä Heimsuchung' (also found in chapter six, example 6.13):

The image displays two musical staves for piano, comparing two versions of the piece 'Mariä Heimsuchung' from 'Marienleben' No. 4. The top staff is labeled 'Ruhig Bewegt (♩ = 44-50)' and includes the dynamic marking 'p zart'. The bottom staff is labeled 'Ruhig Bewegt (♩ = biz 66)' and includes the dynamic marking 'p'. Both staves show a treble and bass clef with various musical notations including notes, rests, and slurs. The top staff features a more complex melodic line with many slurs and ties, while the bottom staff shows a simpler, more direct melodic line with fewer slurs and ties. The bass lines in both versions consist of chords and simple rhythmic patterns.

Example 7.6: Stephan's comparison of the two versions of *Marienleben* No. 4, 'Mariä Heimsuchung'.

These alterations demonstrate not only a rejection of bitonality, but a simplification of harmonic structure. Stephan faults the latter. The manner of his criticism, however, never progresses beyond the merely subjective; while Stephan may not have enjoyed these alterations, he does not adequately provide reasons for why his conclusion may apply to a more general listener. There is no objective reason why we should take Stephan's opinions over those of Harold Truscott who,

in his short review in *The Musical Times* (1969) takes a completely opposite view: that the second, revised version is far superior.<sup>261</sup>

### 7.3 Victor Landau (1960 & 1961)

Victor Landau published two articles in 1960 and 1961 entitled ‘Paul Hindemith, a Case Study in Theory and Practice’ and ‘Hindemith the System Builder: a Critique of his ‘Theory of Harmony’ respectively, six years after the forceful polemic of Cazden and the subjective criticism of Stephan in the 1954 issue of *The Music Review*. These articles originate from his PhD dissertation, ‘The Harmonic Theories of Paul Hindemith in Relation to His Practice as a Composer of Chamber Music’ (New York University, 1957).<sup>262</sup> The first is a condensation of his dissertation, while the second builds on it by attempting to analyse Hindemith’s theory of harmony. Landau writes that the publication of these articles in 1960/1, several years after Hindemith left the US, allows for a degree of objectivity that was not possible while Hindemith was at Yale.<sup>263</sup> The nexus of his first article is an exposition of his sample analysis of Hindemith’s works using the principles of the *Unterweisung* (1937 only; Landau does not provide any evidence that he is aware of the 1940 revision), a process that was preceded by Halliday’s dissertation (1941). A number of practical considerations were taken into account in this analysis: firstly, Landau only evaluates Hindemith’s chamber music for three to seven instruments, which he has divided into seven ‘periods’ of Hindemith’s composition: 1917-1921, 1922-1926, 1927-1931, 1932-1936, 1937-1941, 1942-1946 and 1947-1952. Secondly, and most significantly, he only ‘samples’ each piece, where he takes two movements from each complete work, and three samples from each movement. These samples are taken from the first movement and ‘the nearest subsequent movement in contrasting *tempo*’, then from each movement the samples consist of the opening phrase, the

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<sup>261</sup> Truscott, Harold, ‘Hindemith and “Das Marienleben”’ *The Musical Times* Vol. 110, No. 1522 (Dec., 1969) pp. 1240-1242.

<sup>262</sup> Apart from his doctoral dissertation and two articles in *The Music Review*, I have been able to locate no other information on Victor Landau.

<sup>263</sup> Landau, Victor, ‘Hindemith the System Builder: a Critique of his ‘Theory of Harmony’ *The Music Review* Vol. 22 (1961) p. 136.

phrase including the medial measure of bar line, and the ‘smallest natural division which contains the three final chords’.<sup>264</sup> Landau states that he has sampled eighteen works, which amounts to 774 measures of analysis.

In his doctoral thesis, Landau was able to demonstrate a greater transparency to his sample analysis than in his 1960 article, providing in full his understanding of Hindemith’s various compositional ‘rules’. The danger of reducing a composition to a succession of such rules, however, is that it can ignore artistic factors. Rules may be written to help students progress in a structured format, but to apply these rules in the other direction, back onto a composition, is to distort the reason for which they were invented: as an aid to technical ability, and as provocative starting points for classroom work.<sup>265</sup>

Landau bases his rule selection upon the 65 in *Craft II*, but reduces them to 22. These rules were originally written by Hindemith both as a means to analyse and refine his own work and for the practical purposes of teaching. In *Craft II*, much more so than *Craft I*, the emphasis was on practical pedagogy as demonstrated by the following passage, taken from the introduction:

He will notice that he retains complete freedom in the forming of an independent style of writing (which is definitely not the case with the older methods); that he is in no way forced to move in a predetermined stylistic direction – a concern of which I heard frequently after the publication of the theoretical part (Volume I) of this work; but that, instead, he receives an aid which he can apply to the solution of technical and stylistic problems of any kind whatever.<sup>266</sup>

There is a further problem with Landau’s investigation. While the analysis of every one of Hindemith’s musical works is impractical, it is problematic to arbitrarily exclude the majority of a sampled composition. For example, in Hindemith’s *String Trio No. 2* (1933) there are 1042 bars over the three movements: *Mäßig schnell – Lebhaft – Langsam*. Of this total, Landau’s analysis

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<sup>264</sup> Landau, Victor, ‘The Theories of Paul Hindemith in Relation to His Practice as a Composer’ (New York University, PhD, 1957) p. 45.

<sup>265</sup> *Craft II* (1939) p. viii, ‘The book [Craft II] counts on the explanatory activity of the teacher, who should adapt the material to the needs of the individual student. For the teacher the division into numbered rules and problems should in no sense be a hindrance in his work; instead he should find therein the challenge to create new work-material, as elaboration of that already presented.’

<sup>266</sup> *Craft II* (1939) p. viii.

would have evaluated 96 bars; 946 less than the total number and just under one-tenth of the piece.<sup>267</sup> Of the first movement, which consists of a fast 4/8 time signature, this represents a particularly small proportion. Conversely, for a movement with longer bars, often with a slower tempo, this would represent a disproportionately large percentage of the piece. While his sampling offers a consistent method, there is no way of knowing if the bars that he has missed out will provide conflicting data. Structurally, and thematically, one may consider these three sections to be representative of a complete movement. But not all of Hindemith's music unfolds in this way, and Landau's study is severely limited by not analysing complete compositions.

Landau's article omits a rule conflict, which is discussed in his thesis. The beginning of Hindemith's *String Trio No. 1* op. 34 (1924), falls into Landau's definition of Hindemith's second period. The first phrase consists of consecutive octaves, which would have been sampled by Landau as the first phrase for analysis. This phrase is repeated in a similar form at the end, which would be taken for Landau's third phrase of the movement. That two out of three of Landau's sample phrases are built around octave doubling would have seriously affected his results, and something that he does not account for in his 1960 article. However, in his thesis he explains that explains that unison passages of works such as the string trio were excluded, and that in such cases the succeeding or preceding material was selected.<sup>268</sup>

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<sup>267</sup> Landau, Victor, 'Paul Hindemith, a Case Study in Theory and Practice' *The Music Review* Vol. 21 (1960) p. 45 states that he sampled phrase lengths. It is therefore not possible to be entirely sure how long Landau understood each phrase to last for.

<sup>268</sup> Landau, Victor, 'The Theories of Paul Hindemith in Relation to His Practice as a Composer' (New York University, PhD, 1957) pp. 175-6.

Toccata. Schnelle Halbe  
Die Einleitung ein wenig breiter

Violin

Viola

Violoncello

Vln.

Vla.

Vc.

Zurückhalten

ten.

ff

Example 7.7: Hindemith, *String Trio No. 1* op. 34 (1922).

Once each sample is extracted, Landau subjects it to a harmonic analysis, which he bases on Hindemith's own methods. His objective is to investigate the quantitative representation of Hindemith's theory in his own compositional practice, which assumes that Hindemith's own analytical methods were both prescriptive as well as descriptive. Therefore, Landau believes that Hindemith's chord fluctuation, which was used analytically in the *Unterweisung*, must prescribe the procedures of Hindemith's theory-based compositions, in addition to other categories such as two-voice framework, degree-progression and tonality.<sup>269</sup>

Landau concludes that 'from the evidence that has been presented ... the relationship of Hindemith's harmonic theories to his practice as a composer of chamber music is something less than may be expected considering that the theorist and composer are the same person and that

<sup>269</sup> Landau, Victor, 'Paul Hindemith, a Case Study in Theory and Practice' *The Music Review* Vol. 21 (1960) p. 45.

the theories are intended to apply to all music including his own.<sup>270</sup> The validity of this conclusion is based on a flawed sampling method.

#### 7.4 Hans F. Redlich (1964)

Hans F. Redlich's article, 'Paul Hindemith: a Re-assessment' (1964) appears next in *The Music Review*. The author takes pleasure in stating that he 'repeatedly met' Hindemith between 1922 and 1930, which should have afforded him a close understanding of Hindemith's work. However, his article is flawed for two reasons. Firstly, he misunderstands Hindemith's concept of pitch centre, and secondly he (damagingly) implies that Hindemith was a Nazi sympathiser, without necessary evidence.

His analysis of the opening of the *String Trio No. 1* op. 34 (also discussed in relation to Landau's article) describes harmonic movement as a diatonic progression, including C minor, A $\flat$  minor, G $\flat$  major, C $\flat$  major and then back to D. Given that the texture of this passage is unison throughout, these are key 'implications' that are associated with compound melody. This understanding, which is essential to unaccompanied Baroque pieces such as a J. S. Bach violin partita, fits less comfortably with Hindemith's hierarchy-based chromatic system.

By contrast, Neumeyer (1976) reads each pitch in relation to the pitch centre of the passage (D), which is more faithful to *Unterweisung* theory.<sup>271</sup> He finds that a compound melody view of this passage steeped in diatonic progressions assumes too much. If we transpose Series 1 to this centre, these keys represent an initial, and strong, move away from the centre (C and A $\flat$ , which are pitches 8 and 11 where D = 0) before returning to closer pitches (G $\flat$  and C $\flat$ , which are pitches 4 and 3). The piece begins on the pitch of D but *not* in the key of D. The appearance of a

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<sup>270</sup> Landau, Victor, 'The Theories of Paul Hindemith in Relation to His Practice as a Composer' (New York University, PhD, 1957) p. x.

<sup>271</sup> Neumeyer, David, 'Counterpoint and Pitch Structure in the Early Music of Hindemith' (Yale University, PhD, 1976) pp. 8-9.

major triad at the end of this movement following a reprise of this opening phrase needs to be considered as an example of a ‘strong’ or ‘significant’ triad which can effectively end the piece rather than the resolution of a key or tension between diatonic materials.

In the conclusion to Redlich’s article, he condemns both the *Unterweisung* and post-1933 compositions for being compositionally sterile, likening them to Mendelssohn’s oratorios. However, similar to Stephan’s article on the revision to *Marienleben*, his comments never rise above the subjective. And yet his concluding words, published the year following Hindemith’s death, are unreservedly derogatory:

This music was stillborn in 1933, the year it was written. It is possible that its sterility somehow reflects the traumatic shock experienced by its creator at the advent of Hitler’s Third Reich ... Posterity had spoken its verdict long before Hindemith died. His fate was truly tragic: he lived on to watch how his own concept of musical thought lost its meaning for a younger generation. Safe middle courses in art are always doomed to failure ... Perhaps the initial stirrings of Paul Hindemith, the musical enfant terrible of 1921, will score some kind of precarious immortality when *Unterweisung im Tonsatz* and all its practical demonstrations have sunk into limbo.<sup>272</sup>

The most condemning aspect of Redlich’s article is his general tone, which implies that Hindemith was a Nazi sympathiser. However, these implications are not substantiated by necessary reference to recollections and documentary evidence. This complex issue was addressed by the composer Franz Reizenstein, and his reaction is discussed in the following chapter on Hindemith’s legacy.

## **7.5 Richard Bobbitt (1965)**

Published a year after Redlich’s article, Richard Bobbitt launched a detailed examination of Series 1 in ‘Hindemith’s Twelve-tone Scale’ (1965).<sup>273</sup> The destructive use of language parallels Cazden when he expresses how the ‘numerous errors and contradictions’ of Hindemith’s theory were ‘exposed’. However, positively, this article notes the uncanny similarities between Series 1 and a

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<sup>272</sup> Redlich, Hans F., ‘Paul Hindemith: a Reassessment’ *The Music Review* Vol. 25 (1964) p. 253.

<sup>273</sup> Bobbitt chooses to focus exclusively on Series 1 and harmonic partials. He does not bring Series 2 and combination tones into his discussion.

scale formulated by Alexander Malcolm in 1721.<sup>274</sup> To achieve this, Bobbitt calculates the ratios between each note of Series 1 using cents to demonstrate the following:<sup>275</sup>

### Hindemith's Series 1

C	D $\flat$	D	E $\flat$	E	F	F $\sharp$	G	A $\flat$	A	B $\flat$	B	C
64	68.26	72	76.8	80	85.33	90	96	102.4	106.66	113.77	120	128
Difference in cents:												
	112	92	112	70 $\sharp$	112	92	112	112	70	112	92	112

Table 7.1: adapted from Bobbitt (1965) p. 111.

$\sharp$  These two figures have been incorrectly rounded down to 70: in three decimal places, the logarithms are actually 70.672. However, this does not affect the relationship to Malcolm's scale.

### Malcolm's Scale

C	D $\flat$	D	E $\flat$	E	F	F $\sharp$	G	A $\flat$	A	B $\flat$	B	C
64	68.26	72	76.8	80	85.33	90	96	102.4	106.66	113.77	120	128
Difference in ratios:												
	15/16	128/135	15/16	24/25	15/16	128/135	15/16	15/16	24/25	15/16	128/135	15/16
Difference in cents:												
	112	92	112	70	112	92	112	112	70	112	92	112

Table 7.2: adapted from Bobbitt (1965) pp. 112-116.

Malcolm formulated frequencies as a solution for the tempered, chromatic scale. Taking the exact ratios, and applying them based on the initial C as equal to 64Hz, Bobbitt is correct in his comparison to Hindemith's Series 1. However, Bobbitt does not give adequate attention to the fact that they arrived at their ratios via completely different methods. Malcolm, in an explanation that does not provide any specific frequencies (his discussion purely involves the use of fractions to represent the ratios between pitches), belies an agenda for a chromatic tuning that benefits a diatonic framework. This includes an acceptable intonation of the augmented fourth from F to B (in C major).<sup>276</sup> That this temperament was first used as a chromatic scale, and yet was intended

<sup>274</sup> Malcolm, Alexander *A Treatise of Musick: speculative, practical and historical* (1721), subsequently published abridged in 1779.

<sup>275</sup> Bobbitt criticises Hindemith for not using cents in the *Unterweisung* to demonstrate the distances between intervals. Whether Hindemith was aware of this process at the time or not, we can be certain that by the time of *A Composer's World* (1952, p. 81) he knew of Ellis' division of the octave into 1200 cents. The Blonay Bibliothek shows that Hindemith only owned the 1877 German edition of Helmholtz's *Tonempfindungen*.

<sup>276</sup> Malcolm, Alexander *A Treatise of Musick: speculative, practical and historical* (1721) p. 194, 'Again there must be some reason for placing these semitones in one order rather than another, i.e. placing 15 : 16 uppermost in the tone f : g, and undermost in all the rest; which reason is this, that hereby there are fewer errors or defects in the scale; particularly, the 15 : 16 is set in the upper place of the tone f : g, because by this the greatest error in the diatonic

to be used within a diatonic framework, makes it all the more surprising that it is identical to the propositions in Series 1. Malcolm's work is discussed in Rousseau's *Dictionnaire de Musique* (1768), where it is cited in a discussion of a chromatic scale, in which any note may become a new fundamental or tonic. This conflicts with Series 1, and yet, coincidentally, they have exactly the same ratios.

Bobbitt states that Malcolm's temperament had been discussed in the twentieth century, by James Murray Barbour (1951).<sup>277</sup> This text may link to Hindemith; in his preface, Barbour writes that 'My interest in temperament dates from the time in Berlin when Professor Curt Sachs showed me his copy of Mersenne's *Harmonie universelle*.' Sachs was a colleague of Erich Moritz von Hornbostel in Berlin, and director of the Staatliche Instrumentensammlung from 1920 – which was attached to the Berlin Hochschule für Musik.<sup>278</sup> This is further evidence of the investigations into tuning and temperament in the 1920s and early 1930s Berlin. Barbour's text was also based on his unpublished doctoral dissertation, 'Equal Temperament: Its History from Ramis (1482) to Rameau (1737)' awarded by Cornell in 1932. His supervisor was Otto Kinkeldey: both the founder of American musicology, and doctorate holder from Berlin (1909).<sup>279</sup>

Barbour's text states that Malcolm's scale is the same as Kepler's second monochord, transposed down a fifth.<sup>280</sup> He also shows that Malcolm's scale is identical to those by Sylvestro Ganassi (1543) and Andreas Reinhard (1604), except with the semitones arranged in a different order.<sup>281</sup>

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scale is perfectly corrected, viz. the false 4th betwixt f and b upward, which exceeds the true harmonic al 4th by the semitone 128 : 135, and this semitone placed betwixt f and f#, makes from f# to b a true 4th; and corrects also an equal defect in the interval b-f taken upward, which instead of a true 5th want 128 : 135, and is now just, by taking f# for f, that is, from Bb up to f# is a just fifth.'

<sup>277</sup> Barbour, James Murray, *Tuning and Temperament: a historical survey* (East Lansing: Michigan State College, 1951).

<sup>278</sup> Brown, Howard Mayer, 'Curt Sachs' *New Grove Online*, accessed 9 August 2010.

<sup>279</sup> Otto Kinkeldey studied in Berlin from 1902-9 at the Königlichches Akademisches Institut für Kirchenmusik.

<sup>280</sup> Barbour (1951) p. 100. Kepler, *Harmonices Mundi* (1619) p. 163.

<sup>281</sup> Ganassi, Sylvestro, *Regola Rubertina* (Lettione seconda, 1543); ed. Max Schneider (Leipzig, 1924), Chapter IV. Andreas Reinhard, *Monochordum* (Leipzig, 1604)

It is a missed opportunity that Bobbitt did not feel it necessary to mention these other predecessors of Hindemith's Series 1. This may be contextualised by the presence of an edition of Kepler's *Welt-Harmonik* (1939) in Hindemith's Blonay library, and by his succeeding opera on his life, *Die Harmonie der Welt* (1957).<sup>282</sup> In this opera, therefore, the relationships of Series 1 take on an even greater significance: Series 1 is based upon Kepler's own monochord. Because of the contextual richness of this relationship, a subsequent analysis of Hindemith's *Die Harmonie der Welt* can completely transform the way in which we perceive his compositional process. Not only is this a work on Kepler's life, but a composition based on his own scale, paraphrased within Hindemith's Series 1.

Bobbitt's illustration of the proportional difference between each pitch facilitates comparison with other scales. In addition to showing that the pitches bear an identical relationship to Malcolm's, Bobbitt shows a relationship to Claudius Ptolemy. His observation here – and one that may indeed be seen to point out a contradiction within Hindemith's writings – is that while Hindemith rejected the formation of pitches based on the ratios of fifths and thirds, as found in Ptolemy, his ratios arrive at the same results.

The Yale Hindemith Collection holds two unpublished fragments, handwritten by Howard Boatwright, which mention the relationship between the scales of Hindemith and Malcolm. These fragments, which are not dated (they were perhaps drafted in partial response to Bobbitt's findings) contain a brief defence of Hindemith. Boatwright states that, while the tuning is identical to Malcolm, the *procedure* itself is new. Bobbitt's article placed the advocates of Hindemith's theory in a position which they felt the need to defend, although unfortunately for Hindemith, Boatwright's articles were not published.

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<sup>282</sup> Kepler, Johannes, *Welt-Harmonik* (Munich & Berlin, 1939) was published after Hindemith had written *Unterweisung I* (1937). However, it is likely that Hindemith knew of Kepler's theories before this.

Bobbitt asserts that Hindemith's calculation for the frequency of B $\flat$  at 113.78Hz is an error; however, this is simply down to Hindemith not demonstrating the recurring decimal rather than an incorrect calculation. This point was cited in the first issue of the *Hindemith Jahrbuch*, where Erich Altwein published a short appendix article in Hindemith's defence.<sup>283</sup> Similar to Cazden's criticism of Hindemith's mislabelling of the term 'overtone' for 'harmonic partial', Bobbitt writes with a polemical tone that is unduly harsh for matters of small detail.

Bobbitt also faults Hindemith's temperament. In the *Craft*, Hindemith states that singers and instrumentalists have a subconscious feeling for intervals.<sup>284</sup> He also states that there is a musical element lacking in the equal tempered space of a chromatic keyboard instrument. However, this subconscious inclination for singers and instrumentalists to temper certain intervals is not necessarily related to Hindemith's temperament. This highlights a common misunderstanding that Hindemith's frequencies are to be followed *precisely*. They are not: they are in place to firstly demonstrate that Hindemith has arrived at new pitches scientifically and secondly that each frequency is *close enough* to represent a pitch in his hierarchy. To criticise Hindemith's pitches for their temperament is to miss the point, and intention, of providing discrete frequencies to each pitch.<sup>285</sup>

Bobbitt was associated with the Berklee School of Music as Dean between the 1960s and 1970s, and it was during that time he published his article on Hindemith. It is noteworthy that he also published 'Harmonic technique in the rock idiom: the theory & practice of rock harmony' (1976), which came shortly after the recognition of guitar as a principal study instrument, alongside the growth of rock music, in the Berklee School of Music in the 1960s. Bobbitt was known therefore as a popular music specialist in jazz and pop theory. Similar to Cazden, Bobbitt

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<sup>283</sup> Altwein, Erich F. W., 'Hindemith's calculation is not in error here...' *Hjb* Vol. 1 (1971) pp. 195-6.

<sup>284</sup> *Craft* (1942) p. 43.

<sup>285</sup> It should be noted, however, that Hindemith is not always clear on this matter. See chapter two for a discussion of Series 1 temperament.

had strong interests in the sorts of problems that Hindemith tried to address in the *Unterweisung* in advance of publishing an article in *The Music Review*, including an article in the 1959 *Journal of Music Theory* entitled, ‘The Physical Basis of Intervallic Quality and its Application to the Problem of Dissonance’.<sup>286</sup> Bobbitt cites Cazden’s article on Hindemith, showing that he already shared his polemical tone. In an interview with the composition professor, John Bavicchi, in the Berklee Oral History Project, ‘Dick’ Bobbitt was also very against the teaching methods of Walter Piston, showing that he was against both speculative and practical music theory.<sup>287</sup> His damaging polemic on Hindemith is symptomatic of a general distain towards formalistic teaching pedagogy, and lies on the peripheries of his academic output.<sup>288</sup>

## 7.6 Clifford Taylor (1983)

The final article on Hindemith’s theory to appear in *The Music Review*, by Clifford Taylor (1983), was unusually positive. It followed the change of editorship of *The Music Review* in 1974 from Geoffery Sharp to A. F. Leighton Thomas. Taylor offers a brief overview of the previous articles mentioned in this chapter and counters the negative slant on Bobbitt’s observation that Alexander Malcolm had ‘done it before’ by considering this as a strength rather than a weakness. For if an historical precedent exists – and one of which Hindemith was likely not aware – it can

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<sup>286</sup> Bobbitt, Richard, ‘The Physical Basis of Intervallic Quality and its Application to the Problem of Dissonance’ *Journal of Music Theory* Vol. 3 No. 2 (November, 1959) pp. 173-207. While there is no reference to Bobbitt in the New Grove, it is fortunate that the *Journal of Music Theory* gives the details of the authors, stating that Bobbitt is a composer and member of the faculty at the Boston Conservatory of Music. However, his name does not appear on the staff alumni lists in the conservatory library – although he was Dean at Berklee later in his career. So far, it has unfortunately been impossible to find any evidence of his compositions, but I hope to track them down to add to this discussion.

<sup>287</sup> Berklee Oral History Project, interview with John Bavicchi, available online at <http://library.berklee.edu/archives>. He speaks that ‘Dick Bobbitt ... would argue with me about how bad Piston was; how narrow-minded ... he didn’t like Piston’s [teaching] approach.’

<sup>288</sup> Demonstrating the anti-formalistic teaching approach in Berklee, and in almost complete opposition to Hindemith’s approach, John Bavicchi writes in his biography that ‘In my classes, I make the students do the work themselves, which reflects my basic philosophy. I refuse to stand at a blackboard writing down everything that students have to know while they fall asleep. Teaching, for me, is getting students involved in working on projects through which they learn the solution to a particular musical problem. I think of myself as the ‘dummy’ in a bridge game who knows everything that’s going on but shouldn’t talk. In my case, I do talk to make sure that everyone understands everything that’s going on in the musical sense. The way I feel about teaching composition is that my pupils shouldn’t sound like me.’ Taken from <http://www.berklee.edu/faculty/detail/john-bavicchi>, 25 April 2011.

actually be viewed positively by showing that it was a viable solution to chromatic interval relationships to more than one theorist: it validates rather than dismisses the theory.

A diatonic system is built upon a hierarchy, which is formed from the chain of fifths. For example, the supertonic is considered further from the dominant in relation to the tonic as made evident in the classical cadence (the system of secondary dominants). Taylor links this system and Hindemith's attempts at a fully chromatic hierarchy. He believes that Hindemith was 'trying to secure the Western tonal system by providing the necessary means of extension for it to be able to sustain the theoretical needs of twentieth-century emotionally expressive values'.<sup>289</sup> This posits that Hindemith's Series 1 is, in a sense, tonal. The difference between the traditional diatonic system and Series 1 is that while the former is based on the 'seven diatonic plus five accessory leading notes', Hindemith's work encompasses twelve.<sup>290</sup> This was to make all the notes 'autonomous and equally functional, yet with defined and extended relationships to a tonic'. In other words, Taylor's notion that Hindemith's Series 1 is tonal is built on the premise that the initial, progenitor tone is a *tonic*. However, this is not to be understood as contributing towards a tonic triad, which would contradict my earlier criticisms of the analyses of Redlich (1964).

Taylor's article, while not providing a sense of closure on the polemic writings in *The Music Review*, at least attempted to place a degree of historicity upon these writings. He also made brief comparisons to more recent theories of music, including Fred Lerdahl and Ray Jackendoff's *Generative Theory of Tonal Music* which was published in the same year.<sup>291</sup> However, the consolidation of the available literature was ultimately ineffective at spawning a renewed enquiry into Hindemith's theoretical writings. The work of Cazden, Stephan, Landau and Bobbitt

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<sup>289</sup> Taylor, Clifford, 'The Hindemith Theories: a Reevaluation of Premise and Purpose' *The Music Review* Vol. 44 (1983) p. 249.

<sup>290</sup> *Ibid.*, p. 249.

<sup>291</sup> Lerdahl, Fred & Jackendoff, Ray, *A Generative Theory of Tonal Music* (Cambridge: MIT Press, 1983).

(combined with the lack of material in other English language journals) had become too sizeable to negate in a short article.

## 7.7 Conclusions

Despite the damage to Hindemith's music theory caused by these articles – which could not be undone by Taylor's final article – no author was in a high standing within the musicological community.<sup>292</sup> Many of the major academic figures of the mid to late twentieth century chose to ignore Hindemith's theories. Even in the *Journal of Music Theory*, which was strongly connected to Hindemith via his Yale students, and which was willing at all times to continue an undertone of positivism towards Hindemith, did not publish a significant article on his theory from Charles Shackford (1972) until Allen Forte (1998).

There were, however, a number of doctoral dissertations that sprang up in the immediate aftermath of *Unterweisung I*. Many were never published. These include the majority of Victor Landau's work (with the exception of his two articles in *The Music Review*), and dissertations by John R. Halliday and William Thomson.<sup>293</sup> These theses, which have been forgotten in the majority of Hindemith literature, are founded upon an attempt to investigate and apply Hindemith's theories.<sup>294</sup> Had Hindemith remained in the US to further his theoretical work, the direction of contemporary discourse would have continued in this direction, by applying his theories to his own compositions, and potentially to the work of other composers. Moreover, Halliday's thesis is a rich source for the immediate reception of Hindemith's *Unterweisung I*, given its proximity to the release of the German editions (1937 and 1940). It is also noteworthy as it

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<sup>292</sup> The slight exception to this would be Rudolf Stephan, although he is not an Anglo-American author, despite his text appearing in English.

<sup>293</sup> Halliday, John, 'Paul Hindemith – the Theorist' (University of Rochester, Eastman School of Music, PhD, 1941), which was made available by the Eastman School of Music Library, and Thomson, William, 'A Clarification of the Tonality Concept' (University of Indiana, PhD, 1952).

<sup>294</sup> It is particularly surprising not to find these theses in the cornerstones of the critical Hindemith literature, namely Neumeyer (1986). Luttmann, Stephen, *Paul Hindemith: A Guide to Research* (Routledge: London, 2005) does reference Halliday, but without any commentary. He fails to include Thomson.

partially translates *Unterweisung I* in advance of Mendel's translation – something which has been missed in Hindemith scholarship. Halliday translates parts of the 1937, rather than 1940, edition of *Unterweisung I*, which allows for a comparison of his translation and Mendel's in *Craft I* (1942). Thomson's thesis, 'A Clarification of the Tonality Concept' has been missed most likely due to the title not alluding to a major study of Hindemith. This thesis, however, is a very considerable study of the theory of Hindemith, which allocates it equal critical footing with the theory of Schenker: it is significant because it shows that, in 1952, it was not out of place to discuss these two theories side-by-side in an English-language study.

## Chapter 8: The Hindemith Legacy

all the young composers are writing like Hindemith  
(Copland, 1947)<sup>295</sup>

The present generation judges him harshly – is, in fact, downright unfriendly. Hindemith is no longer cited among the top men of our time; it is undeniable that a severe downgrading is in process.  
(Copland, 1967)<sup>296</sup>

Many twentieth-century composers and theorists were reliant on their students to introduce and champion their work to a wider community. Following his death in 1935, Schenker is a notable example, whose theoretical work was disseminated and built upon by faithful students such as Ernst Oster, Felix Salzer and Oswald Jonas.<sup>297</sup> Their enthusiasm and dedication precipitated the international understanding of his work in the second half of the twentieth century. Hindemith was not as fortunate as Schenker. Despite attracting a large following during the 1940s, particularly in the United States, a dramatic devaluation of Hindemith's music and theory occurred during the 1950s, provoking Copland to reverse his implicit criticism of Hindemith's music influence in the 1940s to a defence of his worth.<sup>298</sup> This chapter explores this shift in attitude and its consequences for the wider reception of Hindemith's music and theory.

It begins by showing the strict influence of Hindemith as a teacher. He taught widely throughout his career, including three appointments at Berlin (1927-1937), Yale (1940-1953) and Zurich (1951-54), and shorter spells at Tanglewood (1940), Buffalo (1940) and Ankara (1935-7). This provided him with many opportunities to nurture relationships with faithful students, who could then go on to disseminate and build upon his work. For example, the impact of his *Unterweisung* principles may be found in the music of his Berlin students, particularly Franz Reizenstein and

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<sup>295</sup> This quotation is taken from an unpublished letter by Howard Boatwright in 1959, where he remembers hearing Copland make this remark 'without much pleasure'. The remark is also printed in The Editor's Window, *Yale Alumni Magazine* (December, 1964) p. 19.

<sup>296</sup> Kostelanetz, Richard ed., *Aaron Copland: a reader: selected writings 1923-1972* (New York: Routledge, 2003) p. 58.

<sup>297</sup> Ernst Oster translated Schenker's *Der freie Satz* (New York: Longman Inc., 1979), Felix Salzer wrote the seminal exposition of Schenkerian theory in the English language as *Structural Hearing* (New York: C. Boni, 1952) and Oswald Jonas founded the Schenker Institut (1935).

<sup>298</sup> Grout, Donald Jay & Palisca, Claude V., *A History of Western Music* (New York: W. W. Norton & Co., 2001) p. 767: 'The presence of Paul Hindemith at Yale between 1940 and 1953 turned its school of music for a time, even after he left for Zurich, into a nest of his disciples.' This source is particularly informative, as Palisca was a long-standing member of the Yale faculty (1959-92).

Harald Genzmer, the theorist Alfred Rubeli (Zurich), and across the Atlantic in the music of Carl Miller and music theory of Vincent Persichetti and Howard Boatwright. Moreover, a prominent figure in Danish musical life, Neils Viggo Benzton, wrote music that bears strong resemblances to Hindemith's style, in addition to a hagiographic monograph (1997) on Hindemith's life and works. These were highly respected musicians during their lifetimes, although none were to leave an enduring musical legacy, compared with the internationally prominent Elliott Carter and Leonard Bernstein, who studied under Walter Piston at Harvard during a similar period. This is reflected in Taruskin's *The Oxford History of Western Music*, where not one of Hindemith's most competent students or imitators is mentioned. Carter, by contrast, has a full chapter to himself in the final volume 'Music in the Late Twentieth Century', a feat not achieved by Paganini, Liszt, Berlioz or Schumann in the third volume 'Music in the Nineteenth Century'.<sup>299</sup> The difference between the influences of Hindemith's students versus Piston's is therefore striking, and might well account for why Hindemith's musical and theoretical legacy waned in the second half of the twentieth century.<sup>300</sup>

This chapter also examines the circumstances of Hindemith's compositional and theoretical legacy, showing how Hindemith was the victim of a cross-road in music theory and compositional aesthetics from the 1950s, which resulted in a sudden downgrading of his music and music theory. This junction included the developments in musical set theory by Milton Babbitt, the dissemination of Schenkerian theory in the English language, a succession of damning articles in *The Music Review*, and the growing popularity of Piston's practical manuals on harmony, counterpoint and orchestration. Had these events not unfolded almost precisely when

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<sup>299</sup> These nineteenth century composers had to share their chapters: Liszt with Paganini and Berlioz with Schumann.

<sup>300</sup> Forte, Allen, 'Paul Hindemith's Contribution to Music Theory in the United States' *Journal of Music Theory* Vol. 42, No. 1 (Spring, 1995) p. 7, also picks up on this point, concerning Hindemith's music theory students: 'these modest numbers, [of theorists and composers who studied under Hindemith] which do not translate into a significant number of academic or other positions of influence, reinforce my hypothesis that in the United States Hindemith's influence and reputation as a music theorist must have derived mainly from dissemination of *The Craft of Musical Composition*'.

Hindemith left Yale to live in Switzerland, it is possible that his music and music theory would have been afforded more scholarly attention today.

The unclear status of the *Unterweisung* is partly to blame for its lack of attention. It is not an explicit exposition of his own musical language (such as Messiaen's *Technique de mon langage musical* or Carter's *Harmony Book*), despite containing many close connections to his work, nor is it a wholly practical text based on the objective analysis of past music (such as Piston's *Harmony* or Schoenberg's *Fundamentals of Musical Composition*). The *Unterweisung* falls into a problematic grey area between the personal and the observational. If Hindemith had claimed explicitly that it was intended as an overview of the techniques of his musical language, then it may have attained greater popularity. With the exception of the analyses at the end of the first volume, all musical examples in *Unterweisung I* and *II*, and *Traditional Harmony I* and *II*, were composed by Hindemith.<sup>301</sup> But this is not acknowledged. By contrast, textbooks with a clearer status, such as Piston's *Harmony* and Schoenberg's *Fundamentals*, are to be found in university department course syllabuses throughout the world, and they hold an enduring practical value to a diverse range of musical professions.

Here is an example where Hindemith composes new tasks, rather than takes them from existing compositions. It is chosen from *Traditional Harmony II*, and comprises the theme from a set of variations for string trio (violin, viola and 'cello), where the student is asked to fill in the two remaining instruments. The melody line is stamped with the quartal *Unterweisung* character, and lends itself well to a quartal harmonisation. It cannot be understood as a purely practical exercise, as the student must first negotiate Hindemith's style.

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<sup>301</sup> See also chapter three 'Method', example 3.5.

Example 8.1: *Traditional Harmony II* (1953), p. 18, 'Theme and Variations for String Trio'.

Bars 2 and 14 are implicitly quartal, although the possibility for a diatonic harmonisation is left open: bar 2 could be interpreted as a succession of dissonances around an F minor triad; bar 14 around an A $\flat$  minor triad. While these harmonic possibilities are available, Hindemith implicitly steers the student in his own harmonic direction by placing quartal voice leading in the theme. Moreover, in a previous example for four-part chorus, Hindemith states that the student must take care to avoid modulation, another characteristic of quartal pitch collections.<sup>302</sup>

## 8.1 Hindemith the Strict Pedagogue

Hindemith was an exceedingly demanding teacher. Evidence of this may be found in student reminiscences, in Hindemith's letters regarding Tanglewood Summer School and in his class reports from Yale. Describing his experiences as a guest composition teacher (alongside Copland) at the 1940 Tanglewood Summer School, Hindemith believed that his strict counterpoint and orchestration methods were 'absolutely necessary if one wants to get rid of all that more than monstrous sloppiness and ignorance prevailing in this country in matters of composition and music theory'.<sup>303</sup> Three of his textbooks from his time in the US, *Traditional*

<sup>302</sup> *Traditional Harmony II* (1953) pp. 16-17: 'In these pieces, as well as in the later ones of this chapter and in those of Chapters IV and V, great care must be taken not to modulate. Only by avoiding modulation can the tonal style aimed at in these exercises be achieved.'

<sup>303</sup> Skelton, Geoffrey, *Selected Letters of Paul Hindemith* (New Haven: Yale University Press, 1995) p. 167. Lukas Foss and Leonard Bernstein studied on this Tanglewood course.

*Harmony I & II* (1943 & 1948/53) and *Elementary Training* (1946), were inspired by this desire to increase the basic technical standard of music students.

Perhaps the most severe examples of Hindemith's demanding pedagogical attitude are found in his entrance exams to his Yale class. Example 8.2 is a transcription of one such entrance exam, which consists of two parts: a performance, combining vocal and keyboard skills, followed by a dictation. The demands of this test were exceptionally high. Hindemith expected a fluent understanding of six different clefs, alternating in quick succession. He required the student to play (presumably the piano) and sing simultaneously, in an unconventional clef. This is followed by a transposition exercise, not only requiring that the student change the key of transposition quickly, but then combining this with different clefs. There are also a variety of different traps for the student, to make the test even harder: in the second exercise, where the student must sing a melody in bass clef, there is an E# followed by an F# in bar 2; a Cb followed by a B# in bar 3; and an E# followed by an Fb in bar 5. In each case, the product is simply a repeated note. This is not something that a musician would have to deal with in a professionally-produced score, and would likely have come as a surprise to even the most able students.

1) Play upper part, sing lower part

2) Sing

3) Play  
in A in F in D

5 in Bb

9 in Eb (in C)

## Dictation

4a)

4b)

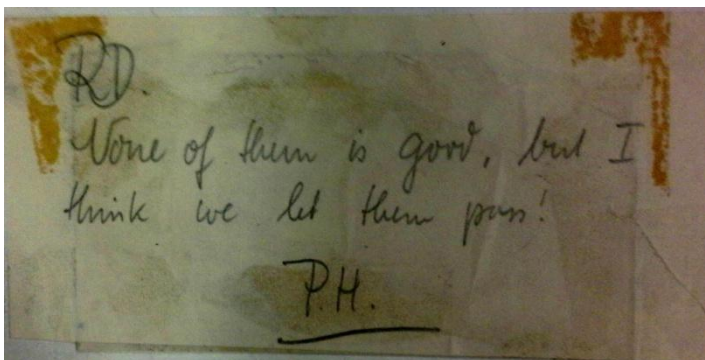
4c)

Example 8.2: an entrance exam to Hindemith's Yale class.

Hindemith's reports on the students who sat this paper were not favourable, and were severely lacking in compromise. Of one candidate he wrote, 'Very poor. Playing bad, reading very bad. Reaction very slow. Seems rather hopeless.' In contradiction to this damning verdict, Hindemith wrote a brief note (example 8.3) to Richard Donovan stating that, despite all twelve candidate auditioning that year being poor, they should be allowed to pass!<sup>304</sup> This is all the more remarkable, as one of the students in this group was Mel Powell – a highly regarded composer and performer, who later gained Hindemith's chair in composition at Yale, won a Pulitzer Prize

<sup>304</sup> Richard Donovan was acting dean at Yale from 1940-1, and was responsible, in part, for recruiting Hindemith.

for composition (1990) and became the first dean of the California Institute of the Arts.<sup>305</sup> Initially, Powell wrote music in a similar style to Hindemith, before moving to more complex works, both in terms of rhythm and pitch structure, such as his *Prelude for Piano*.<sup>306</sup> This shows a preference towards the (more fashionable) Darmstadt styles of Boulez and Stockhausen. One can conclude from the Yale entrance exam that Hindemith's expectation for general musicianship was unreasonable; Hindemith was hyper-critical of even the most promising students.



Example 8.3: Hindemith's memo to Richard Donovan, Yale Hindemith Collection.

Powell served on the board for *Journal of Music Theory* and *Perspective of New Music*, which highlights the diversity of his musical background; *JMT* was based at Yale and initially focused on Schenkerian analysis, while the contrasting *PNM* was based at Princeton and grew out of Babbitt's interest in serialism and set theory.<sup>307</sup> Despite the friction between the aesthetics of Babbitt's modernism and Hindemith's (relative) conservatism, and perhaps due in part to Powell's editorial presence, *PNM* published a Hindemith obituary in 1964. This included entries by Powell, Lukas Foss and Easley Blackwood. Powell must have thought favourably of his time

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<sup>305</sup> It should be noted, however, that while Mel Powell was included in this group, his comments are less damning than some of his peers. Hindemith wrote of him: 'gifted, very modern, without any experience, could become a decent musician, needs proper training. Reading good, reaction fast, transposing not bad, although very slow, singing decent.' The fact remains, however, that he was bracketed with the less competent candidates in Hindemith's summary.

<sup>306</sup> Mel Powell's *Prelude for Piano* is published in the album *American Contemporary Masters: A Collection of Works for Piano* (G. Schirmer, 1995) pp. 138-142, in the company of composers such as John Adams and Phillip Glass. It is therefore one of his most well-known works.

<sup>307</sup> Kerman, Joseph, *Contemplating Music: Challenges to Musicology* (Cambridge: Harvard University Press, 1985) p. 21, 'With Roger Sessions, [Babbitt] was the inspiration for a group of young composers and theorists at Princeton which would later be associated with *Perspectives of New Music*, an American answer to Die Reihe'.

at Yale with Hindemith, despite the trials of his entrance examination, judging by the following remarks:

Those of us who have firsthand knowledge of Hindemith's skills in these domains know that among the major composers of the period none could be ranked a more complete musician.<sup>308</sup>

Foss studied with Hindemith, albeit briefly, at Tanglewood (1940) alongside Bernstein. As a child prodigy, Foss had a strong enough musical personality to assimilate Hindemith's teaching within his own original voice. His *Capriccio* (1946), while containing the occasional quartal pitch collection, does not sound in any way like Hindemith, despite being written a year before Copland's remark 'all the young composers are writing like Hindemith'.<sup>309</sup> Similar to Powell, Foss had positive remarks to make about Hindemith in his obituary, describing him as 'Germany's greatest and most performed living composer'.<sup>310</sup> However, Foss describes how he, and many other composers, turned away from the Hindemith approach:

My gradual discovery ("triggered off by a pedagogic experiment: improvisation") of what is loosely called "extreme music" was like a betrayal to [Hindemith]. For all my love and respect for the master and his teachings, his axioms of right and wrong seemed no longer applicable to me. Other students of his music must have had a similar experience. Hindemith continued to write his masterful music. He went his way. New music went another.<sup>311</sup>

Foss also writes:

[Hindemith's *Unterweisung*] vision of a sane and sober order did not succeed. At least it failed to conquer us, perhaps because it was sane and sober, because it lacked the *irrational*, an element which Schoenberg's idea of order had to such a full measure and without any notion of order in the arts is peculiarly unattractive.<sup>312</sup>

The final obituary in *PNM* was written by Blackwood, who received his degree in theory from Yale under Hindemith (1950-1954), and who is one of the few musicians from Hindemith's class to be found in the *Grove Dictionary of Music and Musician*. Blackwood considered himself removed

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<sup>308</sup> Powell, Mel, 'In Memoriam: Paul Hindemith (1895-1963)' *Perspectives of New Music* Vol. 2 No. 2 (Spring-Summer, 1964) p. 1.

<sup>309</sup> Hindemith may have been disappointed by this: Foss was noted to have composed in Hindemith's style when a child prodigy: 'Lukas Foss is, in a way, the Wunderkind of this group of composers, and something of the aura of the Wunderkind still hangs about him. Born in Berlin, where he had his first music lessons, he continued his studies at the Conservatoire in Paris during the Hitler years, and finally arrived in New York with his parents at the age of fifteen. At thirteen he had already composed piano pieces (subsequently published by G. Shirmer) that are almost indistinguishable from those of his later master, Hindemith.' (*Copland on Music*, 1960, pp. 170-171)

<sup>310</sup> Foss, Lukas, 'In Memoriam: Paul Hindemith (1895-1963)' *Perspectives of New Music* Vol. 2 No. 2 (Spring-Summer, 1964) p. 2.

<sup>311</sup> *Ibid.*, p. 3.

<sup>312</sup> *Ibid.*, p. 2.

from the Hindemith style, and was a distinguished interpreter of Boulez's *Second Piano Sonata*.<sup>313</sup> He also studied with Messiaen and Boulanger. And yet, in his Fifth Symphony (1990), he quotes the 'Dies Irae' motif – the first subject for analysis at the end of the *Unterweisung* – showing that Hindemith's influence remained, perhaps inadvertently. Blackwood wrote uncompromisingly on the problems caused by Hindemith's personality:

Among his colleagues and former students Hindemith leaves few friends; indeed, some of his students feel that he ruined them creatively.<sup>314</sup>

Whether one agrees with his approach to pedagogy, these reminiscences show that some students harboured resentment towards Hindemith. They disliked the way he began all teaching from the very beginning, such as exercises in two-part writing (*Unterweisung II*), and the implicit way that this led them to emulate his own style, rather than to develop their own voice. His entrance exam to Yale, and comments on student's work, also show him to have expected unusually high standards. This contributed towards the hindrance of the dissemination of his music and music theory. Hindemith had damaged the future of his work in a way that Schenker had not.

## 8.2 Hindemith's Imitators and Students

Not all of Hindemith's students regretted their time with Hindemith, and many went on to emulate his compositional style. This was particularly the case in Berlin, where the students Reizenstein (1930-1934), Ernst Pepping (c. 1927-1930), Arnold Cooke (1929-1932), Walter Leigh (1927-1929) and Genzmer (1928-1934), went on to pursue successful careers in composition at a national level.<sup>315</sup> This list includes two British students (Cooke and Leigh), and Reizenstein, who was to emigrate after fleeing Germany in 1934. Hindemith provided a reference for Reizenstein to enrol at the Royal Academy of Music, London, with very kind words: not the same approach

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<sup>313</sup> McKay, James R., 'Easley Blackwood' *Grove Online*, accessed 19 November 2012.

<sup>314</sup> Blackwood, Easley, 'In Memoriam: Paul Hindemith (1895-1963)' *Perspectives of New Music* Vol. 2 No. 2 (Spring-Summer, 1964) p. 4.

<sup>315</sup> In the various biographical notes concerning Ernst Pepping, it states that he studied in Berlin from 1924 with Walter Gmeindl. However, Skelton (1977, p. 86) writes that he studied with Hindemith, which must have occurred at some point from 1927-30.

that Hindemith later took towards his Yale students.<sup>316</sup> Bernard Heiden, a Berlin student, was also a strong advocate of Hindemith's work, as shown in his summary article on the *Unterweisung* (1942).<sup>317</sup>

Reizenstein was one of Hindemith's most ardent defenders in the British language, which materialised in two published documents.<sup>318</sup> The first, a eulogy published in *The Listener* (from 19 March 1964), unswervingly praises Hindemith:

When Paul Hindemith died suddenly at the age of sixty-eight, only three months ago, the world of music lost one of its greatest figures. He was a musician of giant stature whose attainments as composer, viola player, conductor, teacher, theorist, author and philosopher have rarely been equalled in the whole history of music.<sup>319</sup>

It also defends Hindemith from his critics:

Some irresponsible critics, over-anxious to jump on the 'avant-garde' band-wagon, present a false picture of Hindemith's position in present-day music; but most musicians agree that his music will live for a long time to come.<sup>320</sup>

Reizenstein's second article is a passionately-worded response to Redlich's Hindemith critique (1954, discussed in the previous chapter as part of *The Music Review*). It dissects Redlich's article, by aiming to show that he has projected his own war trauma upon Hindemith's life and work.

There are many compelling points:

Dr Redlich ... poses the following question:

Is it possible that Hindemith's increasingly precarious personal situation in the years between 1933 and 1938 led to a stiffening of his attitude against Schoenberg and his school, perhaps with an afterthought that this might lead to his eventual vindication even in Hitler's Germany?

The insinuation that political opportunism on Hindemith's part led to a stiffening of his attitude against Schoenberg in the Third Reich is monstrous. As his attitude towards twelve-note composition had always been negative, the question of stiffening could not arise....one cannot help wondering why [Redlich's] article on Hindemith did not appear during the composer's lifetime. It was published only a few months after Hindemith had died and could lead to a falsification of an important chapter in recent musical history.<sup>321</sup>

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<sup>316</sup> I am grateful to John Reizenstein, Franz's son, for providing me with a copy of Hindemith's reference.

<sup>317</sup> Heiden, Bernhard, 'Hindemith's System – A New Approach' *Modern Music* Vol. 19, No. 2 (Jan-Feb 1942) pp. 102-7.

<sup>318</sup> Reizenstein, Franz, 'Paul Hindemith' *Essays on Music: an Anthology from The Listener* (London: Cassell, 1967) pp. 132-136 and 'Hindemith: some aspersions answered' *Composer* 15 (April, 1965) pp. 7-9. See also Leigh, Walter 'The Music of Paul Hindemith' *The Listener* (London: Cassell, 1967) pp. 127-131.

<sup>319</sup> Reizenstein, Franz, 'Paul Hindemith' *Essays on Music: an Anthology from The Listener* (London: Cassell, 1967) p. 132.

<sup>320</sup> *Ibid.*, p. 136.

<sup>321</sup> Reizenstein, Franz, 'Hindemith: some aspersions answered' *Composer* 15 (April, 1965) p. 7.

Powerful and persuading as this may be, it is unfortunate that Reizenstein chose not to publish his work in *The Music Review*, where Rehdlich's article was first published. His writing was not afforded the exposure necessary for it to have an international impact, which is ill-fated given that Reizenstein was one of the most stalwart, and notable, of Hindemith's supportive former students.

Reizenstein's compositional style holds close affinities to the *Unterweisung*, and it is likely that many of Hindemith's theoretical ideas would have been introduced to him as a student in Berlin during the early 1930s. There is also evidence in the obituary writings of Alan Bush and David Wilde (1969) that Reizenstein was closely acquainted with the *Unterweisung*.<sup>322</sup> Bush recollects:

Reizenstein accepted Hindemith's general theory of composition set forth in the book, *The Craft of Musical Composition*, and I well remember that ... we spent three evenings going through this great treatise most carefully and discussing its theoretical implications. It is very rare that composers get together in this country [the UK] and discuss seriously the theory of composition; I had studied Hindemith's book carefully and had written voluminous notes on it, which I discussed with him. He himself had never discussed it with anyone before – no one else had seemed to want to do so – and he was very pleased to find somebody who was prepared to spend adequate time to go through it thoroughly. You could not have found anyone better informed or with a profounder grasp of the implications of Hindemith's theory than Franz himself.<sup>323</sup>

Reizenstein's compositions focused on those for the piano, and for chamber groups, in a style that balances 'the lyrical expansiveness of Vaughan Williams and the English tradition'.<sup>324</sup> His *Twelve Preludes and Fugues* op. 32 for piano is one of his most widely-disseminated works. Completed in 1955, it was dedicated to Paul Hindemith with 'sincerest admiration' and, in direct homage to the *Ludus Tonalis*, orders the fugues in accordance with Series 1.<sup>325</sup> This is stated on the inside cover to the score, to make this parallelism explicit. The opening of the first prelude is also structured around Series 1; however, it is treated as a dodecaphonic row, rather than the pitch hierarchy that Hindemith intended (example 8.4). With the exception of the C in bar seven, no pitches in the row are repeated.

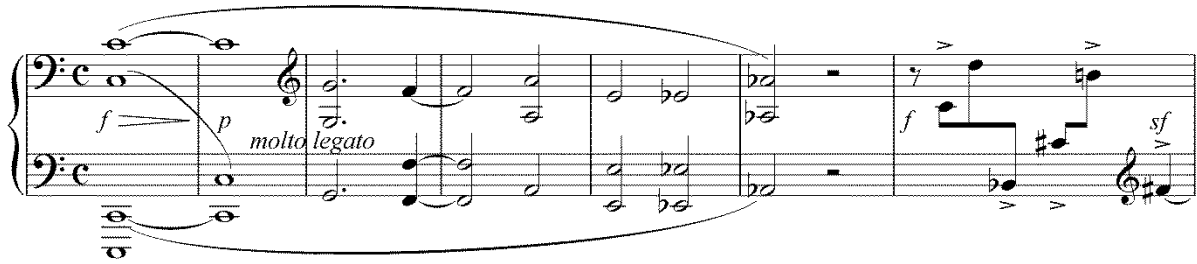
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<sup>322</sup> Obituary of Franz Reizenstein, by Alan Bush and David Wilde, *The Royal Academy of Music Magazine* No. 196 (Midsummer, 1969) pp. 24-28.

<sup>323</sup> *Ibid.*, p. 25.

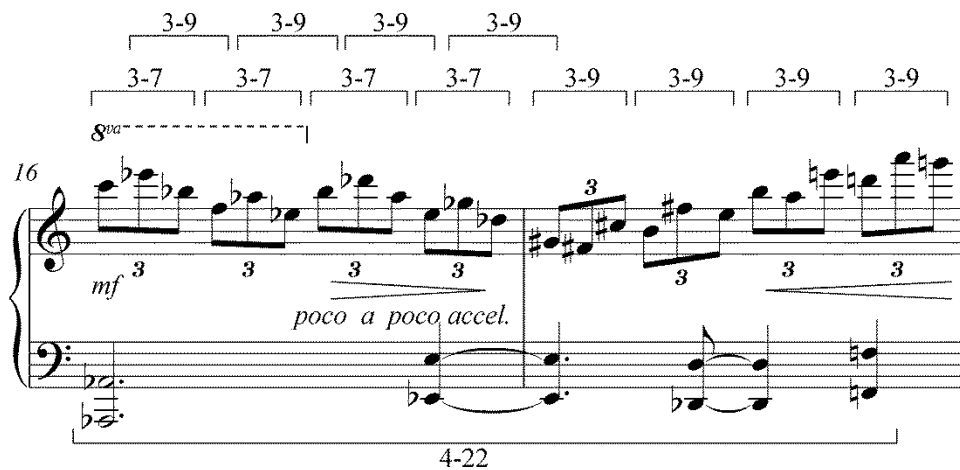
<sup>324</sup> Cole, Hugh & Miller, Malcolm, 'Franz Reizenstein' *Grove Online*, accessed 20 November 2012.

<sup>325</sup> Wilde (1969) p. 29, recalls that Reizenstein referred to Hindemith's *Ludus Tonalis* as 'like a Credo to me'.



Example 8.4: Reizenstein, *Twelve Preludes and Fugues*, First Prelude, bb. 1-7, Series 1 arrangement.

Bars 16-17 in example 8.5 precede an appearance of the row in the bass. They are accompanied in the right hand by quartal pitch collections. Using the salience characteristic of metric groupings, each triplet forms pc-set 3-7: which may be read as an incomplete quartal trichord. If this segmentation is moved forwards by one triplet quaver, then each group of three forms a descending pattern of fourths, 3-9. The bass line also forms the incomplete tetrachord 4-22, missing a B $\flat$  to complete a chain of fourths. It is strongly reminiscent the first song from *Das Marienleben*, ‘Geburt Mariä’ bars 21-24, in both 1923 and 1948 versions (analysed in chapter six, example 6.11).



Example 8.5: Reizenstein, *Twelve Preludes and Fugues*, Prelude no. 1 in C, bb. 16-17.

Reizenstein’s fugues in this cycle range from two to five part works, which is identical to J. S. Bach’s WTC, and contrasts with Hindemith’s preference for solely three part fugue writing. In *Twelve Preludes and Fugues*, Reizenstein’s technique is based on Hindemith’s *Unterweisung* approach to harmony and counterpoint. His fugue subjects are similar to the third category from the *Ludus Tonalis*: salient quartal pitch collections, covered by foreground ornamentation, such as passing

notes.<sup>326</sup> This may be said of fugues 1, 3, 4, 6, 7, 8, 9, 10 and 11. Similar to the *Ludus*, the final fugue (in F#) possesses the least quartal subject of the cycle. These subjects also contain other curiosities, which echo Hindemith's approach to post-tonal fugue writing: the fourth subject includes eleven of the twelve chromatic pitches, despite outlining a quartal pitch framework; the eighth has the character of a gigue; and the ninth implies a cycle of fifths.

Examples 8.6 and 8.7 show the fourth and tenth fugue subjects, respectively. The background structure of the fourth fugue is quartal, as is the majority of foreground material. The tenth fugue subject ends with two salient 3-9 trichords.

Example 8.6: Reizenstein, *Twelve Preludes and Fugues*, Fugue 4 in A, subject with a structural analysis.

Example 8.7: Reizenstein, *Twelve Preludes and Fugues*, Fugue 10 in D $\flat$ , subject.

Reizenstein builds on the concept of quartal pitch sequences, also found in *Marienleben II*. The fourth prelude (in A) includes a passage built around a descending pattern of 4-23 tetrachords, which alternates with the incomplete quartal tetrachord 4-26, and the quartal pentachord 5-35. It also contains pitch centricity, beginning and ending on C.

<sup>326</sup> See chapter five, p. 6 for a description of these categories.

27

4-26 4-23 4-26 4-23 4-26 4-23 5-35 4-23

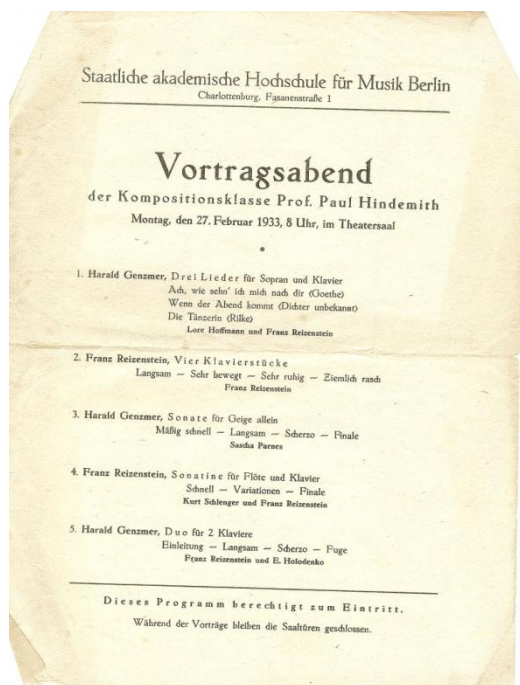
Example 8.8: Reizenstein, *Twelve Preludes and Fugues*, Prelude 4 in A, bb. 27-30, quartal pitch sequence.

Reizenstein was a highly respected and influential figure at the Royal Academy of Music in the second half of the twentieth century, whose support for both Hindemith's music and personality was unwavering. It is therefore unfortunate that he did not publish more texts in defence of Hindemith, particularly concerning the value and relationship of his music theory to contemporary composition. It is also unfortunate that the material he did publish was only available in secondary journals, rather than major academic periodicals. Reizenstein died five years after Hindemith, in 1968. During the 1960s, under attack from Darmstadt and moving increasingly out of fashion, Hindemith sorely needed such a strong advocate to come forward more prominently.

Another of Hindemith's Berlin students to achieve some success as a professional composer was Genzmer (1909-2007). Genzmer's music holds an even closer affinity to Hindemith's *Unterweisung* style than Reizenstein's. Like Hindemith, Genzmer wrote for a wide variety of 'practical' instrument combinations, which were likely to receive regular performances, such as numerous instrumental sonatas with piano for marginalised orchestral instruments, including the bass tuba and double bass. He also reflected the activities of the Berlin Rundfunkversuchsstelle and Trautwein by writing music for the trautionium, including two concertos. Partly due to

Genzmer's long lifespan (he lived to the age of 98) his output is large, encompassing over 300 works.

Hindemith considered Genzmer, along with Reizenstein, to be a promising student; an attitude that was harder to find towards his students from the United States. He afforded both students opportunities to have their works performed in his faculty concerts, and one such programme has been passed down by Franz's son, John Reizenstein, showing that these two composers comprised the entire schedule:



Example 8.9: a concert including the music of Genzmer and Reizenstein on 27 February 1933.

Over ten years after Hindemith resigned from Berlin, Genzmer published his *Sonata for Two Pianos* (1950). Similar to Reizenstein, this adapts the idea of a quartal sequence, which was found in the revised *Marienleben*, published two years earlier. The following passage ornaments a background structure of ascending fifths, which is given salience by metric position and pitch duration:

50

*cresc.*

*mp cresc.*

*p*

8<sup>va</sup>

54

8<sup>va</sup>

*mf*

added F#

57

*f*

8<sup>va</sup>

*f*

*f*

Example 8.10: Genzmer's *Sonata for Two Pianos* (1950), third movement, bb. 50-59.

The extract is based on a quadruple canon at the unison, where each voice enters after four beats, accompanied by a bass ostinato. The use of quartal harmony facilitates the composition of such canons, which occur in Hindemith's exercises in *Traditional Harmony II*, published during this time (1948/ 1953).<sup>327</sup> The semiquaver runs in the right hand of piano two, such as those found in bars 52-53, also ornament quartal collections.

Further aspects of this passage that parallel Hindemith's *Unterweisung* style include conservative performance directions and clearly defined contrapuntal voices. However, while the concept of quartal progressions may be connected to Hindemith's post-*Unterweisung* style, Genzmer's foreground contains many more foreground ornaments which do not directly belong to quartal collections. This includes the prominent E $\flat$  in the bass in the final chord of this passage, which is harmonically destabilising given its prominence in the bass, and distance from the rest of the 4-23 quartal tetrachord. This prevents it from sounding identical to Hindemith.

Genzmer's *Second Piano Sonata* was published in 1942, the same year as the *Ludus Tonalis*. The fourth movement is a fugue of 82 bars in length. The subject (example 8.11) is Paradigm 3, with a background quartal structure, similar to fugues from the *Ludus* and Reizenstein's subsequent *Twelve Preludes and Fugues*.

The image displays a musical score for a piano extract. The top part shows a quadruple canon with a dynamic marking of 'ff'. The bottom part, enclosed in a box, shows a melodic line with a 4-22 interval and a 6-32 interval, with a 3/2 time signature change.

Example 8.11: Genzmer's *Second Piano Sonata* (1942), fourth movement, bb. 50-59.

<sup>327</sup> Hindemith, *Traditional Harmony II* (1953) p. 3.

Bentzon (1919-2000), while not a student of Hindemith, was one of his most ardent supporters. He was strongly influenced by Hindemith's style, and his substantial list of compositions dwarfs even that of Genzmer, numbering over 630 works, and including many uncommon instrumental combinations. Bentzon's monograph (1997) listed numerous works, by other published composers, that bear the influence of Hindemith.<sup>328</sup> It includes a mixture of compositions by Hindemith's students (Genzmer and Pepping), and works by other twentieth century composers, including Karlheinz Stockhausen, *Klavierstück X* and Luigi Dallapiccola, *Musica per tre pianoforte*.<sup>329</sup>

Bentzon's *Trumpet Sonata* op. 73 (1951-1952) closely resembles the *Unterweisung* style.<sup>330</sup> Bars 21-25 of the first movement illustrate this in three ways: the piano accompaniment includes explicit quartal pitch collections (particularly bars 23-24); there is a priority for contrary motion between parts; and the performance directions are clear and conservative. Moreover, the quartal chords from bars 23-24 resemble Hindemith's piano accompaniment to the second movement of the *Viola Sonata* (1939), in example 8.13.

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<sup>328</sup> Bentzon, Neils Viggo, *Paul Hindemith* (Copenhagen: Artia, 1997):

Humphrey Searle, *Symphony No. 5* Op. 43  
 Ernst Toch, *Erste Symphonie* Op. 72  
 Elmut Degen, *Kammersinfonie* (II. Sinfonie)  
 Henk Badings, *Sonate IV* (1945, klaver)  
 Harad Genzmer, *Second Sonate* (klaver)  
 Ernst Pepping, *First Sonata I* (klaver)  
 Alan Rawsthorne, *Tema, variationer og finale* (ork.)  
 Kurt Weill, *First Sinfonie* (1924)  
 Lennox Berkeley, *Guitar Concerto* Op. 38  
 Karl Amadeus Hartmann, *Sixth Symphony*  
 Conrad Bech, *Hommage* (ork.)  
 Willem Pijper, *Symfoni nr. 3*  
 Ernst Pepping, *Symphonie*  
 Slavko Osterc, *Sonatine* (2 klarinetter)  
 Roman Vlad, *Griochi con Bach* (sol. Clavicembalo)  
 Karlheinz Stockhausen, *Nr. 4 Klavierstück X*  
 Erik Satie, *Morceaux en forme de poire*  
 Ingvar Lidholm, *Poesis* (orkester)  
 Sylvano Bussotti, *Opus Cygne* (orkester)  
 Luigi Dallapiccola, *Musica per tre pianoforte*

<sup>329</sup> The inclusion of a work by Dallapiccola is not surprising, given the high regard with which the Italian composer held Hindemith. His letter to Gertrud Hindemith on 30th December 1963 is both poignant and revealing of the wider regard with which the composing community held Hindemith. This letter is reprinted in Briner, Andres 'Zwei Hindemithiana', *Neue Musik und Tradition* (Laaber: Laaber Verlag, 1990) pp. 535-536.

<sup>330</sup> No date of composition appears available for this work, although Bentzon's preceding op. 71 was published in 1951, and succeeding op. 82 in 1952.

Example 8.12: Bentzon's *Trumpet Sonata* op. 73 (1951-1952). The trumpet part was originally written in B $\flat$ , and has been transposed to concert pitch for ease of use.

Example 8.13: Hindemith's *Viola Sonata* (1939), second movement, bb. 147-150.

It is no coincidence that many of the examples provided here of Reizenstein, Genzmer and Bentzon are fugues, or that they are explicitly contrapuntal. Hindemith's approach to quartal pitch collections, and emphasis on voice-leading technique, lends itself well to this genre. It also offers one solution to the problem of writing fugues in a post-tonal idiom: quartal pitch collections are invertible, while still allowing for audible foreground ornamentation, such as passing notes. Quartal pitch collections have also remained in use for brass instruments, both in chamber settings (particularly in the music of Hindemith, Genzmer and Bentzon) and in choirs, such as *Apparebit Repentina Dies*, found in example 3.6 of chapter three. This may be related both to the use of the harmonic series in *Unterweisung* theory, and the importance of this series to the invention of the modern brass instrument.

Aside from these published composers, no student from Yale, who wrote in the *Unterweisung* style, gained a lasting international career in composition. Many students, however, wrote in this way. Carl Miller's *Clarinet Sonatina* (1947) was written in the year Copland made his derogatory remark about composers writing like Hindemith. Bars 33-37 include incomplete quartal

collections 3-7 and 4-22, and the quartal tetrachords on the downbeats of bars 36 and 37. Whatever Miller's compositional personality may have been, it is only heard in his Yale music work through the implicit agenda of Hindemith's *Unterweisung* teaching.

Example 8.14: Carl Miller, Clarinet Sonata (1947), first movement, bb. 33-37. The clarinet part was originally written in Bb, and has been transposed to concert pitch for ease of use.

Hindemith's corrections to student assignments show that he actively encouraged them to write in his own style. Example 8.15 is taken from a trumpet and piano piece by Charles Shackford. Each of Hindemith's three corrections to the trumpet part aligns the melody more closely to quartal pitch collections.

Example 8.15: Hindemith corrections (in red) to Charles Shackford's trumpet piece.

The Yale Hindemith Collection includes many programmes to student concerts during the 1940s. These show the impact of Hindemith on not only the musical style of his students, as seen in Carl Miller, but in the very genres they wrote in. The following programme took place in Sprague Memorial Hall on 2 May 1944, entitled 'Concert of Compositions by Students in the School of Music':

Compositions in Strict Form:

Fugue in F	Lillian Clark
Loure, From a Suite	Lee Goebel
Fugue in C Minor	Jon Thorarinsson
Fugue in Eb	Elizabeth Baldwin
Intermezzo from Sonata for Violin and Piano	Agostino Rosselli
Sonatina for Oboe and Harp	Charles Shackford
Piece for Viola and Harp	Shau-Kwong Tam
Three Piano Pieces	
Sonatina for Piano	Willson Osborne
Allegro	
Andante	
Allegro	
Andante from Sonata for Violin and Piano	Leonard Sarason
Three Pieces	Charles Shackford
I. Quick movement, piano	
II. Slow movement, clarinet and piano	
III. Quick movement, trumpet and piano	
Sonata for Double Bass and Piano	Joseph Iadone
Allegro	
Adagio	
Scherzo: Presto	

This concert bears all the hallmarks of Hindemith's eclectic compositional output. Notable on the programme is a work for trumpet and piano, presumably based on Hindemith's *Sonata for Trumpet and Piano* (1939) and one for *Double Bass and Piano*, which precedes Hindemith's own work, which was not published until 1949. This shows that the genres, and marginalised (yet practical) instrumental combination, favoured by Hindemith, in addition to his *Unterweisung* style, were emulated by his students.

### 8.3 Cross-Roads in Music Theory and Aesthetics

Hindemith held the prominent Battell Chair in Music Theory (1947-1953), the first endowed chair of music in the Yale School of Music (and in the latter half of the twentieth century, the University), which was subsequently held by Allen Forte and, currently, Richard Cohn.<sup>331</sup> He received many recognitions of merit while in the US, in addition to becoming an American citizen on 11 January 1946: the Howland Memorial Prize Medal from Yale University (1940); membership of the Institute of Arts and Letters (1947); New York Music Critics Award and honorary doctorates in music from the Philadelphia Academy of Music (1945), and Columbia University (1948). During this time, he was one of America's most revered composers and musical thinkers. The music editor of *Time* magazine wrote in 1948 that, 'few living composers have ever had so much of their music played in one week. Everyone seemed to burst out playing the knotty dissonant music of Paul Hindemith'.<sup>332</sup> Hindemith received fourteen commissions during his time in the US, more than any other composer.<sup>333</sup>

However, several events transpired that were to dramatically out-fashion both Hindemith's compositional style and his *Unterweisung*-based theoretical approach. These included the damning articles printed in *The Music Review* (examined in the previous chapter), the evolution of Babbitt's approach to twelve-tone theory, the dissemination of Schenkerian theory in the English language, and the musical fashions of the 1960s avant-garde, associated in part with the Darmstadt School.

Forte (1995) traces the beginning of the demise of Hindemith's influence to Schoenberg's Princeton lecture of 1934, 'Composition with Twelve Tones'. This began a trend in music theory

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<sup>331</sup> Forte's seminal article ('Paul Hindemith's Contribution to Music Theory in the United States', 1995) on the influence of Hindemith in the United States was a starting point for this chapter.

<sup>332</sup> Noss, Luther, *Paul Hindemith in the United States* (Urbana: University of Illinois Press, 1989) p. 155.

<sup>333</sup> *Ibid.*

and composition firstly based on serialism, and secondly, on ways of identifying it and other ordered, yet non-tonal music. Babbitt was the first to propose a musical set theory (1955), which was later codified in Forte (1973). The exposition of Schenkerian theory in the English language occurred with Salzer's *Structural Hearing* (1952). Despite Forte's apologetic Hindemith article, his work was based heavily on the creation and development of set theory and voice-leading reduction.

The manner of Hindemith's departure from Yale is also partly responsible for his dramatic fall from grace, particularly within the music theory community. From the first term of 1948-1949, Hindemith was continually away from his work at Yale. This began with a leave of absence to complete a schedule of conducting in Europe (winter 1948), lectures in Germany (spring 1949), the Norton Lectureship at Harvard (1949-1950) and a professorship at the University of Zurich (1951-1952). He resigned from Yale at the end of June 1953.<sup>334</sup> These engagements created discontinuity in his teaching. Given the special dispensations afforded by Yale (and the Dean, Bruce Simmonds) to allow Hindemith to be away from the department, it was particularly damaging that he should resign without warning in 1953. This is summarised by a concerned letter from Gertrud to Hindemith's publisher, Willy Strecker, where she writes 'Please do not say anything about our moving back to Europe. People are beginning to ask hard questions as to whether we are leaving America forever, and are deeply disturbed, disappointed, bitter, etc.'<sup>335</sup> History has shown Gertrud's worries to have been justified. This is confirmed by Alexander Main, whose speech on Hindemith in 1973 mentioned 'Yale University a decade ago felt that it had "outgrown Hindemith", as a young faculty member of that time put it.'<sup>336</sup> Hindemith sorely needed the support of the Yale theoretical community, which remains today one of the world leaders in speculative music theory.

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<sup>334</sup> Ibid., pp. 88-90.

<sup>335</sup> Ibid., p. 91.

<sup>336</sup> Main, Alexander, 'Hindemith Tomorrow: a dedicatory address' (delivered at Ohio State University, 8 December, 1973).

The two first journals to prioritise music theory and analysis in the United States were *JMT* (1957) and *PNM* (1962). As mentioned previously, they each lent upon one of the two pillars of Anglo-American music theory: Schenkerian analysis at *JMT* and set theory at *PNM*. In Kerman's 1985 survey of musicology, which includes a discussion of both journals and their associated scholars and music faculties, Hindemith does not receive a single mention. Further misfortune meant that in the same year as Salzer's *Structural Hearing* (1952), Mendel, the translator of the *Unterweisung*, was appointed professor of music at Princeton: a key institution associated with Hindemith's demise.

The oldest journal of its kind in the USA, the *Journal of Music Theory* was founded in Yale by David Kraehenbuehl in 1957, who, along with Boatwright, was one of the four students who graduated with both music theory and composition under Hindemith. While Hindemith had left the US by this stage, it is likely that his previous work in music theory had acted as an incentive to found the journal. The presence of many former students is also to be found in articles and on the editorial board, such as Powell and Boatwright. Particularly in the first few editions of the journal, there was an interest in the general problems of music theory, such as consonance and dissonance, and on some of the issues raised by Hindemith's theory such as interval sizes. Throughout the 1960s there were also a number of articles dedicated to Hindemith such as Shackford (1972), Thomson (1965) and Briner (1961). That there was a strong affinity not only for Hindemith, but for the presence of nature in music theory more generally was felt in a short comment by Carter (1959).<sup>337</sup> This comment was directed at the editorship of the *Journal of Music Theory*, and included the following: 'You lean, editorially, rather too heavily on the notion of the "physical" or "natural" basis of music theory as one would expect from the followers of Hindemith. I would like to see other points of view given a fair hearing.' This is not to suggest that Carter disliked Hindemith, however, given his beautifully worded letter to Getrud following

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<sup>337</sup> Carter, Elliott, 'On the Nature of Music Theory' *Journal of Music Theory* Vol. 3, No. 1 (April, 1959) p. 170.

Hindemith's death in 1963, which included praise for his contribution to American musical pedagogy.<sup>338</sup> Whether this letter was directly influential or not, past Shackford's article in 1972 interest in Hindemith's theories in the *Journal of Music Theory* fell dramatically: there was not a single major article until Forte (1998).

The attempts of Forte (1995) to demonstrate that Hindemith's theories had an unfortunate reception fell on deaf ears, as is indicated in Yosef Goldenberg, 'Journal of Music Theory over the Years: Content Analysis of the Articles and Related Aspects' (2006).<sup>339</sup> Goldenberg lists the number of journal articles, which he splits into different categories, which include Schenker, set theory, rhetoric, Riemann and neo-Riemann amongst others. Hindemith is conspicuously absent. Using this data Goldenberg concludes that, 'The most common methods discussed in *JMT* are clearly Schenkerian theory and set theory.'<sup>340</sup> The only time Hindemith is referenced is Forte (1998), to debate whether this article should appear in either the categories of set theory or Schenker. Finally, the article points to the mention of Hindemith mainly as a theorist in *JMT*, with the impression that this is somehow surprising, rather than referring to him as a composer.<sup>341</sup>

Hindemith's theories were a cause of widespread fascination in America in the early 1940s, and lead to two important invitations. The first was to give a lecture on 'Music Theories' for the New York Chapter of the American Musicological Society on 24 May 1943. The second was an invitation from the *Musical Quarterly* that culminated in his 1944 article, 'Methods of Music Theory', which provides information on Hindemith's theoretical source material.<sup>342</sup> Moreover, there are at least three significant dissertations by Thomson, Halliday and Landau which

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<sup>338</sup> Letter dated 3 January 1964 and published in *Neue Musik und Tradition* (Laaber: Laaber Verlag, 1990) p. 533.

<sup>339</sup> Goldenberg, Yosef, 'Journal of Music Theory over the Years: Content Analysis of the Articles and Related Aspects' *Journal of Music Theory* Vol. 50, No. 1 (Spring 2006) pp. 25-63, Fiftieth Anniversary Issue.

<sup>340</sup> *Ibid.*, p. 40.

<sup>341</sup> *Ibid.*, p. 54.

<sup>342</sup> Noss, Luther, *Paul Hindemith in the United States* (Urbana: University of Illinois Press, 1989) p. 143.

remained unpublished, as mentioned in the previous chapter.<sup>343</sup> This small juncture in Hindemith scholarship, from the early 1940s to 1970s, represented academic investigation into his theories while interest was high – however, they have disappeared into relative obscurity. None of these texts made it into Neumeier’s monograph (1986) apart from Landau’s article (1960), derived from his dissertation.

## The ‘Practical’ Harvard School

Despite Hindemith’s lifelong mantra, ‘playing, playing, always the practical’ the *Unterweisung* is a largely speculative text.<sup>344</sup> The development of a new concept of tonality is unlike the observational work of Piston and Schoenberg, and the stylistic description of Messiaen, all of whom had highly successful schools in Harvard, California and Paris respectively. Piston paralleled Hindemith closely: born in 1894, a year before Hindemith, he spent much of his professional life teaching, composing, and writing music theory. Piston nurtured a practical approach towards composition instruction during his long tenure at Harvard (1926-1960). His manuals *Harmony* and *Orchestration* (and to a lesser extent, *Counterpoint*) have retained their place in pedagogy up to the present day. They emphasise a practical approach, based on the study of existing scores from the mainstream canon of Western Classical Music. They are observational, rather than speculative. Piston’s approach to teaching created the opposite effect to Hindemith’s: he had very little stylistic influence upon his students. The following is taken from an interview in the *New York Times* (1961):

Sometimes I had the impression that they wound up doing the teaching and I was the student. I am very proud of the fact that none of my students writes music like any other, and none writes music like me, grazia a Dio.<sup>345</sup>

By contrast, Messiaen’s *Technique de mon Langage Musical* is a personal description of one approach to composition. This is of use to anyone wishing to precisely emulate Messiaen’s style, or to

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<sup>343</sup> To this one could also add Cazden, Norman, ‘Consonance and Dissonance’ (PhD: Harvard, 1947).

<sup>344</sup> Salzman, Eric, ‘Paul Hindemith, Master of Many Trades’ *New York Times* (15 Feb, 1959) p. x9.

<sup>345</sup> Salzman, Eric, ‘Piston: Ex-Teacher’ *New York Times* (26 March, 1961) p. x13

analyse his music based on his own principles. Unlike the introduction to the *Unterweisung*, Messiaen makes his intentions clear:

Aside from a few very rare exceptions pointed out in passing, all the examples quoted here will be from my own works (past or future!)...*The Technique of My Musical Language*, language considered from the triple point of view, rhythmic, melodic and harmonic. This work is not a treatise on composition.<sup>346</sup>

Both forms of work: observational (Piston) and personal (Messiaen) are explicit in their approach to theory and style description. The two approaches have also instructed internationally prominent composition students. A selection from these students shows not only that Piston and Messiaen taught some of the major figures in late-twentieth-century music composition, but also in a variety of styles. Messiaen inspired a legacy of composers, more so than published theorists:

#### **Oliver Messiaen: Paris**

Olivier Alain  
George Benjamin  
Pierre Boulez  
Alexander Goehr  
Robert Sherlaw Johnson  
Oliver Knussen  
Quincy Jones  
Karlheinz Stockhausen  
Iannis Xenakis

Piston's Harvard students include the prominent composers and international figures of Carter, Leroy Anderson and Bernstein.<sup>347</sup> It is possible that the breadth of personalities in this selection – Carter as a pioneer of exhaustive pitch combination methods, Bernstein as a man of broad musical talents, and Anderson of popular idioms – could not have flourished under Hindemith's strict regime. Moreover, Carter and Bernstein achieved fame well beyond that of Piston, a success not found in Hindemith's Yale classes. It is unlikely to be coincidental that Cazden, author of the damning polemic on Hindemith in *The Music Review*, was also a member of Piston's class.

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<sup>346</sup> Messiaen, Oliver *Technique de mon Langage Musical* (Paris: Alphonse Leduc, 1944) preface p. 1.

<sup>347</sup> This list is taken from Pollack, Howard, *Harvard Composers: Walter Piston and his Students, from Elliott Carter to Frederic Rzewski* (The Scarecrow Press, Inc.: Metuchen, N.J., & London, 1992) pp. xiv-xv. Pollack states that the exact number of Piston's Harvard students is kept in secret in the Harvard archives. This is therefore only a selective list.

### Walter Piston: Harvard

John Vincent	Henry Ireland Clarke	Elliott Carter	Leroy Anderson
Henry Lasker	Josef Alexander	Arthur Berger	Everett Helm
Norman Cazden	Gail Kubik	Irving Fine	Gordon Binkerd
Ellis Kohs	Coleridge Braithwaite	Leonard Bernstein	Charles Shackford
Victoria Glaser	Joseph Goodman	Roslyn Brogue	Robert Middleton
Robert Moevs	Paul Des Marais	Harold Shapero	Betsy Warren
Douglas Allanbrook	Allen Sapp	John Bavicchi	Yorgos Sicilianos
Nicholas Van Slyck	Russell Woollen	Daniel Pinkham	Noël Lee
Billy Jim Layton	Klaus George Roy	Claudio Spies	Karl Kohn
Samuel Adler	Yehudi Wyner	Archibald Davison	Rosamond Brenner
Martin Boykan	Peter Westergaard	John MacIvor Perkins	Anthony Zano
David Behrman	Frederic Rzewski	John Harbison	Mark DeVoto
Joel Lazar			

By way of contrast, the following lists comprise Hindemith's students, which are categorised by Berlin and Yale institutions. They consist of technically accomplished musicians, theorists and pedagogues, but no single figure made an impact on the music historiography of the twentieth century comparable to the students of Piston or Messiaen.

### Paul Hindemith: Berlin<sup>348</sup>

Harold Genzmer	Ludwig Grünbaum	Ignaz Spiegel	Paul Schoop
Siegfried Borris	Arnold A. Cooke	Franz Reizenstein	Rudolf Wittelsbach
Oskar Sala	Sidney Sukoening	Zoltán Gardónyi	Paul Lamartine-Yates
Arno Erfurth	Remi Gassmann	Fritz Schäfer	Willy Schuster
Kakuzo Shimofusa	Hugo Fricke	Hans Michelsen	Walter Kraft
Konrad Noetel	Alwin Gindele	Felix Walther	Gerhard Rößner
Rudolf Unkel	Yoshitako Sakamono	John Colman	Ernst Pepping
Paul Weiß	Walter Leigh	Bernhard Heiden	Fritz Stummel
Helmut Spittler	Heinrich Jacoby		

### Paul Hindemith: Yale<sup>349</sup>

Anthony Barbieri	Leonard Berkowitz	Easley Blackwood	Harold Blumenfeld
Howard Boatwright	Martin Boykan	Michael Brotman	Joseph Carlucci
Walter S. Collins	John Cowell	John C. Crawford	James Darling
Antonio de Almeida	Sam Di Bonaventura	Joseph Dunlap	Charlotte Durkee
Philip Hwang	Joseph Iadone	Alvin King	David Kraehenbuehl
George Lam	Frank Lewin	Donald Loach	Carl S. Miller
Jean Todd Moran	Franklin Morris	Ben Quashen	Peter Ré
William Rice	Eckhart Richter	Hans Rudas	Leonard Sarason
Nicholas England	Alvin Etlar	Thomas Goodman	Robert Gottlieb

<sup>348</sup> I am grateful to Antje Kalcher of the Berlin Universität der Künste for helping me to compile this list. It is not complete, as the conservatoire records do not always show clearly which student was assigned to which class. The names are taken from the entrance examination to Hindemith's composition class from 1927-1937, combined with the names of student compositions in Hindemith's concert evenings. There are likely to have been more, particularly those connected with the Rundfunkversuchsstelle.

<sup>349</sup> Noss, Luther, *Paul Hindemith in the United States* (Urbana: University of Illinois Press, 1989) p. 203, lists the 47 students who earned degrees in theory or composition under Hindemith at Yale.

Robert Hickok  
Charles Shackford  
Eugene Weigel

Lee Howard  
Frank Smith  
Frank Widdis

George Hunter  
John Strauss  
Yehudi Wyner

Ruth Schönthal  
Jon Thorarinsson

The Berlin and Yale lists may be reduced to further illustrate their presence on the margins of music historiography. Of all the musicians who studied under Hindemith, the only to receive a citation in either the *Grove Dictionary of Music and Musicians* or the *Oxford History of Western Music* are:

**Berlin**

Siegfried Borris  
Harald Genzmer  
Konrad Noetel  
Franz Reizenstein  
Arnold A. Cooke  
Walter Leigh  
Heinrich Jacoby  
Bernhard Heiden  
Walter Kraft  
Ernst Pepping

**Yale**

Howard Boatwright  
Walter S. Collins  
Antonio de Almeida  
Martin Boykan  
Alvin Etlar  
Frank Smith  
Easley Blackwood  
Yehudi Wyner  
Harold Blumenfeld  
Jon Thorarinsson

Without wishing to enter into the larger and more evasive debate of whether Harvard was a better university than Yale, and despite the small pool of data, these lists show that Hindemith had considerably fewer prominent students than Piston and Messiaen. Hindemith's class produced competent music theorists, however, such as Boatwright and Kraehenbuehl. However, while these students may have implicitly advocated the *Unterweisung*, they did not publish effectively. Kraehenbuehl, founding editor of the *Journal of Music Theory*, was in an influential position to push through articles on Hindemith. He did not, however, attempt to comment or build upon *Unterweisung* theory. Boatwright compiled a new work on music theory which built upon Series 1 and 2, by creating a new Series 3; however, only unpublished fragments in the Yale Hindemith Collection are extant.

Hindemith needed his students to revise and engage with the *Unterweisung* to ensure its longevity. By contrast, the student-teacher dialectic is found in the publications (and reworking) of Schenkerian theory in the English language, Schoenberg's textbooks *Fundamentals of Musical Composition* and *Structural Functions of Harmony* with Leonard Stein, and in the revisions made by

Mark DeVoto to Piston's *Harmony*, which continues to enjoy a wide audience today.<sup>350</sup> One of Piston's Harvard students, DeVoto made such extensive revisions and additions between the third and fourth versions of Piston's *Harmony* that the textbook may be considered a jointly-authored work from that moment onwards. The differences between the 1948 third edition of *Harmony* and the 1978 fourth edition include 235 extra pages and a new section entitled 'after common practice'.<sup>351</sup> It is furthermore telling that DeVoto's new section on twentieth-century harmony contains no examples of Hindemith's music, despite detailed references to Ives, Stravinsky, Schoenberg and Bartók. Moreover, Hindemith is not mentioned in the use of pentatonic scales in the twentieth century, despite the importance of the 5-35 quartal collection in his music.<sup>352</sup> A further reason for the success of Piston's theoretical output is the clear division between textbooks on counterpoint, on orchestration, and on harmony. It is also much harder to revise a speculative treatise, compared with one that is more practical and observational.

Causing further damage to Hindemith's reputation as an innovator, Thompson (1980) accuses Hindemith of borrowing the concept of the 'secondary dominant' from Piston, in a text which otherwise pays him little attention:

The absorption of the secondary-dominant concept is evident as early as 1943, in Paul Hindemith's *Traditional Harmony*. Hindemith, who was teaching at Yale University at the time, appears to be the first theorist to borrow this idea from Piston.<sup>353</sup>

Thompson also implicitly dismisses the *Unterweisung*:

The philosophy of observation which Piston had proclaimed has largely been followed by subsequent writers. The value of an acoustical basis of a presentation of theory has considerably diminished since 1941.<sup>354</sup>

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<sup>350</sup> The inside-cover to the fourth edition of Piston's *Harmony* states that it 'is the most widely used textbook in its field today'. The preface to the revised edition also begins, 'In the thirty-seven years since its first publication, Walter Piston's *Harmony* has become and remained the most widely-used harmony text in America'.

<sup>351</sup> Third edition of *Harmony* (1948) has 340 pages, whereas the fourth edition (1978) has 575 pages (excluding indexes).

<sup>352</sup> Piston, Walter, *Harmony* fourth edition (London: Gollancz, 1978) pp. 480-82.

<sup>353</sup> Thompson, David M., *A History of Harmonic Theory in the United States* (The Kent State University Press, 1980) p. 146.

<sup>354</sup> *Ibid.*, p. 151.

A further case study for the Harvard reception of Hindemith may be found in a musical parody by Edward Ballantine (1886-1971). A Harvard faculty lecturer in composition from 1912-1947, Ballantine taught Piston in advanced harmony. His decision to write a pastiche of Hindemith's style is in one sense an accolade: the first book of variations (1924) included witty imitations of composers from Mozart and Beethoven to Debussy and Liszt, while the second book (1943), where Hindemith was to be published, included more recent composers such as Stravinsky and Gershwin.

The witty performance directions (including a variation entitled 'Fugato der Wunderkinder) are reminiscent of Hindemith's pluralistic early music, and Ballantine's choice of pitch in the opening theme is close to Hindemith's *Unterweisung* style. The opening chord, arranged in salient fourths and fifths, comprises the incomplete quartal collection 4-26. The two hands move in contrary motion, in a similar way to Hindemith's *Viola Sonata* (1939, example 8.13).

Hindemith was far from pleased by Ballantine's witty composition. Ballantine had written to Hindemith to ask for his permission to publish this variation. The answer he received was a blunt refusal, which could only have fostered the attitude among the Harvard elite that Hindemith was conservative and old-fashioned:

...as the sending of the piece could have only the purpose to know my opinion, I can simply and frankly assure you that I don't like it at all.<sup>355</sup>

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<sup>355</sup> Unpublished letter from Hindemith to Ballantine, dated 15 November 1941. Held in the Thomas Hall Collection, within the Yale Hindemith Collection.

**Andante**

\* Tie this middle C (note of healthy normality) from r.h. to l.h.

Example 8.16: Ballantine, unpublished theme from ‘Mary Had a Little Lamb’ variations, in the style of Hindemith.

## 8.4 The Theoretical Legacy

The *Unterweisung* needed to be a living theoretical work: to be altered, adapted, and disseminated by his students. However, due to fashion, coincidence, and (perhaps) Hindemith’s personality, this did not happen. The *Unterweisung* need not have been a dead end, however. It has impacted in some areas of modern musical thought, particularly in the United States, although it is telling that this section is comparably brief. The published work most indebted to *Unterweisung* theory, by some distance, is Persichetti’s *Twentieth-Century Harmony*. There are also relevant student essays and unpublished texts by Boatwright, and Lerdahl (1983 & 2001) is partially indebted to *Unterweisung* concepts.

Many of Hindemith’s Yale students wrote essays that engaged with the theoretical issues in the *Unterweisung*. Some of these have survived in the Yale Hindemith Collection, such as Harold Blumenfeld, ‘A Hypothetical System of Theory which includes the Seventh Overtone as a part of its basic Melodic and Harmonic Units’ (1948) and Kraehenbuehl, ‘Tonal Systems involving the

Seventh Overtone' (1948).<sup>356</sup> These brief assignments were inappropriate for publication, although they provide insights into the direction *Unterweisung* theory could have taken. Both discuss the use of the seventh overtone in music theory, which is likely to have been requested by Hindemith as teacher. Blumenfeld attempts to prove, using firstly melodic and then harmonic criteria, that the seventh overtone is unusable for theory building. This is therefore intended as an extended proof of Hindemith's decision to omit the seventh overtone in his derivation of Series 1. Kraehenbuhl writes that the temperaments produced from his scale building are to be emulated in performance. This issue is unclear in the *Unterweisung*. The production of a newly tempered chromatic scale is furthered by an additional investigation into its appropriateness for modulation. This is relevant to *Unterweisung* theory, and it is unfortunate for Hindemith's legacy that Kraehenbuehl did not publish his work.

Boatwright began his relationship with Hindemith as one of the few students to major in both composition and theory, before becoming an assistant professor of theory in the Yale faculty. Perhaps more than anyone else, he sought to expand on *Unterweisung* theory, and we may compare the relationship between Boatwright and Hindemith to DeVoto and Piston. There are two key texts in the Yale Hindemith Collection concerning Boatwright's *Unterweisung* developments: a memoire dated January 1959 regarding Hindemith's theory, and the plans for a book entitled 'Hindemith's Series: a Critical Evaluation, and a New Formulation'.

Boatwright finds that Hindemith's Series outlines the 'fundamental situations' whereby Series 1 describes melody and Series 2 describes harmony. To this, however, he planned to add a third: tonality, through memory. This is similar to both Schenker's concept of prolongation and Hindemith's own concept of Tonalität from the *Unterweisung* graphic analyses. A fourth species was planned, which 'combines the other [three] into a series of harmonic values stability of root

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<sup>356</sup> Yale Hindemith Collection Box 24, Folder 369, donated by Carl Miller.

and pure consonance'.<sup>357</sup> The treatise therefore sought to build on the speculative content of the *Unterweisung*, distancing it from a mere description of Hindemith's style.

Boatwright critically engaged with Hindemith's work. He found that Series 1 inadequately showed the melodic aspect of music, and that the position of the major sixth should be moved in Series 2 (he does not expand on his reasons for this). He also felt that Hindemith needed to extend his principals of interval inversion to ninth chords.

His 1959 memoire summarises his opinions about the *Unterweisung*. At the time of writing, he believed that interest in Hindemith's theories had subsided, because of only the publication of *Exercises in Two-Part Writing*. He writes:

The reaction of even the best-intentioned theory teacher was, 'so far, so good, but how can I take the eager student onward from these little exercises to something that will come closer to fulfilling his ambition to write contemporary music?' The jump, which Hindemith so deplored, between the theory class and composition was almost as great after his 2-part writing as after the typical sixteenth-century counterpoint course, that for Hindemith such a problem was there because he knew exactly how to lead his own pupils straight from the 2-part exercises to composition in a well-regulated contemporary style like his own. But for other teachers to have made successful use of his work, the 3-part writing and other material was absolutely necessary, and this should have been accessible by 1945, at the latest for his theoretical ideas to have had a just trial on the present-day musical scene.

The third volume of the *Unterweisung*, on three-part writing, was not published until 1970, after Hindemith had died in 1963. It remains available only in German, and is not a true representation of Hindemith's work. There are English translations from the 1940s of the drafts for this volume, made by various Yale students, although these have never been collected for publication.

Boatwright's work would have begun a dialogue with the *Unterweisung* that could well have kindled interest in extended tonal theory founded on acoustics. His plan for a textbook both

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<sup>357</sup> Boatwright, 'Hindemith's Series: a Critical Evaluation, and a New Formulation' (1959) p. 2.

engages with, and builds upon Hindemith's work. However, his work remains unfinished and unpublished.

Hindemith was not the first to use overtones to justify, and generate, a theory of music in relation to the chromatic scale. Arnold Schoenberg published on this possibility in his *Harmonielehre* (1911), stating:

a triad [...] d-g-c, or c-g-d, [...] surely has natural justification; for c (the root) has as its first overtone g, whose first overtone is, in turn, d [...] I believe an exploration [of quartal harmony], filling out the tertian system more or less temporarily, ought to open up certain new prospects for the theorist.<sup>358</sup>

This is taken from his chapter 'Chords Constructed in Fourths', which both defines quartal pitch collections for the first time, and shows the potential for a link with the overtone series. This is precisely the basis of Hindemith's *Unterweisung*. Crucially however, Schoenberg did not decide to pursue this idea as a theory of music.

After Schoenberg's *Harmonielehre*, Persichetti was one of the first theorists to clarify the concept of quartal harmony, in his 1961 textbook, *Twentieth-Century Harmony*.<sup>359</sup> Written while Hindemith was still alive, it is indebted to many of Hindemith's original theoretical concepts, and is similarly divided into a theoretical part and practical part. His treatise includes one of the first attempts to describe and define quartal harmony, in addition to devoting a chapter to 'key centres'; a chapter on harmonic direction that is indebted to Hindemith's harmonic fluctuation and chord roots; and a chapter, 'Embellishment and Transformation', which is built upon Hindemith's theory of melody. His chapter, 'Chords by Fourths', uses the term quartal to describe twentieth-century harmony. Without reference to pitch classes, Persichetti outlines quartal tetrachords, and observes that adding another fourth creates the pentatonic scale.<sup>360</sup> Persichetti indirectly agrees with Hindemith's chord group AV when he states that 'chords by perfect fourths, are ambiguous

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<sup>358</sup> Schoenberg, Arnold, *Theory of Harmony* (Berkeley: University of California Press, 1911, trans. 1978) p. 399.

<sup>359</sup> Ibid., chapter XXI, 'Chords Constructed in Fourths' pp. 399-410.

<sup>360</sup> Persichetti, Vincent, *Twentieth-Century Harmony: creative aspects and practice* (New York: W. W. Norton & Co., 1961) p. 94.

in that, like all chords built by equidistant intervals (diminished seventh chords or augmented triads), any member can function as the root'.<sup>361</sup> Like Hindemith's chord groups, he only applies this to a single arrangement of a quartal chord, where every pitch is a fourth apart. To this he then shows how voice leading can imply a root:

**Moderato**  
**Ob. Cl. Bn.**

Example 8.17: Ex. 4-4 from Persichetti's *Twentieth-Century Harmony*, p. 94.

As with Hindemith, Persichetti differs from set theory, which would also consider other chords as belonging to the same group, as a result of octave equivalence.

Persichetti implicitly refers to procedures that were used in Hindemith's *Marienleben* revisions. These include pedal points and quartal sequences, which are set as exercises at the end of the chapter on 'Chords by Fourths':

1. Write sequential passages for flute, oboe and clarinet. Use chords by perfect fourths exclusively.
- ...
3. Write an example of three-part quartal harmony for two violins and viola over a cello pedal point. Ornament the pedal.<sup>362</sup>

Hindemith's *Marienleben* foreword (1948) includes a diagram for expressive and dynamic climaxes, which is strongly similar to Persichetti's illustration of melodic and harmonic tension. His calculation of chord roots is also identical to Hindemith's Series 2, and the term 'tonal mass' is found in the *Craft* (1942, p. 56), regarding Series 1.

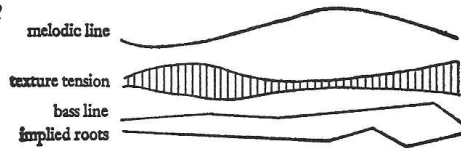
<sup>361</sup> Ibid., p. 94.

<sup>362</sup> Ibid., p. 106. He also writes that a pedal point 'lessens any dissonant tone's need for resolution', p. 98.

Ex. 9-1

Melodic and harmonic lines of tension may be placed in variable relationships with the root movement.

Ex. 9-2



Although register placement of the entire tonal mass does affect the direction of sound,

Ex. 9-3

Example 8.18: Examples from Persichetti, *Twentieth-Century Harmony* (1961) p. 183.

Persichetti treats Hindemith's music as his main source of reference, alongside Stravinsky, Bartók and Honegger.<sup>363</sup> It is further notable that he includes music by Benzton and Heiden. At the end of his chapter on quartal harmony, Persichetti provides a list of source material – this is revealing not only because it contains a work by Hindemith, the *Nobilissima Visione* Suite, but that it also contains music by Webern, Schoenberg and Berg, amongst others. He also combines this source material with examples of his own composition; it is therefore not wholly observational by comparison with Piston and Schoenberg.

<sup>363</sup> These composers receive the most citations in the treatise, including Stravinsky (23), Bartók (21), Hindemith (20) and Honegger (19).

Despite these clear references to Hindemith's music and *Unterweisung* style, and the regular use of Hindemith's music for examples, nowhere does Persichetti acknowledge Hindemith the theorist. Like Hindemith, he does not regularly reference other works of music theory in his writing. Perhaps, Persichetti felt the need to keep the *Unterweisung* at arm's length during the 1960s, despite its important connections to his own work. The success of his work may also be related to the publisher Norton, the same company that owns Piston's *Harmony, Counterpoint, and Orchestration*.

Persichetti's treatise is more modest in scope than the *Unterweisung*, and has been written far more with the student reader in mind. In this sense, it may be understood to have developed *Unterweisung* theory by making it more widely intelligible. Persichetti also tries, briefly, to tackle the theoretical problems of rhythm and metre. His textbook is not without flaw, however, most notably the description of the 'undertone' series, which Persichetti had presumably taken from the treatises of Riemann and Vincent D'Indy.<sup>364</sup>

Similar to Persichetti, Luigi Nono did not mention the *Unterweisung* in publication. However, in Guerrero's ground-breaking article (2009), his sketches are published for the first time, which refer to the *Unterweisung*. The article places Nono's sketchbooks into two categories: those that apply *Unterweisung* theory and those that attempt to further it. The first category includes an application of harmonic fluctuation and chord analysis to dodecaphonic music, which, while convincing, is likely to have been an area that Hindemith would have frowned upon given his dislike of serial music.<sup>365</sup>

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<sup>364</sup> See Rehding, Alexander, *Hugo Riemann and the Birth of Modern Musical Thought* (Cambridge: Cambridge University Press, 2003) for a critique of the undertone series.

<sup>365</sup> Hindemith's distain towards serialism creates a small amount of tension with his own work. The *Ludus*, for example, contains many of the processes one would normally associate with serialism, and his *Tuba Sonata* contains a twelve note row. A disregard for tonality is at the root of Hindemith's complaint against serialism, and yet many dodecaphonic pieces have tonal references, such as Berg's Violin Concerto.

Nono was a major figure associated with the Italian avant garde of the 1960s, which sat uncomfortably with Hindemith's work. Perhaps as a consequence of the anti-Hindemith environment that permeated new music in Darmstadt in the 1960s, Nono chose not to acknowledge in public his work on the *Unterweisung*. The following is an extract from the *Hindemith Forum*, providing an indication of how ground-breaking this discovery has been:

The essay by the American musicologist Jeannie Ma. Guerrero appears like a bolt from the blue. The result of her archival studies, it presents Luigi Nono's utterly surprising confrontation with Hindemith's theoretical ideas as explained in *Unterweisung im Tonsatz I*. Nono's diversity, according to the author, is not least the result of his intensive preoccupation with Hindemith's principal theoretical reflections.<sup>366</sup>

Nono's extensions to Hindemith's theories included the building of melodic and harmonic 'wheels' which contained pitch classes similar to Series 1 and 2. To this he also added the interval of a ninth, which coincides with the revised *Unterweisung* theory in Boatwright's unpublished treatise.

The *Unterweisung* has been unjustly marginalised in *The Cambridge History of Western Music Theory* (2002). This is most prominent in Lee Rothfarb's chapter on 'energetic' music theory, which describes the 'music-theoretical literature focused on music's dynamic qualities', with a focus on the early-twentieth-century work by Schenker, August Halm and Ernst Kurth. While Hindemith is mentioned only briefly in this study, his concepts of chord value, harmonic fluctuation and Tonalität represent energistic thought. For example, the *Marienleben* foreword (1948) provides a valuable document of how this area of music theory is not only applicable to the practical process of composition, but how it can be used to revise existing music.

The psychological study of energetics is pioneered by Lerdahl & Jackendoff (1983), who cite Hindemith's manipulation of overtones: as a theory that they will *not* be pursuing. However,

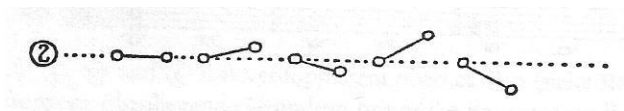
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<sup>366</sup> Winkler, Heinz-Jürgen, *Hindemith Forum* Vol. 25 (Mainz: Schott & Co., 2012) pp. 15-16. He refers to a version of Guerrero's work published in *HJb* 2011 entitled, 'The Presence of Hindemith in Nono's Sketches: A New Context for Nono's Music'.

there are important similarities.<sup>367</sup> Lerdahl & Jackendoff's prolongational trees represent tension and relaxation, which parallel Hindemith's graphs for harmonic fluctuation. These trees have been developed in articles by Lerdahl (1996), (1999), and (2007).<sup>368</sup> *Tonal Pitch Space* (2001) acknowledges further conformities between his systems of tonal pitch space and the *Unterweisung*, including virtual pitches and melodic attraction.<sup>369</sup> One may draw additional parallels with the work of Carol Krumhansl in *Cognitive Functions of Musical Pitch* (1990). This includes an engagement with the hierarchies of the diatonic system – which shares an atemporal hierarchy with the diatonic scale, whereby each note has a relationship to an initial tone by varying degrees.<sup>370</sup> Krumhansl's general definition of a tonic parallels Hindemith's concept of 'pitch centre' closely:

A tonal context designates one particular tone as most central. The other tones all have functions specified with respect to this tone, in terms of their relatedness to the tonic and secondary reference points established by the tonic.<sup>371</sup>

Two prominent parallelisms remain. Hindemith attempts to refine and express his melodic analysis in *Unterweisung III*, using small signs to represent voice leading:



Example 8.19: *Unterweisung III* (1970) p. 26.

These have a strong similarity with Charles Adams' classification of melodic contours in the field of ethnomusicology, published six years later.<sup>372</sup>

<sup>367</sup> The relationship between Hindemith and Lerdahl & Jackendoff is also cited in Taylor (1983).

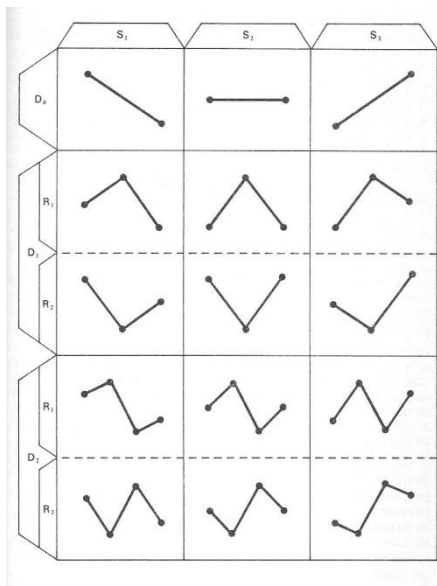
<sup>368</sup> Lerdahl, Fred, 'Calculating Tonal Tension' *Music Perception* Vol. 13, No. 3 (1996) pp. 319-363.

<sup>369</sup> Lerdahl, Fred, *Tonal Pitch Space* (New York: Oxford University Press, 2001) pp. 80-81 (virtual pitches), pp. 166-7 (melodic attraction) and pp. 348-9 (harmonic tension).

<sup>370</sup> Krumhansl, Carol L., *Cognitive Foundations of Musical Pitch* (New York: Oxford University Press, 1990).

<sup>371</sup> *Ibid.*, p. 18.

<sup>372</sup> Adams, Charles, 'Melodic Contour Typology' *Ethnomusicology* Vol. 20, No. 2 (May, 1976) pp. 179-225.



Example 8.20: Adams' melodic contours, taken from Cook, Nicholas, *A Guide to Musical Analysis* (London: J. M. Dent & Sons, 1987) p. 197.

Hindemith is reported to have referred to these signs as 'bones'.<sup>373</sup> The analogy is clear: lines connected by circular joints, to represent melodic shape. While perhaps a superficial comparison, it adds another way in which Hindemith preceded theoretical thought in the late twentieth century.

The final parallelism is the anti-historical approach of Hindemith's graphic analyses; his method was intended to be applicable to music from all genres and periods. This is identical to the approach taken by Wallace Berry (1976), who analyses music from plainchant to the present day, which by 1976, included works by Nono, Boulez, Carter and Berio.<sup>374</sup> The aspiration towards a universal theory of music continues today, such as Tymoczko (2011).<sup>375</sup> There is a sense that, while Hindemith became out-dated, many of his intuitions have proven to be relevant to music theory, particularly in the field of energetics. In particular, his pioneering use of combination

<sup>373</sup> Joseph Dunlap, in an unpublished letter to Luther Noss dated 7 October 1973, writes: 'notice the little gadgets on p. 17 [of *Unterweisung III*]. Paul Hindemith refers to them as "bones"'.  
<sup>374</sup> Berry, Wallace, *Structural Functions in Music* (New Jersey: Prentice Hall, 1976).  
<sup>375</sup> Tymoczko, Dmitri, *A Geometry of Music* (New York: Oxford University Press, 2011).

tones to derive Series 2 preceded the identification of virtual pitch theory, despite being built upon the same premise.<sup>376</sup>

## 8.5 Conclusions

The Hindemith legacy is dominated by unfortunate coincidences and missed opportunities. His public was not able to successfully reconcile his portfolio of practical music making, composition, teaching and speculative theory building activity. Theorists and composers have been unsure where to place him. His diverse professional activities, which would have appeared to be a great virtue at the time, have disrupted the memory of his work. Hindemith was a predominately practical musician, and it may be understood as divertive that he should have spent so much time on the problems of music theory.

Hindemith enjoyed the dialogue with students and colleagues, such as Sala and Roth, on his early drafts for the *Unterweisung*. However, after his immigration, he needed input, and acceptance, from the North American theoretical community to progress further. An ideal time to have advanced Hindemith's musical and theoretical legacy would have been in 1964. A prominent Hindemith commemoration event was organised to this effect, on 7 and 8 November which included an exhibit of correspondences, autographs, personal memorabilia and concert programmes. The Yale Hindemith Collection, which was inaugurated during this event, now holds the unpublished theory work, such as Boatwright's plan for a new theory textbook. However, this collection has not been exhaustively studied for its theoretical discourse. The posthumous publication of *Unterweisung III* (1970) by Briner, Meier and Rubeli has confused *Unterweisung* study, as it represented Hindemith's unfinished work on three-part writing. The timing was wrong: Boatwright felt that this volume needed to have been released by 1945 to have made a lasting impact upon music theory. It is telling that it has not been translated into English.

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<sup>376</sup> Lerdahl, Fred, *Tonal Pitch Space* (New York: Oxford University Press, 2001) pp. 80-81.

Hindemith needed a staunch pupil-defender of his theory work, such as Reizenstein or Boatwright, to collaborate with him on revisions. This could have created a rich discourse to ultimately improve and further his work, in a similar way to DeVoto's revisions on Piston's *Harmony*. His uncompromising attitude towards his students may have resulted, short-term, in their compositions sounding like his own; but in the longer-term, he bred resentment from the very people that he needed to advocate his legacy. Serialism and experimental music offered a more immediate compositional strategy compared with Hindemith's insistence upon a chromatic and (implicitly) quartal approach to species counterpoint. This is not helped by the lack of clarity in Hindemith's own writing on the relationship between his music theory and compositional practice. Hindemith's emphasis on counterpoint, contrary motion, an obligation to Bach and baroque genres, and quartal pitch collections, was far removed from the Darmstadt avant-garde.

The following quotation has survived from John Cowell, a composition-theory major under Hindemith at Yale (BM 47, MM 48), which confirms Hindemith's reputation among his students:

Hindemith's nature was too crustily Germanic for the American students and leaving composers and opinion makers of the late '40s, and for many who survive to this day. He expressed himself in dangerously haughty and superior ways, to his great detriment. The most damaging exposure leading to the destruction of good will towards himself as a teacher and theorist was the Summer of 1940 when Hindemith was on the faculty of the Boston Philharmonic's Tanglewood School and Festival in the western Massachusetts Berkshires [...] Hindemith openly expressed his shock at the poor training of the young composition students assigned to his class. [...] Hindemith brought everyone down to his beginning level in "two part writing" and there was both resentment and scorn. One promising composition student in his class was found dead in a lake and there was a presumption of suicide. The opinion was against Hindemith in that case compounded by the rigid regime of his classes. I believe that at least partly because of such things, he fell farther than is reasonable.<sup>377</sup>

Many of Hindemith's ideas came close to popular theoretical trends today, and may still be found to have potential. For example, his *Marienleben II* (1948) foreword introduced concepts of expressive and dynamic structural levels. Even Schenker did not publish on these, although he did entertain the idea of dynamic structural levels within his sketches.<sup>378</sup> The *Unterweisung* is also

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<sup>377</sup> Lee, Dong-Seon, 'A Structural Analysis and Performance Guideline of "Ludus Tonalis" by Paul Hindemith' (University of Washington, DMA, 1994) p. 13.

<sup>378</sup> Schenker, Heinrich, *The Art of Performance* (New York: Oxford University Press, 2000) p. xv.

closely connected to energetic music theory, and with the exception of Boatwright's unpublished work, Persichetti's *Harmony* comes closest to developing it. That Persichetti's treatise is not referenced once in the *Cambridge History of Western Music Theory* (2002) goes some way to prove how unfashionable this way of thinking has become.

By far Hindemith's most popular textbook has been *Elementary Training for Musicians*, which, given its emphasis on rigorous aural training, was without serious competition for much of the twentieth century. It was also built on an understanding which is undeniable: Hindemith possessed uncanny aural ability, and demanded similarly high levels from his students. Whether one has a taste for his musical style, Hindemith's command of musical technique has been largely unquestioned. For this reason, it would have perhaps been advantageous for Hindemith to have written a textbook on orchestration, another of his widely-regarded strengths.<sup>379</sup> Salzman wrote in the *New York Times* (1959) that 'Hindemith has written a sonata for virtually every instrument in the orchestra, and it is said that he can blow or bow at least a scale on most of them.'<sup>380</sup> This attitude to instrumental mastery was also reported within the Yale Collegium Musicum. Hindemith 'arranged the music, taught it to the students, taught the old instruments, played himself, brought the music alive as only a Medieval-Renaissance master can'.<sup>381</sup>

The *Journal of Musicology* has emerged as the new international forum for Hindemith research, replacing the *Music Review*. It engages much more productively with his work, rather than the one-sided tide of polemics from 1954-65, and includes Guerrero's article on Luigi Nono (2009), and work by Hany (2009) and Trippett (2007). This is augmented by the publications of the

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<sup>379</sup> It has become an urban legend that Hindemith could play every instrument of the orchestra, and that he similarly taught every instrument as part of his Berlin orchestration class. Alan Bush (1969) recalls Franz Reizenstein referring to the ensemble formed in Berlin through this practice as the 'Brigands' Band'.

<sup>380</sup> Salzman, Eric, 'Paul Hindemith, Master of Many Trades' *New York Times* (Feb 15, 1959) p. x9.

<sup>381</sup> Foss, Lukas, 'In Memoriam: Paul Hindemith (1895-1963)' *Perspectives of New Music* Vol. 2 No. 2 (Spring-Summer, 1964) p. 3.

Hindemith Institute, Frankfurt-am-Main, such as the *Hindemith Jahrbuch*, *Hindemith Forum*, and the growing *Sämtliche Werke*, all published by Schott & Co.

The defence of Hindemith's legacy has been ineffective for three reasons: firstly, some students, who owed a strong debt to Hindemith's music and teaching (of which Genzmer is a prime example), did not come forward to defend Hindemith in the 1960s following his death. Secondly, those students who felt strongly inclined to do so, such as Reizenstein, did not do so effectively, as a consequence of using publishing locations of secondary significance. Thirdly, new critiques and advances in music theory, such as Boatwright's new 'Series' and Nono's sketchbooks, were not even published.

However, despite the problematic issues surrounding the reception of Hindemith's *Unterweisung*, his music is still performed throughout the world. In particular, his instrumental sonatas, *Mathis der Maler* and *Symphonic Metamorphosis* remain core repertoire. While this represents a small proportion of his published work, Hindemith succeeded in creating a distinctive musical style, refined and systematised by a unique theory of composition, which worked with, rather than against, tonality.<sup>382</sup> This is his legacy.

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<sup>382</sup> See also Taruskin, Richard, *The Danger of Music and Other Anti-Utopian Essays* (Berkeley, University of California Press, 2009) p. 60, where he quotes: "You know, I've written a lot of music", Paul Hindemith once remarked to the American composer Otto Luening. "Yes, you certainly have," Mr. Luening agreed. "And you know," Hindemith continued, "80 percent of it is bad." "Then why did you write it?" Mr. Luening asked, with Hindemithian tact. "Because without the 80 percent," came the reply, "there would never have been the 20 percent."

## Chapter 9: Conclusion

### 9.1 Summary

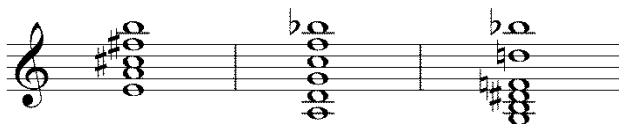
An analysis of *Unterweisung* principles within Hindemith's music shows that his music written from his Berlin appointment (1927) onwards tended towards a greater conservatism, such as the use of fewer and more standardised performance and expression markings, contained more regular and explicit quartal pitch collections, and was constructed with clearer compositional strategies and pre-conceived formal structures. This may be observed in both a comparison of his eclectic earlier style and post-1927 compositions, and in the revisions to his music written before, and yet revised after, the *Unterweisung*.

Such techniques are not wholly absent from Hindemith's early music, however. Even in his most dissonant and anti-structuralistic works, such as the *Solo for Viola Sonata* op. 25/1, Hindemith shows a concern for voice leading. There are also explicit quartal pitch collections to be found, although they feature less prominently than in his post-theory works. Hindemith's early music, while highly abstract, liberal and instinctive, still contained traces of thought that could become the subject of theory. One could therefore suggest that his early style lent itself well to theoretical refinement.

One area of this early style that was to be completely jettisoned after the *Unterweisung* was the octatonic scale. Hindemith's use of this scale has not been fully investigated. This is surprising, given the interest generated by this scale in relation to the music of composers such as Stravinsky and Bartók. Unlike Stravinsky, however, Hindemith does not draw upon a national heritage for the modes of his composition; rather, the presence of the octatonic scale in his early music is but one facet of his pluralistic borrowings.

Hindemith's emphasis on quartal pitch collections relates to prolongational characteristics that are neither tonal nor atonal, and which defy conventional categorisation. These prolongations are also implicitly referred to in the *Unterweisung*, particularly within the graphic analyses. Furthermore, Hindemith's quartal pitch collections, which are fully invertible, allowed him to perform the myriad of contrapuntal operations in the *Ludus Tonalis*. This may also be related to his growing fondness for writing musical canons from the 1940s onwards; he wrote only one canon before the *Unterweisung*. However, the transparency of procedures that exploit quartal collections (every pitch in a quartal collection may coincide with any other, which is why many jazz musicians start improvisation training with the pentatonic scale) has discouraged many mainstream composers of the late-twentieth and early twenty-first centuries from pursuing it. A further problem is the sense of harmonic stasis. While Hindemith describes modulation in the *Unterweisung*, in reality, it is not a significant concept in quartal pitch space, particularly in comparison with tonal music.

Strangely, the capacity for inversion inherent in all quartal collections is implicitly refuted in the *Unterweisung*. The following example includes quartal pitch collections, which would place it within Hindemith's chord category V (indeterminate). This is contradicted when Hindemith describes them as losing all sense of identification if inverted:



Ex. 9.1: Chords 'incapable of inversion' taken from the *Craft* (1942) p. 91, also used in example 2.14.

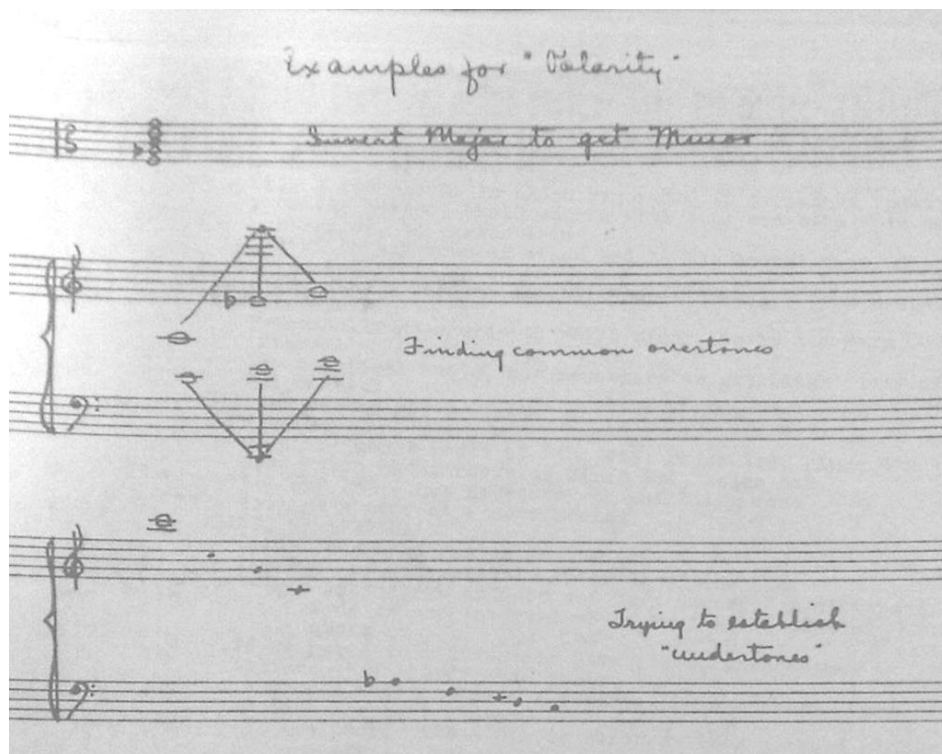
This is not consistent with Hindemith's compositional practice in the *Ludus*, a work full of inversions and retrogrades, which is perhaps his most theory-based composition. Such contradictions surely harm Hindemith's theory – how seriously is the student to take a remark that is rejected in practice?

As discussed in the previous chapter, Hindemith added to his problems by pushing his students towards his own manner. This bred resentment in some cases, and hindered the dissemination of, and improvement to, his theories. He needed a clearer agenda in his teaching: to either help students with practical, technical and compositional issues (like Piston) or to provide the explicit instruction of his personal style (like Messiaen). Hindemith also had a peculiarly unfortunate reception in *The Music Review*, which may be traced to the personal agenda and training of each author. Hindemith did not do himself many favours in this regard, although he was also very unfortunate.

Schoenberg's decision not to pursue the psychoacoustic basis for music-theory construction appears, in hindsight, to have been wise. While serialism, just as quartal harmony, has become outmoded, it enjoyed a far greater heyday. Also successful was Schoenberg's separation between the teaching of practical technique and serialism, which, while disappointing some students who travelled to learn with him in California, fostered more faithful students.

## **9.2 Areas for Future Research**

There was not space in this thesis to explore every aspect of Hindemith's music and music theory. For example, there are many archival documents waiting to be investigated, particularly concerning Hindemith's connection to the Third Reich in the archives of the Berlin University of the Arts (Universität der Künste). That these events unfolded during the writing of Hindemith's music theory deserves a separate study. The general relationship of Hindemith's theory to German pedagogy will tell another story, particularly in relation to Hugo Riemann: Hindemith discusses the undertone series in Yale music theory classes from the 1940s. This may be found in the notes of Myriam Fox Withrow (1947-8):



Example 9. 2: Myriam Fox Withrow's class notes from 1947-1948 showing Hindemith's explanation of the undertone series.

Hindemith does not explicitly mention undertones in any of his published writings, despite their superficial similarities to difference tones.<sup>383</sup> It may also be more than a coincidence that D'Indy's substantial and comprehensive *Cours de Composition Musicale* (Paris, 1902) was translated from French into English in 1946. This highly regarded text – studied by Messiaen and Heitor Villa-Lobos – includes reference to *Résonance Supérieure* (overtones) and *Résonance Inférieure* (undertones). Hindemith's 1944 article, 'Methods of Music Theory', also indicates knowledge of the dualist thinker, Arthur von Oettingen.<sup>384</sup> While Hindemith does not refer to undertones specifically in this text, it is likely that he was referring to dualism when he states that, 'the [psychoacoustic] method strayed into bypaths (Riemann, Oettingen), and was misunderstood, misinterpreted, and misused.'<sup>385</sup> There is no indication in Withrow's class notes, however, whether Hindemith believed in the scientific accuracy of harmonic dualism; although given his

<sup>383</sup> Hans Peter Reinecke (1962) suggests that Riemann may have mistakenly described combination tones as undertones. See Rehdig, Alexander, *Hugo Riemann and the Birth of Modern Musical Thought* (Cambridge: Cambridge University Press, 2003) pp. 16-17.

<sup>384</sup> Hindemith, Paul, trans. Mendel, Arthur, 'Methods of Music Theory' *The Musical Quarterly* Vol. 30, No. 1 (Jan., 1944) p. 23.

<sup>385</sup> *Ibid.*

own propensity for blending music theory and psychoacoustics, Hindemith would likely have explored any common ground. A close examination of other student class notes would help to further contextualise Hindemith's knowledge of theoretical systems and traditions.

There are further archival riddles. The difference tone record referred to in the Yale Hindemith Collection is, in all likelihood, lost. However, should it resurface, it would provide invaluable information on Hindemith's understanding and engagement with difference tones. This would provide a new context for his development of Series 2. For example, it might show how difference tones vary in intensity, which would explain Hindemith's development of chord roots and inversion, and his reasons for only choosing first- and second-order pitches.

The importance of the mature instrumental sonatas for the dissemination of Hindemith's music should not be underestimated. These 16 sonatas were written between 1935 and 1955, and include 15 different instruments, many of which have very small repertoire pools. They are strongly 'theoretical' pieces:

1935	Sonata for Violin and Piano
1936	Sonata for Flute and Piano
1938	Sonata for Bassoon and Piano
1938	Sonata for Oboe and Piano
1939	Sonata for Violin and Piano
1939	Sonata for Clarinet and Piano
1939	Sonata for Horn and Piano
1939	Sonata for Harp
1939	Sonata for Trumpet and Piano
1939	Sonata for Viola and Piano
1941	Sonata for English Horn and Piano
1941	Sonata for Trombone and Piano
1943	Sonata for Althorn (or Alto Saxophone) and Piano
1948	Sonata for Violoncello and Piano
1949	Sonata for Double Bass and Piano
1955	Sonata for Tuba and Piano

At the time of this thesis, Schott Music was not at liberty to share its sales figures of Hindemith's published works (this includes both his compositions and music theory). However, these could provide a rich source of information to add specificity to Hindemith's legacy. For example, they

could quantify the popularity of Hindemith's instrumental sonatas, and show whether his practical, rather than speculative *Elementary Training for Musicians* is his best-selling pedagogical textbook (I strongly suspect it is). This would prove the hypothesis that the damning reception of Hindemith's music and theory in notable musicological publications is at odds with the status of his music among performers. I believe that Hindemith's stock among practical musicians remains high.

Further information pertaining to the *Unterweisung* legacy may be found by studying new editions. It has been translated into many languages, including Japanese, Norwegian, Spanish, Czech and Romanian, which highlights the interest in his work outside of English-speaking sphere. Copies of these are held in the Frankfurt Hindemith Institute. Each new translation will have its own reception history, which could form the basis of an independent study; this thesis has been primarily concerned with the Hindemith reception in the UK, USA and (to a lesser extent) Germany.

Hindemith's interest in the building of scales continued after the *Unterweisung* in a text entitled, 'Equal Temperament: 6 to 53 tones to the octave' which was completed at an unknown time in Yale during the 1940s. It is unclear whether this was published, although photocopies are held in the Yale Hindemith Collection. Surprisingly, it is not mentioned in any published Hindemith bibliographies (such as Luttmann or Grove), despite containing a significantly more detailed engagement with scale temperament than *Unterweisung I*. Hindemith further alludes to the possibility that his musical system should influence temperament when writing of 'the numbing and corrupting poison of the piano keyboard' in *Introductory Remarks* (1948). This invites a scientific investigation into the practical applications of Hindemith's temperaments, which is yet to take place.

This thesis is a case study of a unique instance of theory and practice. The aims and methods have been specific to Hindemith's music. In particular, the introduction of incomplete quartal sets assists with the identification of areas that would not otherwise be described as relating to quartal pitch collections. However, they may well be adapted and applied to other composers, such as Schoenberg, Persichetti and Witold Lutoslawski. The theory of complete and incomplete quartal pitch collections may impact not only on the analysis of Hindemith's music, but those who also write with chords consisting primarily of fourths and fifths. This in turn may develop new compositional practices, such as those built upon quartal pitch cycles and sequences, rather than the diatonic circle of fifths.

### 9.3 Postlude

In many ways, Hindemith's attitude towards the building of a new theory of music anticipated current trends. Most recently, the ambition to create a theory that unifies arts and sciences parallels Dmitri Tymoczko's *Geometry of Music* (2011), which was briefly introduced in the previous chapter. While Tymoczko develops a different method, his aim is similar to Hindemith's as shown in the press release to Tymoczko's book, where it is described as a 'grand unified theory of music'.<sup>386</sup> Similar to Hindemith, Tymoczko attempts to draw together a theory that is applicable to all music, such as 'from before Palestrina to after Bill Evans'.<sup>387</sup> He describes an 'extended common practice', which is used to group together features existing in music from the beginning of counterpoint to the present day, in order to 'retell' the (tonal) History of Western Music. Voice-leading graphs and geometric patterns are used to simulate, represent and describe different samples of compositional practice, which owe a debt to the graphic analyses and representations by Schenker, Hindemith and Riemann. Hindemith investigated and applied overtones and difference tones to ally his music theory with natural science. Tymoczko's

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<sup>386</sup> Olson, Steve, 'A Grand Unified Theory of Music' *Princeton Alumni Weekly* (Feb 9, 2011) [<http://paw.princeton.edu/issues/2011/02/09/pages/6550/>] accessed 19 July 2013.

<sup>387</sup> Tymoczko, Dmitri, *A Geometry of Music* (New York: Oxford University Press, 2011) p. 5.

approach is also cross-disciplinary, although he applies concepts from geometry, rather than acoustics, to the extent that a related article was published in the journal *Science*.

While many examples of popular music and jazz referred to in Tymoczko's theory, such as works by The Beatles and Miles Davis, had not been written in Hindemith's day, it similarly reflects the hope that present-day composition can be understood as an inseparable element of the Western-Music tradition. This is the subtext to Hindemith's graphic analyses: beginning with plainchant and ending with his own *Matthis der Maler*, he attempted place, and justify, his own music – and compositional language – within the temporal context of Western Music. Each theory is constructed to advocate the aesthetic position of the author.

A further parallel exists, concerning the relationship of music theory to compositional practice.

In his conclusion, Tymoczko writes:

And while I had initially envisioned an entire chapter describing the potential compositional applications of these ideas, I eventually decided against this. For it seemed to me that readers might prefer to discover *for themselves* how to use these new concepts to create new music. And I thought that I myself might prefer to be surprised by what readers come up with, rather than pushing them to walk along the paths that I had already made.<sup>388</sup>

This shows a shying away from direct, practical implications. And yet, as with Hindemith's quartal *Unterweisung*, there is a stylistic bias to be found throughout its pages. For Tymoczko, jazz is of central importance. This is shown by his retelling of the History of Western Music, in part two of the book, to more fully incorporate and emphasise jazz, in both notated and non-notated forms.<sup>389</sup> That it leaves the issue of practical application vague and open, contradicts the tone of much of the theory, which steers the reader in an implicit, jazz-oriented stylistic direction.

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<sup>388</sup> Ibid., p. 393.

<sup>389</sup> The last sentence of Tymoczko (2011) p. 390, prior to the conclusion, is: 'One can only hope that the recent election of the first African-American president of the United States foreshadows a future, however distant, in which irrational barriers may mean less than they once did, and in which we can start to appreciate the profound connections between jazz and other musical styles.'

The critical reaction to speculative (rather than empirical) music theory, such as that encountered by Hindemith in *The Music Review*, continues. This is illustrated by the reception of Tymoczko's theory, where he has been forced to defend himself in an ongoing dialogue in the review section of the North American theory journal, *Music Theory Spectrum*.<sup>390</sup> However, the interest in music theory that links music and science has grown, as has the impulse to create it, although in areas such as cognition and geometry (such as neo-Riemannian theory), rather than Hindemith's psychoacoustics.

While a handful of recent composers are, or have been, published theorists (notable examples include Lerdahl and Babbitt), the disparity between composers with a theory, and composers without, remains strong. The two primary motivations for a composer to write a theory are: firstly to refine their own technique, both for their benefit and for the benefit of others; secondly, as an aid for teaching composition. Given the significant presence of composers within university music departments and the demand that this places upon publication, one may posit that the impulse – or pressure – to write a theory of music has never been higher. Indeed, for one to achieve a notable position within the North America field of music theory it is not enough to practice and teach existing methods; one must develop one for oneself. Outlets for this work include the Society for Music Theory (SMT), the periodicals *Music Theory Spectrum* and *Journal of Music Theory*, in addition to the current Oxford Studies in Music Theory series, edited by Richard Cohn. The *Unterweisung* may be read as a prototype for speculative North-American music theory.

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<sup>390</sup> Ibid. This book is reviewed by Headlam, Dave, "The Shape of Things to Come? Seeking the Manifold Attractions of Tonality: A Geometry of Music: Harmony and Counterpoint in the Extended Common Practice by Dmitri Tymoczko" *Music Theory Spectrum* Vol. 34, No. 1 (Spring, 2012) pp. 123-143. There are two responses printed in the same volume, the first by Tymoczko entitled, 'Hey, Wait a Minute!' pp. 144-49, and the second in response by Headlam entitled 'The Reviewer Responds, but not in Kind' p. 150.

While Hindemith's compositional style is currently out of fashion – not a single work is programmed in the 2013 BBC Promenade Concerts, despite his fiftieth anniversary – he deserves greater recognition as an historical precedent for popular theoretical ideas. For example, the Fux training for Schenkerian analysis, represented in Salzer & Schachter, *Counterpoint in Composition* (1969), which was not published until five years after Hindemith's death, is very similar to the *Unterweisung* reductive process of two-voice framework. There are further similarities between Schenker's linear progressions and Hindemith's melodic degree-progression, particularly regarding hierarchy and structural levels.

Developments in contemporary music composition are also suggesting a renewed interest in scale-building and harmonic fluctuation. Many innovations associated with the 1960s Avant-Garde have been exhausted, and composers are concerned in greater numbers with the old issues of consonance and dissonance. New scale constructions are common – in the music of Arvo Pärt and James MacMillan, for example – and while theory textbooks have yet to be written about them, the fact that they *could be* is most relevant. The concept of harmonic fluctuation is also very much alive, and while the previous chapter connected it to the theories of Lerdahl, it may be used to describe the majority of contemporary music making that involves 'ebb-and-flow' of tension. In reality, this could be applied to a vast number of recent compositions, particularly those by British composers, such as Oliver Knussen and John McCabe. Furthermore, quartal collections, while not used as uniformly as in much of Hindemith's music, are still in common practice for their motivic character, distinctiveness (such as use at climax points) and for the way in which they lend themselves to contrapuntal manipulation.

For example, quartal pitch collections feature prominently in the popular first song from Knussen's *Whitman Settings* for soprano and piano, op. 25 (1991), 'When I heard the Learn'd

Astronomer'. The opening soprano motif grows from bar 2, to include the 3-9 trichord [B E A] at bar 7. The motivic salience of this collection is emphasised by repetition in bar 10, and then by transposition in bar 11. Quartal collections are to be found throughout the piano accompaniment, particularly in note combinations that are sustained, such as bars 2, 4, 5, 7, 9, 10 and 11. The piano pedal markings enforce the notion that Knussen's quartal collections are to be heard as a pitch group: in bar 7, the pedal sustains all three pitches of the opening trichords [B E A] and in the final beat of bar 9, the pedal sustains the 5-35 pentachord [F# B E A D]. Following bar 11, Knussen explores other, non-quartal pitch collections before a notable statement in bars 29-33. This may be interpreted as the climax of the song, both in terms of temporal placement (approximately two thirds of the way through), dynamic level (mf – ff), textural density and pitch compass. These bars refer strongly to quartal collections, particularly the 3-9 trichord [B, E, A] in bars 29-30, which demonstrates that Knussen uses these pitches strategically. Thinking about intervals and pitch collection in these hierarchical terms is representative of Hindemith's *Unterweisung* approach.

♩ = 84c.

*f* (>)

*f*

poco rubato... When poco rubato... When

5

*f*

poco rubato... When I heard

*f*

*Red.*

8

*f*

When

*sf* *f* *mf*

*Red.*

10

I heard When I heard

*f* *mf* *f* *mf* *f*

*Red.* *mf* *sonore*

Example 9. 3: Knussen, *Whitman Settings* for soprano and piano, op. 25 (1991), 'When I heard the Learn'd Astronomer' bb. 1-11.

The fourth song from John McCabe's *Irish Songbook* Part 1 (1994), 'The Mother' similarly includes quartal pitch collections. It would lend itself well to Hindemith's harmonic fluctuation analysis: points of stability (such as the entry of the voice in bar 4, underpinned in the piano by the incomplete quartal tetrachord 4-8) are represented by explicit quartal collections, which contrast with more dissonant material, particularly in the piano part, in sections without emphasis (such as bar 3). This could also be described as a prolongational structure. Motifs are constructed with quartal collections, such as the piano accompaniment from bar 7. While McCabe's style is different to Knussen's in many ways, particularly concerning the level of detail in the score and rhythmic complexity, he, too uses quartal pitch collections strategically.

Maestoso e molto risoluto  $\text{♩} = 88$

*f*

3 *f con forza*

I do not grudge them: Lord, I do not

*mf*

6

grudge My two strong sons that I have

*mf*

*f*

8<sup>va</sup>

8<sup>vb</sup> con Ped.

8

seen go out

8<sup>va</sup>

8<sup>vb</sup>

8<sup>vb</sup>

8<sup>vb</sup>

9

To break their strength and die,

(8)

(8)

Example 9.4: John McCabe, *Irish Songbook*, Part 1, Song no. 4 'The Mother' (words by Padraic Pearce) opening 10 bars. Written in 1994, premiered Cambridge 5 May 1994.

We can learn many things from an examination of the relationship between Hindemith's music theory and compositional practice. Most importantly, it shows his emphasis on fourths and fifths, which are integrated into larger pitch collections. Moreover, it demonstrates a renewed concern for voice leading within a context that permits the use of all twelve pitches of the chromatic scale. This examination shows, more generally, that theoretical objectives must be clear. A theory textbook based on an individual style may be very successful. So may a practical book which theorises about music from the past (recent authors to have achieved popularity in this regard include Hepokoski & Darcy and Richard Cohn). However, if this distinction is unclear, or if one subtly introduces a different agenda without acknowledging it, then its legacy will be damaged. Furthermore, without the support of a dedicated student body, it can be hard for your work to be disseminated after you are gone.

It is not possible to say whether theorised music is any better or worse than abstract music, as the argument is never more than subjective: it comes down to personal preference. This was particularly apparent in the critical reception of the *Marienleben* revisions. However, it may be

observed that a theoretical basis to composition can help to produce a greater volume of music, although this music will be prone to becoming more homogeneous. Hindemith's music and theory will be remembered for the way it asks composers to engage with this issue, to look at their own processes and to question whether they should be more theory-based.

## Appendix: Pitch-Class Set List

PC Set	Prime Form	IC Vector
3-1	0, 1, 2	210000
3-6	0, 2, 4	020100
3-7	0, 2, 5	011010
3-9	t, 0, 5	010020
3-10	0, 3, 6	002001
3-12	0, 4, 8	000300
4-1	0, 1, 2, 3	321000
4-2	0, 1, 2, 4	221100
4-3	0, 1, 3, 4	212100
4-4	0, 1, 2, 5	211110
4-8	0, 1, 5, 6	200121
4-9	0, 1, 6, 7	200022
4-10	0, 2, 3, 5	122010
4-11	0, 1, 3, 5	121110
4-13	0, 1, 3, 6	112011
4-17	0, 3, 4, 7	102210
4-20	0, 1, 5, 8	101220
4-21	0, 2, 4, 6	030201
4-22	0, 2, 4, 7	021120
4-23	0, 2, 5, 7	021030
4-24	0, 2, 4, 8	020301
4-26	0, 3, 5, 8	012120
5-1	0, 1, 2, 3, 4	432100
5-3	0, 1, 2, 4, 5	322210
5-5	0, 1, 2, 3, 7	321121
5-6	0, 1, 2, 5, 6	311221
5-7	0, 1, 2, 6, 7	310132
5-9	0, 1, 2, 4, 6	231211
5-10	0, 1, 3, 4, 6	223111
5-16	0, 1, 3, 4, 7	213211
5-z18	0, 1, 4, 5, 7	212221
5-20	0, 1, 5, 6, 8	211231
5-21	0, 1, 4, 5, 8	202420
5-22	0, 1, 4, 7, 8	202321
5-23	0, 2, 3, 5, 7	132130
5-27	0, 1, 3, 5, 8	122230
5-30	0, 1, 4, 6, 8	121321
5-31	0, 1, 3, 6, 9	114112
5-35	0, 2, 4, 7, 9	032140
6-1	0, 1, 2, 3, 4, 5	543210
6-2	0, 1, 2, 3, 4, 6	443211
6-z3	0, 1, 2, 3, 5, 6	433221
6-z4	0, 1, 2, 4, 5, 6	432321
6-5	0, 1, 2, 3, 6, 7	422232
6-z6	0, 1, 2, 5, 6, 7	421242
6-7	0, 1, 2, 6, 7, 8	420243
6-z10	0, 1, 3, 4, 5, 7	333321
6-z11	0, 1, 2, 4, 5, 7	333231
6-z13	0, 1, 3, 4, 6, 7	324222
6-14	0, 1, 3, 4, 5, 8	323430
6-16	0, 1, 4, 5, 6, 8	322431
6-18	0, 1, 2, 5, 7, 8	322242
6-21	0, 2, 3, 4, 6, 8	242412
6-22	0, 1, 2, 4, 6, 8	241422
6-z23	0, 2, 3, 5, 6, 8	234222

6-z25	0, 1, 3, 5, 6, 8	233241
6-z26	0, 1, 3, 5, 7, 8	232341
6-32	0, 2, 4, 5, 7, 9	143250
6-33	0, 2, 3, 5, 7, 9	143241
6-34	0, 1, 3, 5, 7, 9	142422
6-35	0, 2, 4, 6, 8, t	060603
6-z36	0, 1, 2, 3, 4, 7	433221
7-1	0, 1, 2, 3, 4, 5, 6	654321
7-2	0, 1, 2, 3, 4, 5, 7	554331
7-4	0, 1, 2, 3, 4, 6, 7	544332
7-7	0, 1, 2, 3, 6, 7, 8	532353
7-8	0, 2, 3, 4, 5, 6, 8	454422
7-9	0, 1, 2, 3, 4, 6, 8	453432
7-10	0, 1, 2, 3, 4, 6, 9	445332
7-z12	0, 1, 2, 3, 4, 7, 9	444342
7-z18	0, 1, 4, 5, 6, 7, 9	434442
7-19	0, 1, 2, 3, 6, 7, 9	434343
7-20	0, 1, 2, 5, 6, 7, 9	433452
7-21	0, 1, 2, 4, 5, 8, 9	424641
7-22	0, 1, 2, 5, 6, 8, 9	424542
7-26	0, 1, 3, 4, 5, 7, 9	344532
7-29	0, 1, 2, 4, 6, 7, 9	344352
7-32	0, 1, 3, 4, 6, 8, 9	335442
7-35	0, 1, 3, 5, 6, 8, t	254361
7-z36	0, 1, 2, 3, 5, 6, 8	444342
7-z38	0, 1, 2, 4, 5, 7, 8	434442
8-1	0, 1, 2, 3, 4, 5, 6, 7	765442
8-2	0, 1, 2, 3, 4, 5, 6, 8	665542
8-3	0, 1, 2, 3, 4, 5, 6, 9	656542
8-4	0, 1, 2, 3, 4, 5, 7, 8	655552
8-5	0, 1, 2, 3, 4, 6, 7, 8	654553
8-6	0, 1, 2, 3, 5, 6, 7, 8	654463
8-7	0, 1, 2, 3, 4, 5, 8, 9	645652
8-8	0, 1, 2, 3, 4, 7, 8, 9	644563
8-9	0, 1, 2, 3, 6, 7, 8, 9	644464
8-12	0, 1, 3, 4, 5, 6, 7, 9	556543
8-13	0, 1, 2, 3, 4, 6, 7, 9	556453
8-z15	0, 1, 2, 3, 4, 6, 8, 9	555553
8-16	0, 1, 2, 3, 5, 7, 8, 9	554563
8-17	0, 1, 3, 4, 5, 6, 8, 9	546652
8-18	0, 1, 2, 3, 5, 6, 8, 9	546553
8-20	0, 1, 2, 4, 5, 7, 8, 9	545662
8-21	0, 1, 2, 3, 4, 6, 8, t	474643
8-23	0, 1, 2, 3, 5, 7, 8, t	465472
8-26	0, 1, 3, 4, 5, 7, 8, t	456562
8-28	0, 1, 3, 4, 6, 7, 9, t	448444
9-1	0, 1, 2, 3, 4, 5, 6, 7, 8	876663
9-2	0, 1, 2, 3, 4, 5, 6, 7, 9	777663
9-3	0, 1, 2, 3, 4, 5, 6, 8, 9	767763
9-5	0, 1, 2, 3, 4, 6, 7, 8, 9	766674
9-7	0, 1, 2, 3, 4, 5, 7, 8, t	677673
9-9	0, 1, 2, 3, 5, 6, 7, 8, t	676683
9-10	0, 1, 2, 3, 4, 6, 7, 9, t	668664
9-11	0, 1, 2, 3, 5, 6, 7, 9, t	667773

## Bibliography

- Adams, Charles, 'Melodic Contour Typology' *Ethnomusicology* Vol. 20, No. 2 (May, 1976) pp. 179-225
- Altwein, Erich F. W., 'Hindemith's calculation is not in error here...' *HJb* Vol. 1 (Mainz: Schott & Co., 1971) pp. 195-6
- Barbour, James Murray, *Tuning and Temperament: a historical survey* (East Lansing: Michigan State College, 1951)
- Bentzon, Neils Viggo, *Paul Hindemith* (Copenhagen: Artia, 1997)
- Berry, Wallace, *Structural Functions in Music* (New Jersey: Prentice Hall, 1976)
- Blackwood, Easley, 'In Memoriam: Paul Hindemith (1895-1963)' *Perspectives of New Music* Vol. 2 No. 2 (Spring-Summer, 1964) pp. 4-5
- Bobbitt, Richard, 'The Physical Basis of Intervallic Quality and its Application to the Problem of Dissonance' *Journal of Music Theory* Vol. 3 No. 2 (November, 1959) pp. 173-207
- Breuer, János, 'Die erste Bartók-Schallplatte. Das II. Streichquartett op. 17 in der Einspielung des Amar-Hindemiths-Quartetts' *HJb* Vol. 5 (1976) pp. 123-45
- Briner, Andres, 'Zwei Hindemithiana', *Neue Musik und Tradition* (Laaber: Laaber Verlag, 1990) pp. 533-6
- \_\_\_\_\_, *Paul Hindemith* (Mainz: Schott & Co., 1971)
- Brown, Howard Mayer, 'Curt Sachs' *New Grove Online*, accessed 9 August 2010
- Bush, Alan & Wilde, David, 'Franz Reizenstein' *The Royal Academy of Music Magazine* No. 196 (Midsummer, 1969) pp. 24-8
- Cahan, David, ed., *Helmholtz and the Foundations of Nineteenth Century Science* (Berkeley: University of California Press, 1993)
- Desbruslais, Simon, review of Stephen Luttman, 'Paul Hindemith: a Research and Information Guide', 2nd edn (New York: Routledge, 2009), *Twentieth-Century Music* Vol. 8, No. 2 (September 2011) pp 266-269
- Carter, Elliott, 'On the Nature of Music Theory' *Journal of Music Theory* Vol. 3, No. 1 (April, 1959) p. 170
- Cazden, Norman 'Consonance and Dissonance' (Harvard University, PhD, 1947)
- \_\_\_\_\_, 'Hindemith and Nature' *The Music Review* Vol. 15 (1954) pp. 288-306
- \_\_\_\_\_, 'Hindemith and Nature' *Journal of the American Musicological Society*, Vol. 7, No. 2 (Summer, 1954) pp. 161-164

- Cohn, Richard, 'Bartók's Octatonic Strategies: A Motivic Approach' *Journal of the American Musicological Society*, Vol. 44, No. 2 (Summer, 1991) pp. 262-300
- \_\_\_\_\_, 'Properties and Generability of Transpositionally Invariant Sets' *Journal of Music Theory*, Vol. 35, No. 1/2 (Spring - Autumn, 1991) pp. 1-32
- Cole, Hugh & Miller, Malcolm, 'Franz Reizenstein' *Grove Online*, accessed 20 November 2012
- Cook, Nicholas, *A Guide to Musical Analysis* (London: J. M. Dent & Sons, 1987)
- Copland, Aaron, *Aaron Copland: a reader: selected writings 1923-1972* (New York: Routledge, 2003)
- \_\_\_\_\_, *Copland on Music* (New York: Doubleday & Co., 1960)
- D'Indy, Vincent, *Cours de Composition Musicale* 3 vols. (Paris, 1902)
- Danuser, Hermann, 'Abscheid vom Espressivo? Zu Paul Hindemith Vortragsstil in den zwanziger Jahren' *HJb* Vol. 17 (Mainz: Schott & Co., 1988) pp. 26-40
- Delaere, Mark, 'Analyzing Contrapuntal Music: Some Remarks on the Fugues from Hindemith's *Ludus Tonalis*' *HJb* Vol. 24 (Mainz: Schott & Co., 1995) pp. 66-86.
- Dorfman, Joseph, 'Hindemith's Fourth Quartet' *HJb* Vol. 7 (Mainz: Schott & Co., 1978) pp. 54-71
- Dunsby J. & Whittall, A., *Music Analysis in Theory and Practice* (London: Faber, 1988)
- Forte, Allen & Gilbert, Steven E., *Introduction to Schenkerian Analysis* (New York: W. W. Norton & Co., 1982)
- Forte, Allen, 'Debussy and the Octatonic' *Music Analysis* Vol. 10, No. 1/2 (March-July, 1991) pp. 125-169
- \_\_\_\_\_, *The Structure of Atonal Music* (New Haven: Yale University Press, 1973)
- \_\_\_\_\_, 'Paul Hindemith's Contribution to Music Theory in the United States' *Journal of Music Theory* Vol. 42, No. 1 (Spring, 1995) pp. 1-14
- Foss, Lukas, 'In Memoriam: Paul Hindemith (1895-1963)' *Perspectives of New Music* Vol. 2 No. 2 (Spring-Summer, 1964) pp. 1-4
- Goebels, Franzpeter, 'Interpretationsaspekte zum *Ludus Tonalis*' *HJb* Vol. 2 (Mainz: Schott & Co., 1972) pp. 137-65
- Goldenberg, Yosef, 'Journal of Music Theory over the Years: Content Analysis of the Articles and Related Aspects' *Journal of Music Theory* Vol. 50, No. 1 (Spring 2006) pp. 25-63, Fiftieth Anniversary Issue
- Grout, Donald Jay & Palisca, Claude V., *A History of Western Music* (New York: W. W. Norton & Co., 2001)

- Gould, Glenn, 'A Tale of Two Marienlebens', *Das Marienleben* [CD Liner Notes] (Sony BMG, B001UC189E, 1978, 1995)
- Halliday, John, 'Paul Hindemith – the Theorist' (University of Rochester, Eastman School of Music, PhD, 1941)
- Headlam, Dave, 'The Shape of Things to Come? Seeking the Manifold Attractions of Tonality: A Geometry of Music: Harmony and Counterpoint in the Extended Common Practice by Dmitri Tymoczko' *Music Theory Spectrum* Vol. 34, No. 1 (Spring, 2012) pp. 123-143
- Heiden, Bernhard, 'Hindemith's System – A New Approach' *Modern Music* Vol. 19, No. 2 (Jan-Feb 1942) pp. 102-7
- Henze, Hans Werner, 'Das neue *Marienleben*' *Melos* Vol. 16, No. 3 (March, 1949) pp. 75-6
- Hindemith, Paul, 'Streicherkammermusik II' *Paul Hindemith: Sämtliche Werke* (Mainz: Schott & Co., 1993)
- \_\_\_\_\_, *Unterweisung im Tonsatz – Theoretische Teil* (Mainz: Schott & Co., first ed. 1937, second ed. 1940), *The Craft of Musical Composition* trans. Mendel, Arthur (Mainz: Schott & Co., 1942)
- \_\_\_\_\_, *Unterweisung im Tonsatz – Übungsbuch für den zweistimmigen Satz* (Mainz: Schott & Co., 1941), *The Craft of Musical Composition – Exercises in Two-Part Writing* trans. Ortmann, Otto (Mainz: Schott & Co., 1939)
- \_\_\_\_\_, *Unterweisung im Tonsatz: Übungsbuch für den dreistimmigen Satz* ed. Briner, A., Meyer, P. D. & Rubeli, A. (Mainz: Schott & Co., 1970)
- \_\_\_\_\_, *A Concentrated Course in Traditional Harmony* Vol. 1 (Mainz: Schott & Co., 1943), *Aufgaben für Harmonie-Schüler* trans. anon [probably Hindemith] (Mainz: Schott & Co., 1949)
- \_\_\_\_\_, *Elementary Training for Musicians* (Mainz: Schott & Co., 1946)
- \_\_\_\_\_, *Harmonie-Übungen für Fortgeschrittene* (Mainz: Schott & Co., 1949), *A Concentrated Course in Traditional Harmony* Vol. 2: *Exercises for Advanced Students* trans. anon [probably Hindemith] (Mainz: Schott & Co., 1953)
- \_\_\_\_\_, *A Composer's World: Horizons and Limitations* (Cambridge: Harvard University Press, 1952), *Komponist in seiner Welt* trans. Hindemith, Paul (Mainz: Schott & Co., 1959)
- \_\_\_\_\_, *Johann Sebastian Bach: Heritage and Obligation* (New Haven: Yale University Press, 1952)
- \_\_\_\_\_, *Das Marienleben: Introductory Remarks for the New Version of the Song Cycle* trans. Mendel, Arthur (Mainz: Schott & Co., 1948)
- \_\_\_\_\_, 'Methods of Music Theory' *The Musical Quarterly* Vol. 30, No. 1 trans. Mendel, Arthur, (Jan., 1944) pp. 20-28

- Hinton, Stephen, *The Idea of Gebrauchsmusik: a study of musical aesthetics in the Weimar Republic (1919 – 1933) with particular reference to the works of Paul Hindemith* (New York: Garland, 1989)
- \_\_\_\_\_, review of Neumeier, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986) *Music Analysis* Vol. 7, No. 3 (Oct., 1988) pp. 356-359.
- Holloway, Robin, 'Corrective to a Fault' *The Spectator* (27 March 2010)
- Holtmeier, Ludwig, 'From "Musiktheorie" to "Tonsatz": National Socialism and German Music Theory after 1945' *Music Analysis* Vol. 23, No. 2 (July, 2004) pp. 245-266
- Kemp, Ian, *Hindemith* (London: Oxford University Press, 1970)
- Kemp, Ian, 'Some Thoughts on Hindemith's Viola Concertos' *HJb* No. 35 (Mainz: Schott & Co., 2006) pp. 68-117
- Kepler, Johannes, *Welt-Harmonik* (Munich & Berlin, 1939)
- Kerman, Joseph, *Contemplating Music: Challenges to Musicology* (Cambridge: Harvard University Press, 1985)
- Kostelanetz, Richard ed., *Aaron Copland: a reader: selected writings 1923-1972* (New York: Routledge, 2003)
- Krenek, Ernst, *Horizons Circled: Reflections on my Music* (Berkeley: University of California Press, 1974)
- Krumhansl, Carol, *Cognitive Foundations of Musical Pitch* (New York: Oxford University Press, 1990)
- Kube, Michael, 'Am Quartettpult. Paul Hindemith im Rebner- und Amar-Quartett: Dokumentation' *HJb* Vol. 20-22 (Mainz: Schott & Co., 1991-3)
- Lampert, V., Somfai, L., White, E. W., Noble, J., Kemp, I., *New Grove Modern Masters: Bartók, Stravinsky, Hindemith* (New York: W. W. Norton & Co., 1984)
- Landau, Victor, 'The Theories of Paul Hindemith in Relation to His Practice as a Composer' (New York University, PhD, 1957)
- \_\_\_\_\_, 'Paul Hindemith, a Case Study in Theory and Practice' *The Music Review* Vol. 21 (1960) pp. 38-54
- \_\_\_\_\_, 'Hindemith the System Builder: a Critique of his Theory of Harmony' *The Music Review* Vol. 22 (1961) pp. 136-151
- Lee, Dong-Seon, 'A Structural Analysis and Performance Guideline of "Ludus Tonalis" by Paul Hindemith' (University of Washington, DMA, 1994)
- Leigh, Walter 'The Music of Paul Hindemith' *Essays on Music: an Anthology from The Listener* (London: Cassell, 1967) pp. 127-131

- Lerdahl, Fred & Jackendoff, Ray, *A Generative Theory of Tonal Music* (Cambridge: MIT Press, 1983)
- Lerdahl, Fred, 'Atonal Prolongational Structure' *Contemporary Music Review* Vol. 4 (1989) pp. 65-87
- \_\_\_\_\_, 'Calculating Tonal Tension' *Music Perception* Vol. 13, No. 3 (1996) pp. 319-363
- \_\_\_\_\_, *Tonal Pitch Space* (New York: Oxford University Press, 2001)
- Luttmann, Stephen, *Paul Hindemith: A Guide to Research* (New York: Routledge, 2005)
- Malcolm, Alexander *A Treatise of Musick: Speculative, Practical and Historical* (Edinburgh, 1721)
- McKay, James R., 'Easley Blackwood' *Grove Online*, accessed 19 November 2012
- Mellon, W. H., 'Hindemith Today' *The Chesterian* (September, 1947) p. 33
- Messiaen, Olivier *Technique de mon Langage Musical* (Paris: Alphonse Leduc, 1944)
- Morgan, Robert P., 'Dissonant Prolongation: Theoretical and Compositional Precedents' *Journal of Music Theory* Vol. 20 No. 1 (Spring, 1976) pp. 49-91
- \_\_\_\_\_, *Anthology of Twentieth-Century Music* (New York: W. W. Norton & Co., 1992)
- Morrison, Charles D., 'Prolongation in the Final Movement of Bartók's String Quartet No. 4' *Music Theory Spectrum*, Vol. 13, No. 2 (Autumn, 1991) pp. 179-196
- Neumeyer, David & Schubert, Giselher, 'Arnold Schoenberg and Paul Hindemith' *Journal of the Arnold Schoenberg Institute* Vol. 13, No. 1 (June, 1990) pp. 3-46
- Neumeyer, David, *The Music of Paul Hindemith* (New Haven: Yale University Press, 1986)
- \_\_\_\_\_, 'Counterpoint and Pitch Structure in the Early Music of Hindemith' (Yale University, PhD, 1976)
- \_\_\_\_\_, 'The Genesis and Structure of Hindemith's Ludus Tonalis' *HJb* Vol. 7 (1978) pp. 72-103
- Noss, Luther, *Paul Hindemith in the United States* (Urbana: University of Illinois Press, 1989)
- O'Connell, Kevin, 'Hindemith's Voices' *The Musical Times* Vol. 152, No. 1915 (Summer, 2011) pp. 3-18
- Olson, Steve, 'A Grand Unified Theory of Music' *Princeton Alumni Weekly* (Feb 9, 2011) [http://paw.princeton.edu/issues/2011/02/09/pages/6550/] accessed 19 July 2013
- Ortmann, Otto, 'An Analysis of Paul Hindemith's "Unterweisung im Tonsatz"' *Bulletin of the American Musicological Society* Vol. 4 (Sept., 1940) pp. 26-8
- Persichetti, Vincent, *Twentieth-Century Harmony: creative aspects and practice* (New York: W. W. Norton & Co., 1961)

- Piston, Walter, *Harmony* fourth edition (London: Gollancz, 1978)
- Pollack, Howard, *Harvard Composers: Walter Piston and his Students, from Elliott Carter to Frederic Rzewski* (The Scarecrow Press, Inc.: Metuchen, N.J., & London, 1992)
- Powell, Mel, 'In Memoriam: Paul Hindemith (1895-1963)' *Perspectives of New Music* Vol. 2 No. 2 (Spring-Summer, 1964) p. 1
- Rameau, Jean-Philippe, *Traité de l'harmonie* (Paris, 1722)
- Redlich, Hans F., 'Paul Hindemith: a Reassessment' *The Music Review* Vol. 25 (1964) pp. 241-253
- Rehding, Alexander, *Hugo Riemann and the Birth of Modern Musical Thought* (Cambridge: Cambridge University Press, 2003)
- Reizenstein, Franz, 'Paul Hindemith' *Essays on Music: an Anthology from The Listener* (London: Cassell, 1967) pp. 132-136
- \_\_\_\_\_, 'Hindemith: some aspersions answered' *Composer* 15 (April, 1965) pp. 7-9
- Rickards, Guy, *Hindemith, Hartmann and Henze* (London: Phaidon, 1995)
- Rubeli, Alfred, *Hindemiths A Cappella Werke* (Mainz: Schott & Co., 1975)
- Salzer, Felix, *Structural Hearing* (New York: C. Boni, 1952)
- Salzman, Eric, 'Paul Hindemith, Master of Many Trades' *New York Times* (15 Feb, 1959)
- \_\_\_\_\_, 'Piston: Ex-Teacher' *New York Times* (26 March, 1961)
- Schenker, Heinrich, *Free Composition* trans. Oster, Ernst, (New York: Longman Inc., 1979)
- \_\_\_\_\_, *The Art of Performance* (New York: Oxford University Press, 2000)
- Schoenberg, Arnold, *Theory of Harmony* (Berkeley: University of California Press, 1911, trans. Carter, Roy, 1978)
- Schubert, Giselher, 'Paul Hindemith' *New Grove Online*, accessed 16 April 2013
- Schubert, Giselher, 'Vorgeschichte und Entstehung der "Unterweisung im Tonsatz: Theoretischer Teil"' *Hjb* Vol. 9 (Mainz: Schott & Co., 1980) pp. 16-64
- Shackford, Charles, review of 'Übungsbuch für den Dreistimmigen Satz' *Journal of Music Theory* Vol. 16, No. 1-2 (Spring – Winter, 1972) pp. 238-265
- Skelton, Geoffrey, *Paul Hindemith: the Man behind the Music* (London: Gollancz, 1975)
- \_\_\_\_\_, *Selected Letters of Paul Hindemith* (New Haven: Yale University Press, 1995)
- Somfai, Lázló, *Béla Bartók: Composition, Concepts and Autograph Sources* (Berkeley: University of California Press, 1996)

- Stevens, Stanley Smith, & Davis, Hallowell, *Hearing: its Psychology and Physiology* (New York: John Wiley & Sons, 1938)
- Straus, Joseph, 'The Problem of Prolongation in Post-Tonal Music' *Journal of Music Theory* Vol. 31, No. 1 (Spring, 1987) pp. 1-21
- Stephan, Rudolf, 'Hindemith's *Marienleben* (1922-1948): an assessment of its two versions' *The Music Review* Vol. 15 (1954) pp. 275-287
- Taruskin, Richard, *The Oxford History of Western Music* (New York: Oxford University Press, 2005)
- \_\_\_\_\_, *The Danger of Music and Other Anti-Utopian Essays* (Berkeley, University of California Press, 2009)
- Taylor, Clifford, 'The Hindemith Theories: a Revaluation of Premise and Purpose' *The Music Review* Vol. 44 (1983) pp. 246-262
- Thompson, David M., *A History of Harmonic Theory in the United States* (The Kent State University Press, 1980)
- Thomson, William, 'A Clarification of the Tonality Concept' (University of Indiana, PhD, 1952)
- Truscott, Harold, 'Hindemith and "Das *Marienleben*"' *The Musical Times* Vol. 110, No. 1522 (Dec., 1969) pp. 1240-1242
- Tymoczko, Dmitri, 'Stravinsky and the Octatonic: a Reconsideration' *Music Theory Spectrum* Vol. 24, No. 1 (Spring, 2002) pp. 68-102
- \_\_\_\_\_, *A Geometry of Music* (New York: Oxford University Press, 2011)
- Väisälä, Olli, 'Concepts of Harmony and Prolongation in Schoenberg's Op. 19/2' *Music Theory Spectrum* Vol. 21, No. 2 (Autumn, 1999) pp. 230-259
- Vignal, Marc Hindemith, *2nd Sonata & Ludus Tonalis* [accompanying booklet to CD]; Richter, Sviatoslav (Pyramid Records, B000009IK2, 1995)
- Walden, Daniel, K. S., 'Noting Images: Understanding the Illustrated Manuscripts of Mendelssohn's *Schilflied* and Hindemith's *Ludus Tonalis*' *Music Theory Online* Vol. 16, No. 3 (August 2010)
- Wason, Robert W., *Viennese Harmonic Theory from Albrechtsberger to Schenker and Schoenberg* (New York: University of Rochester Press, 1985)
- Watt, Henry J., *The Foundations of Music* (Cambridge: Cambridge University Press, 1919)
- Weismann, Adolf, 'Notes from Abroad' *Musical Times* Vol. 64 No. 970 (December, 1923)
- \_\_\_\_\_, review of Hindemith's op. 22 in *Die Musik* 16 (1924) pp. 579-587

Whittall, Arnold, *Musical Composition in the Twentieth Century* (Oxford: Oxford University Press, 1999)

Wilson, Paul, 'Concepts of Prolongation and Bartók's Opus 20' *Music Theory Spectrum*, Vol. 6, (Spring, 1984) pp. 79-89

Winkler, Heinz-Jürgen, 'Hindemith-Jahrbuch / Annales Hindemith 2011/XL' *Hindemith Forum* Vol. 25 (Mainz: Schott & Co., 2012) pp. 15-16