Alexander Rehding, *Hugo Riemann and the Birth of Modern Musical Thought*. New York and Cambridge: Cambridge University Press, 2003.

Reviewed by Youn Kim

For a long time, historical studies of the sciences adopted a perspective variously known by the names *presentist, teleological, essentialist,* or *Whiggish.* Although these expressions carry slightly different meanings, we may roughly characterize this approach as an attempt to read the past in terms of present concerns; past scientific theories that had proven to be "wrong" and displaced by "right" theories are regarded as inferior fringe elements in the history of modern sciences. This approach is, of course, now passé. Most historical studies of the sciences, especially since the publication of Thomas Kuhn's influential work, are not afraid to explore neglected scientific concepts and theories, and tend to rely heavily on the conceptual and cultural frameworks derived from areas other than science itself.

I find it appropriate, therefore, to begin the review of Alexander Rehding's *Hugo Riemann and the Birth of Modern Musical Thought* with a discussion of the historiography of science. First, the union of history and science—as well as that of history and music theory—presents some problems. Although it may be naïve, it is undeniable that most people still feel odd about the joining of science and history: the former is forward-looking and concerned with nature, whereas the latter is retrospective and deals with humanity. Likewise, the conjunction of music theory and history raises some conceptual difficulties. In Thomas Christensen's words, music theory is a "subject that notoriously resists its own history" (2002:1).[1] Second, the parallelism between science and music theory is significant in studies of late nineteenth-century music theory, particularly in the study of Hugo Riemann's ideas. Given that many of these theories aspired to scientific grounding, we may parallel historical approaches to the music theory of this period with historiographies of science. In attempting to discuss the shift in perspective in the realm of music theory's history, we find Riemann's notion of "harmonic dualism" the best case in point. Riemann believed that "minor triads are symmetrically opposed to major triads and work upside-down" (Rehding 2003:7), an idea that was quickly discredited by many later-generation theorists.[2] Contemporary scholar Scott Burnham points out that our interest in "constructing the pre-history of today's theory" blinds us to

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the potential value in examining Riemann's ideas. Burnham advocates a "shift in emphasis" that

> would involve treating all theories as systems of thought with their own integrity and as cultural/historical products with their own ways and means ... We thus move away from "why does Riemann insist on dualism?" as a rhetorical question along the lines of "why does he continue to bet on a lame horse (when he has stable winners)?" to "why does Riemann need dualism?" as a real question with the possibility of a revealing answer. (1993:79)

Burnham exemplifies the shift in difference from "constructing the pre-history of today's theory" to "understanding the history of music theory as an intellectual and cultural history" through the questions centering around Riemann's harmonic dualism. It is precisely these questions that Alexander Rehding addresses in *Hugo Riemann and the Birth of Modern Musical Thought.*

It is no wonder that Riemann's harmonic dualism comes to the fore when we speak of the changing perspective in music theory history. His writing shows extraordinary breadth, ranging from theory to analysis, aesthetics, history, and, at the end of his career, even ethnomusicology. His life (1849–1919) falls squarely within the formative period of musicology, and his scholarly works in these various realms contributed to the formation and development of musicology as a modern academic discipline. Riemann's influence is enormous and still continuing. Take the field of contemporary harmonic theory, for example. In Germany, his theory of harmonic function is in "common currency" and "in fact replaces the Roman-numeral taxonomy common in English-speaking countries" (Rehding 2003:7); in North America, Riemann's harmonic theory is still evident in a host of theories labeled "neo-Riemannian." These two branches of music theory have different purposes—one pedagogical and the other analytical—but both commonly dismiss the idea of harmonic dualism. Theories of harmonic function widely taught in Germany are monistic versions, while North American Neo-Riemannian theory "strips" the concepts of triadic transformations and common-tone maximizations of their "dualistic residues" (Cohn 1998:169).[3] It is understandable that Riemann's followers detached dualistic thinking from the practical teaching of harmony and the analytical practice; the idea of harmonic dualism could be a "pedagogical handicap."[4] Besides this element of impracticality, however, we may easily arrive at another reason for the total rejection of harmonic dualism: the notion upon which harmonic dualism is based—that is, the concept of undertones—could not be proven scientifically and is therefore understood to be

false.

Rehding not only places this apparently false notion of undertones at the very center of Riemann's harmonic theory, but also re-examines the meaning of falseness as such (in chapter 2). The mistaken theory that others had treated as a fringe element is here taken as central. In order to assess Riemann's theory in its own right, Rehding thoroughly investigates the cultural and historical context of modern musicology's formative period, identifying the rationales and motivations behind Riemann's thoughts. His approach embodies Burnham's "shift in emphasis" most brilliantly, and in the most convincing manner, contrasting sharply with the teleological viewpoint, that, ironically, is best exemplified in Riemann's own historical account of harmonic theories.[5]

In addition to placing the notion of undertones at the center of Riemann's harmonic theory, Rehding takes it as the cornerstone upon which he reconstructs Riemann's whole enterprise of musical thought. Several central concepts in Riemann's theory such as undertones, musical hearing, musical logic, cadence, musical syntax, and *Tonvorstellungen* are introduced one by one in each chapter and create a complex conceptual network with the notions to which Riemann often appealed, such as nature, history, cognition, practice, and science. In doing so, Rehding efficiently retrieves the integrity of Riemann's writings ranging over various fields of musicology.

The book is composed of an introduction, five chapters, an epilogue, and a valuable glossary containing Riemann's key terms as explained in the *Musik-Lexikon* (1900). Chapter 1 addresses Riemann's experiment to prove the existence of undertones and examines it in the framework of the development of nineteenth-century German science. Chapter 2 examines two central ideas in Riemann's harmonic theory, the grid of harmonic relations and harmonic function, using these ideas to shed light on the role of music theory as conceived by Riemann. In chapter 3, Rehding investigates the notion of cadential order and the "musical logic" residing within it, in conjunction with the relationship among logic, nature, and history in Riemann's thought. Chapter 4 looks into "musical syntax"—yet another metaphor that frequently turns up in Riemann's writings—and examines the change in Riemann's notion of language in the context of German nationalism. Chapter 5 centers around three issues that occupied the final period of Riemann's career: the compositional process, the notion of *Tonvorstellungen*, and the field of ethnomusicology.

In the introduction, Rehding identifies two fundamental concepts presiding over Riemann's musical thought. One is the notion of "musical hearing"—or, to put it in Riemann's own terms, "how do we hear music" (*Wie*

hören wir Musik?). The other is the concept of harmonic dualism. When we try to reconcile Riemann's two basic notions, however, we confront a serious problem: we do not "hear" the minor triads upside-down. Therefore, in addition to being false and impractical, the idea of harmonic dualism appears to present a serious obstacle for Riemann to construct a systematic and coherent all-inclusive musicological enterprise.

How then should we understand Riemann's consistent claim about these two seemingly incompatible notions? Rehding finds the key to resolving this apparent contradiction between Riemann's two central notions by reinterpreting the question "how do we hear music?" It is, according to him, not so much about "how we *do* actually hear music," but rather, "how we *ought* to hear music." The famous break between Riemann and Max Reger that is recounted at the end of the introduction gets to the heart of the matter: for Riemann, music theory carries the *responsibility* to explain what we ought to hear, and musical compositions and practice should conform to what music theory prescribes. Consequently, compositions should comply with harmonic dualism, one of the ways in which we *ought* to hear music.

Chapter 1 begins with yet another anecdote: on a night in 1875, Riemann experimented with his grand piano and claimed to hear the undertone series (*Untertonreihe*), proving that the undertone series, like the overtone series (*Obertonreihe*), was a real acoustic phenomenon. Situated in the proper context, this story gives us significant clues as to Riemann's motivation. Rehding describes the prestige enjoyed by nineteenth-century science, explaining how theorists such as Arthur von Oettingen and Moritz Hauptmann attempted to capture some of this prestige for music. By establishing harmonic dualism's intellectual and cultural context, Rehding brings new light to the definition of harmonic dualism itself, which has not always been clear-cut. In addition to defining the "aesthetic postulate" and "levels of methodology," Rehding claims that a dimension of "historical argument" should be considered in the definition of harmonic dualism. Taking all three dimensions into account, harmonic dualism is redefined as "the attempt to declare the major and minor modes as natural, in conflict with the scientifically accepted concept of nature at the time" (31).

Once Rehding has established the definition of harmonic dualism, he poses the central question of the chapter: "Why did harmonic dualism go out of fashion in the early twentieth century and become considered wrong?" (31). Rehding locates the reason for this in an uneven "paradigm shift": "while musicology, or rather its epistemological aspect, has moved away from a paradigm based on acoustical science, the acquisition of knowledge in most other areas has remained firmly anchored in an unwavering faith in

science" (32). This "double-layered" epistemology is best reflected in our assessment of harmonic dualism. Current tonal theory does not value acoustical data as such; in contradiction to this epistemological move away from acoustical science, we are dismissing the notion of dualism for the very reason that acoustics does not confirm it. In other words, the wrongness of harmonic dualism is not inherent in the theory itself, but a consequence caused by the paradigm shift.

Just as chapter 1 re-examines the "wrongness" of harmonic dualism, chapter 2 challenges us to rethink the role of music analysis and theory as a whole. The brilliantly chosen illustration opening this chapter is Riemann's analysis of the Waldstein sonata, which appeared in his *L. van Beethoven's sämtliche Klavier-Solosonaten* (1919). Rather than speaking in terms of failure, Rehding writes that "Riemann *chose* not to make this symmetrical potential [of harmonic dualism] into a feature of his analysis" (37; emphasis added). The chromatically descending bass, the foremost characteristic of the passage, was not featured in Riemann's analysis. From this observation, Rehding surmises that Riemann intentionally underplayed the particularity of this passage and highlighted its general form and ordinariness instead.

Such an approach clashes with a commonly-held view in the field today that evaluates the success of a music theory "if it can tell us something about musical practice, or a musical composition, that in turn enhances the listening experience"—what Rehding calls the instrumentalist approach to analysis (36). Seen from this perspective, Riemann's analysis seems Procrustean: instead of enhancing the distinctive features of the passage, he tries to fit the passage into the normative mold that his theory prescribes (eight-measure period). Once we explore another angle, however, we begin to see that the purpose of Riemann's analysis was to make the passage ordinary.

After the microscopic discussion of a passage from the Waldstein sonata, the author takes a step back and discusses essays by Carl Weitzmann and Franz Peter Graf Laurencin, authors of the two winning entries of an 1859 competition sponsored by the *Neue Zeitschrift für Musik*. An examination of these articles helps untangle the relationship between nineteenth-century music theory and the very notion of "modernity" in music. In musical discourse, the term "modernity" tends to maintain its historical origin in the view of progressive music history held by many nineteenth-century composers, notably by Wagner. As Leon Botstein explains, "The art of music was perceived to need to anticipate and ultimately to reflect the logic of history."[6] Such nineteenth-century composers considered themselves to be at the forefront of history, and relied on music theory to legitimize their

progressiveness. Music theory, Rehding concludes, was "one of the institutions on which the modernity of music rests" (43).

In this vein, Riemann's entire theoretical enterprise can be seen completely differently. The two pillars of Riemann's harmonic theory—the grid of harmonic relations and theory of harmonic functions—are interpreted by the author in the following manner: the grid is a demonstration of full harmonic potential (based on Riemann's aspiration for a scientifically-true music theory), while the concept of harmonic function delimits how far one may move within a key. According to Rehding's reading, Riemann demands that music theory deal with not only what is possible but also, and more significantly, what is permissible. Musical compositions with which Riemann did not engage, such as Wagner's *Tristan*, were considered to have gone too far beyond these permissible boundaries.

The spatial image of the grid as the "maze of possible harmonic successions" and harmonic function as the "delimiting signpost" (61) is more than a mere metaphoric image: it not only continually emerges throughout the rest of the chapters, but also is a significant key to solving the initial question concerning the conception of harmonic dualism. It is also interesting to note that the central concept to be examined in the next chapter is "musical logic." The notion is often referred to as the *roter Faden* (literally, "red thread") of Riemann's work, which alludes to an orientation device used in weaving textiles. A parallel can thus be drawn between Riemann's harmonic function as a signpost and musical logic as a red thread, both functioning as an orientation device.[7]

Chapter 3 investigates the notion of "musical logic," which Riemann thought resided in the ideal model of cadential succession. What is denoted by the phrase "musical logic" varies, however, as his theory of harmony developed across the course of his life. Among these various meanings of musical logic, that which appears in Riemann's *Systematische Modulationslehre* (1877) receives particular attention here since it was in this treatise that harmonic function and metric weights were combined together to form an ideal cadential order. The actual chord progression is compared against this "*a priori* model," and the harmonic function of individual chords is thus determined. Besides this, Riemann rationalizes the cadential logic in terms of the acoustical principle: the model cadence in major (T–S–D–T) rests on the overtone series whereas the "pure minor" cadence (T–S–D–T) rests on the undertone series. The discussion of cadential order raises the epistemological problem of undertones discussed in chapter 1 and in so doing, allows us to see the point of contact where the notions of nature, history, and logic meet with another. Rehding writes:

> Nature is that which is constant throughout history and which provides the unchanging rules for musical logic; history gradually reveals the nature of harmony in musical compositions and perpetuates the truth about musical logic; and logic itself, finally, can be traced in "classical" pieces of music and is the living proof that reason manifests itself through nature and history. (99)

In addition to identifying the three authorities to which Riemann frequently appealed and establishing an intimate relationship among them, Rehding unearths the element commonly found at these three poles: the notion of "as-if," an idea associated with nineteenth-century German philosopher Hans Vaihinger. According to Vaihinger, we never fully know the reality of the world: we construct systems of thought and equate this fiction with the real. (Scientific theories are one example of the fictional instruments we use to comprehend the real.) Riemann's notion of the undertone series best exemplifies Vaihinger's notion of "fiction"; after all, the very existence of undertones is motivated by their explanatory power. Cadential models can be viewed in a similar vein. Riemann presents the cadential order "as-if" they were the normative prototypes and in doing so, presents the reader with the "chief paths" through the area of harmony, with which "everybody may find new side paths for himself" (105). The spatial image of maze and guiding signpost is resurfaced here once again.

Chapter 4, "Musical Syntax, Nationhood and Universality," explores another metaphor that is frequently encountered in Riemann's writings. The notion of "musical syntax" is the point of intersection where the seemingly contradictory ideas of "nationhood" and "universality" meet. Riemann continually modified the idea of musical syntax throughout his life. Rehding traces the conceptual change against the background of the newly established discipline of comparative linguistics, and the cultural context of German nationalism in the 1890s. In a similar vein to the comparative linguists' theory of a universal grammar, Riemann posited the diatonic scale as the "basic form of all music" and a consequence of the natural *Klänge* (121). For Riemann, every nation is endowed with the same potential to develop the diatonic scale out of natural, universal triads; some nations are capable of doing so to the fullest extent, whereas others are not.

In the 1890s, Riemann's argument took a nationalist tone; he attributed the origins of harmonic music to the Germanic people, and claimed to have restored music-theoretical hegemony to modern Germany. He championed Johann Stamitz as the precursor to the Viennese school while marginalizing Austrian composers Mozart and Haydn. In order to examine Riemann's notion of musical language against this nationalist tendency, Rehding compares two musical analyses by Riemann: the analysis of Liszt's *Faust* Sym-

phony and that of Berlioz's overture to *Benvenuto Cellini*. In the former, Riemann reduces the "deliberately labyrinthine" passage to an example of an "open-ended minor cadence," whereas in the latter he intentionally employed the function labels in order to demonstrate that Berlioz—the "French influence"—was endangering German music by deviating from a prescribed path of harmonic succession for the sake of leitmotivic effects (150–53). Like language, music was considered a marker of national identity, and for Riemann, the identity of German musical language was something that had to be guarded and regenerated.

In chapter 5, Rehding examines three at first seemingly unrelated issues: 1) Riemann's infamous "meddling" with scores (as illustrated by his rebarring of Beethoven's piano sonata); 2) his psychological theory represented by the notion of *Tonvorstellungen*; and finally 3) his ethnomusicological concerns. These three apparently discrete topics occupied Riemann in the later part of his life; through a thorough examination of all three, Rehding illuminates how these were intertwined.

Riemann (i.e., the later Riemann) presupposed a process of musical communication as follows: music originates in the composer's mind; this music of the mind is transformed into sounding music, either through notation and performance or through improvisation. The sounding music is in turn re-transformed into music in the listener's mind. To put it in Riemann's own words,

> "The Alpha and Omega" of music is not found in the actual sounding music but, rather, exists in the image of tonal relationships (*Vorstellung der Tonverhaltnisse*) that lives in the creative artist's imagination before it is written down in notes and reemerges in the listener's imagination. (Riemann 1992:82)[8]

In this scheme, the score is regarded as a mere transmitter; such a disrespect of notation is indicative of a strong emphasis Riemann placed on the mental representation of music—that is, the *Tonvorstellungen*.

It appears that this psychological turn also brought changes in Riemann's formerly nationalistic tone examined in the previous chapter. His "Neue Beiträge zu einer Lehre von den Tonvorstellungen" ("New Contributions to the Theory of *Tonvorstellungen*," 1917) contains discussions of Slavic folksongs that demonstrate how intimately related psychological and ethnomusicological concerns were for the later Riemann. In leaving the physical realm and stepping into the domain of mental representation, Riemann seemed to take musical logic for something that "can be subject to historical or ethnic contingencies" (Rehding 2003:169). These interests in non-Western music may be construed as a complete rejection of the faith in

the transcendental nature of triadic hearing and his formerly Eurocentric view. Rehding challenges this reading of Riemann. In these studies of non-Western music, Rehding argues, Riemann adopted the melodic-scalar approach, instead of the harmonic-triadic one. This does not point to cultural relativism but, rather, indicates that his old contention of the primacy of major thirds is still at work: seen from Riemann's evolutionary historical viewpoint, non-Western music—devoid of the major third as the "wheel of progress"—was imperfect.

Here we find ourselves back to the topic that initiated the entire discussion: harmonic dualism. Rehding integrates the seemingly fluctuating and inconsistent musical thoughts of Riemann:

> It would seem, then, that very little actually changed from the beginning... harmonic dualism, which failed to find its place in the consciousness of contemporary composers, lived on in the purer realm, detached from the European mainstream. There it remained a keepsake of a utopia of music... while Riemann had realized that harmonic dualism was a hindrance to the functioning of his system of harmony, the idea could live on in his tonal imagination. (176)

The last part of the chapter deals with Riemann's contribution to comparative musicology, a subject that remains contentious today. Highlighting the tension between Riemann and his contemporaries Karl Stumpf and Eric von Hornbostel, Rehding notes that Riemann actually believed in the adequacy of notation against the epistemological claim of the phonograph, the newly introduced tool of comparative musicology. We can draw another parallelism here with the history and philosophy of science: a scientific instrument (the phonograph in this case) is not just a mere aiding device but expresses the way we conceive the object of our study. Riemann was against the "direct sonic imprints" the phonograph provided: despite his apparent disrespect for the score examined at the beginning of this chapter, he believed "that the constraints of notation, the regulatory framework it provided, were fully adequate in conveying the necessary element of music" (179).

Given that Riemann continually attempted to improve notational methods instead of completely abandoning them, such an interpretation is more convincing. Rehding seems to find Riemann's belief in the adequacy of notation contradictory to Riemann's notion of *Tonvorstellungen* and the advent of phonograph recordings. Yet a closer examination of Riemann's ideas suggests that Rehding missed an opportunity to reconcile these two seemingly contradictory developments. Riemann defines *Tonvorstellungen* as mental images which obtain "all the attributes of actually sounding music...

including the most subtle distinctions of timbre and also the strongest dynamic effects" (Riemann 1992:83). Nonetheless, this does not mean that *Tonvorstellungen* are direct sonic impressions: on the contrary, they are characterized by the involvement of constructive activity of the mind itself, rather than a mere passive reception of external events (i.e., Helmholtz's notion of *Tonempfindungen*). Provided that the score—unlike the phonograph, which presents us with immediate sonic images—necessarily posits a mental activity to transform the written music into the music of mind, Riemann's acceptance of the score as the proper conveyer of musical thought is perfectly in line with his psychological notion of *Tonvorstellungen*.

The book's epilogue begins with an analysis of Nietzsche's remarks on Riemann. In Riemann's "obsession with detail" and his "attempt to pin music down to the last facet," Nietzsche saw the indication of "decadence," against which Riemann persistently battled (Rehding 2003:185). In a sense, Nietzsche's observation points to the fact that Riemann's entire system of musical thought was at the sunset of the culture of decadence, and at the dawn of modern thought.

The Nietzsche-Riemann relationship is also related to the analogy of architectural and musical forms to which Riemann often referred. Riemann frequently appealed to Nietzsche's authority in order to support his claim for the significance of motives, the smallest building block of musical structure, and Nietzsche, who was trained in classical philology, in turn gave approbation to Riemann's theory of phrase structure.[9] In both the introduction and epilogue, Rehding cites and compares two passages in which Riemann speaks of an analogy between architectural and musical forms, one excerpt from *Wie Hören wir Musik?* (an aesthetic treatise) and the other from *Systematische Modulationslehre* (a composition treatise). Rehding uses this analogy to reconstruct Riemann's system of musical thought: just as musical hearing begins with the smallest unit, the whole edifice of Riemann's musical thought is based upon the "small hypothesis of the undertones"—the scientific fiction of harmonic dualism. The seemingly independent and even incongruent parts of this edifice are joined together around the common foundation of harmonic dualism. In other words, Rehding takes the spatial metaphor which Riemann used to conceptualize musical hearing and applies it to reconstruct Riemann's whole enterprise of musical thought.

Similar statements are also found in Riemann's essay "Symmetrie oder Parallelismus?":

> in the case of music hearing we are actually dealing with an accumulation (*Ansammeln*). For the musician, listening to a piece of music is by no means

> only something temporally flowing, which is over once the final cadence arrives; rather, if he has listened correctly, it is a finished whole within a kind of spatial existence that stands before his soul at the end. Everybody uses the metaphor of construction of a musical piece, speaks of the piling up of motives, etc., and in so doing sets up no mere futile comparison. Rather, the motives grasped by the skilled listener are building blocks, nay: the smallest self-enclosed units of the art work, which he does not stack up in his memory one behind another, rather, which after he has understood them as they flow by temporarily, he collates one to another. He actually constructs as a whole from these parts first a number of smaller wholes (thematic patterns), which are collated with one another yet again and that which has come into being temporally finally stands as an actual spatial thing, for which the use of the term symmetry appears not inappropriate. (Riemann 1900:149–50)[10]

I quote this passage at length since it contains an expression that does not feature in either of the excerpts in Rehding's book. Here Riemann underscores the phrase "accumulation" (*Ansammeln*) to describe the course of musical hearing. The spatial metaphor and the expression of accumulation, which characterize Riemann's way of conceptualizing musical hearing, also captures the way in which Rehding develops his arguments throughout the book. While beginning with the discussion of the undertones and ending with that of his theory of *Tonvorstellungen*, Rehding's book follows the chronological development of Riemann's theory, but only at the surface. From the undertones, to harmonic function, grid of relationships, harmonic logic, harmonic syntax, exotic music, and *Tonvorstellungen*, the themes of each chapter are accumulated to form a complicated but coherent network of various concepts, a reconstruction of Riemann's thoughts that is completed at the end. It is a clever choice to reproduce an image of Cologne Cathedral on the front jacket of the book: this image is suggestive of how Riemann conceptualized musical hearing, how the entire system of Riemann's thought may be conceived, and finally, the way in which Rehding advances his argument. I believe such a shaping of the book into an architectural form enabled the integration of Riemann's ideas on diverse areas more effectively.

Late nineteenth-century music theories are generally characterized by their aspiration to be "scientific." It should be noted here, however, that the notion of "scientific" was not solid in itself at that time. The case that best exemplifies the fluctuating notion of "scientific" is the field of psychology, which had just been established as an independent discipline. Referring to a passage from "Natur der Harmonik" (1882), Rehding writes that Riemann considered psychology a "hard science" (89). This statement could be misleading, for Riemann's conception of psychology varies. In *Grundriss der Musikwissenschaft*, Riemann writes:

> [*Musikwissenschaft*] is thus rooted in the exact sciences, [such as] mathematics and mechanics, on one hand, and also in the purely human sciences of philosophy, logic, and aesthetics, on the other; physiology and psychology must constitute the bridge connecting these extremes. (Riemann 1908:9)[11]

Then again, in his 1916 essay, Riemann seems to draw his psychological theory of *Tonvorstellungen* closer to the "purely human sciences":

> The present work is intended to point out a new direction that differs from those previously known and available, less in its ancillary doctrines than its total aim, its point of departure and final goal. One would be inclined, not without justification, to assign this direction to the literature of musical aesthetics. However, its strong contact with the musical practice of composition as well as performance (reproduction) classifies it as music theory in the narrower sense—indeed, as a new branch of the speculative theory of music, which one also calls philosophy of music. (Riemann 1992:92)

It should also be noted that Riemann's explanations of the undertone series were in constant flux as well. Rehding, of course, notes the change from something perceptible (as in Riemann's experiment with his grand piano in 1875) to something inaudible due to the interferences of sound waves (as in *Handbuch der Akustik*, 1891). It is noteworthy that two years prior to the moonshine experiment, Riemann attributed a physiological explanation to the inaudibility of the undertones: "I therefore claim that the fibers on the basilar membrane corresponding to the undertones of a given tone resonate [only] partly and hence we obtain the *Vorstellungen* of undertones [only] implicitly" (Riemann 1873:12).[12] As Rehding rightly notes, Riemann disavowed the physical existence of the undertones in his essay "Das Problem des harmonischen Dualismus" (1905), but did not completely abandon the dualistic idea. Here the notion of the undertone series (*Untertonreihe*) are re-conceptualized into the underseries (*Unterreihe*: the simple ratios in the increase of wave-length), whereas the overtone series (*Obertonreihe*) becomes the overseries (*Oberreihe*: the simple ratios in the increase in frequency).

An examination of the constant changes in Riemann's conception of psychology and his grounding of the undertones points toward the now widely recognized dictum of the history of science: that we should be careful not to assess past theories by the present standard. Rehding's examination of the undertone series in light of Vaihinger's philosophy and nineteenth-century polemics surrounding the existence of the atom allow us to view the meaning of "being scientific" in a completely new light. The no-

tion of *Tonvorstellungen* can be regarded similarly: after all, the psychological concept of *Vorstellungen*, the "psychic atoms," was treated analogously to the way "fictional" concepts in science were considered.[13] Just as in physics, psychology could profit from postulating a set of fictional concepts that give rise to laws, as long as these laws could be made to conform to actual psychic phenomena. Riemann's incomplete theory of *Tonvorstellungen* was scientific in this sense.

Rehding's work is distinct from other recent publications such as Arntz (1999), which presents a detailed biography of Riemann based upon extensive archival works, and Böhme-Mehner and Mehner (2001), which is an anthology of articles. Instead of tracing the change in Riemann's thought chronologically or presenting us with a collection of articles that focuses on a specific issue, Rehding integrates the parts of Riemann's musical thought, which otherwise appear to be distant from each other either chronologically or conceptually, into a coherent configuration. This book is not only informative and insightful, but also very absorbing: it constantly challenges the reader's preconceptions and provides a new perspective from which the object of study can be seen differently. This book would be equally profitable to music theorists interested in Riemann's theory and music historians studying turn-of-the-century musical culture, for it sets up a brilliant exemplary case showing how we ought to understand past music theory.

Notes

1. Christensen expounds the statements Carl Dahlhaus made in his works on the history of music theory; see Dahlhaus (1984; 1985).

2. The term harmonic dualism, which is loosely defined here, is further elaborated in a multidimensional analysis in chapter 1.

3. This is, of course, not to say that the notion of harmonic dualism was completely set aside. Some recent studies such as Harrison (1994) adopt the idea of harmonic dualism and expound a "renewed dualist theory" although they tend not to consent to it in entirety.

4. See *New Grove Dictionary of Music*, 2nd ed., s.v. "Grabner, Hermann" (by Hanspeter Krellmann and Daniel Harrison).

5. Burnham (1992) discusses the historiography and underlying motivations of Riemann's *Geschichte der Musiktheorie*.

6. See *New Grove Dictionary of Music*, 2nd ed., s.v. "Modernism" (by Leon Botstein). Blasius (2001) investigates the relationship between Riemann's music theoretical system and Wagner's endeavors to create a *Gesamtkunstwerk*, taking Nietzsche's philosophy as the central axis.

7. For a detailed study of the expression "red thread," see Grey (1996).

8. Riemann's two articles, "Ideen zu einer 'Lehre von den Tonvorstellungen" and "Neue Beitrage zu einer Lehre von den Tonvorstellungen" were written for the journal *Jahrbuch der*

Musikbibliothek Peters für 1914/15 and *1916*, respectively. The publications of these two volumes were postponed until 1916 and 1917 due to the war. For his 1916 article, Marvin and Wason's translation (1992) is used and the page number of the English translation are given; other excerpts from Riemann's writings are my translations and the page numbers of the original German are given.

9. For Riemann's reference to Nietzsche, see Riemann (1918:32; 1903:VIII).

10. " . . . dass es sich bei Musikhören thatsächlich um ein Ansammeln handelt. Für den Musiker ist das anhören eines Musikwerkes durchaus nicht nur etwas zeitlich verlaufendes, was, wenn der Schluss gekommen, vorüber ist; hat er recht gehört, so steht vielmehr am Schluss ein fertiges Ganzes in einer Art räumlicher Existenz vor seiner Seele . . . Vielmehr sind die von einem fähigen Hörer aufgefassten Motive Bausteine, nein; in sich abgeschlossene kleinste Glieder des Kunstwerks, die er nicht in seinem Gedächtnis hinter einander ablagert, sondern die er, nachdem sie zeitlich verlaufend ihm verständlich geworden, einander gegenüberstellt. Er baut aus diesen Teilen wirklich ein Ganzes, zunächst eine Anzahl kleinerer Ganzen (thematische Gebilde), welche wiederum einander gegenüber gestellt bleiben, und das zeitlich gewordene steht am Ende als ein wirklich Räumliches, für welches die Anwendung des Ausdrucks Symmetrie mir in keiner Weise bedenklich erscheint" (Riemann 1900:149–50).

11. "Sie steht daher einerseit auf dem Boden der exakten Wissenschaften, der Mathematik und Mechanik, andererseits aber auch auf dem der reinen Geisteswissenschaften, der Philosophie, Logik und Ästhetik, und die die Extreme verbindende Brücke haben die Physiologie und die Psychologie zu schlagen" (Riemann 1908:9).

12. "Ich behaupte daher: die den Untertönen eines angegebenen Tones entsprechenden Fasern der Membrana basilaris schwingen partiell mit und wir haben adaher die Vorstellungen der Untertöne implicite" (Riemann 1873:12).

13. A nineteenth-century German philosopher Johann Friedrich Herbart proposed a psychological program that came to be known as the "psychology of *Vorstellungen*," in which *Vorstellungen* was regarded as the psychological elements that constitutes the human psyche. The term "psychic atom" is borrowed from Wolman (1968).

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