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Sensations of Tone: Colored Hearing and the Decline of Meter in French Verse

Yamaguchi, Liesl Marie Jensen

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Sensations of Tone: Colored Hearing and the Decline of Meter in French Verse

Liesl Marie Jensen Yamaguchi

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ABSTRACT

Sensations of Tone traces the emergence of the notion that vowels possess specific visual properties (the idea that "I" is bright, or "A" is red, for example). This idea, first attested in Europe in a Bavarian medical dissertation in 1812, grew from a curiosity of dubious credibility into a significant topic of intellectual inquiry by the 1890s. Over the course of the nineteenth century, accounts of vowels' tones, colors, shades, and hues appeared with increasing frequency across disciplines ranging from medicine to musical acoustics, psychology, poetics, and linguistics. The ways in which vowels appeared to bear visual properties were multiple, however, and many of the nineteenth-century accounts, failing to meet the criteria eventually established by the scientific study of synesthesia, have fallen into obscurity. This dissertation, tracing the emergence of the idea of vowel color, rather than seeking to distinguish and define a medical condition, considers accounts of colored vowels that the modern study of synesthesia has been obliged to cast aside. Through close readings of these accounts—by Arthur Rimbaud, Hermann von Helmholtz, Paul Verlaine, Stéphane Mallarmé, Ferdinand de Saussure, and Roman Jakobson—the dissertation demonstrates how the vowel colors that emerge independently in disparate disciplines are mutually illuminating. Taken together, they bear witness to a subtle but decided shift in linguistic perception in the late nineteenth century: a shift emblematically realized in France in the decline of the metrical line and the emergence of vocalic color. *Sensations of Tone* thus furnishes a new perspective on the emergence of free verse, a watershed moment in poetic history whose contemporaneity with the scientific inquiry into colored hearing is well known, but whose relationship to that inquiry has been understood as merely coincidental. Breaking with the traditional narrative that charts meter's decline against graphic conceptions of poetry, *Sensations of Tone* suggests a more complex relationship between language and visuality, and an argument that verse—poetry linguistically rather than graphically defined—persists into the present.

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I have succeeded only very partially in that pursuit, as will be obvious, but any progress I have made should be credited to his and my many interlocutors' extraordinary generosity. Ann Smock, Joshua Katz, Marielle Macé, and David Bellos have read and commented with a care and incisiveness I could never have imagined; they, along with Sandra Bermann and Susan Stewart, have shown me what true intellectual and academic mentorship can be. Bertrand Marchal, William Bishop, Eileen Reeves, Brigid Doherty, Michael Wood, Leonard Barkan, Michel Murat, and Emily Apter generously engaged with my texts and ideas at crucial points in their development. The gracious hospitality of the École normale supérieure (rue d'Ulm), Bibliothèque nationale de France, Kaisatalo, Kansalliskirjasto, and Arkkitehtitoimisto Pallasmaa made the writing of this work a pleasure; the Department of Comparative Literature at Princeton offered me a home for which I will be forever grateful.

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INTRODUCTION

I. "Voyelles" and their homonyms

"J'inventai la couleur des voyelles !" Arthur Rimbaud declared, dashing off his statement with an emphatic exclamation point. It was the summer of 1873, and Rimbaud, not yet nineteen, had sequestered himself in the attic at Roche, the family farm in Charleville. "*A* noir, *E* blanc, *I* rouge, *O* bleu, *U* vert," he recalled, easing into a more measured tone; "je me flattai d'inventer un verbe poétique accessible, un jour ou l'autre, à tous les sens."[1] And so the excited exclamation cedes to a quieter cynicism, the energy infused into the grand vision's recollection ("J'inventai !") serving only to intensify the bitterness of disillusion ("je me flattai d'inventer…"). It is as if the feat and its failure have collapsed in time, coinciding for one, awful instant in a text indicatively titled *Une saison en enfer*.

Failed as Rimbaud may have perceived his project to "invent the color of vowels" to be, however, few—if any—could be said to have established the notion of the colored vowel more prominently than he. Nearly a century and a half after its composition, the sonnet to which he alludes, "Voyelles" (1871), looms among the most emblematic examples of French symbolist poets' fascination with synesthesia, and the notion of vowel-color correspondence is inextricably bound to the figure of Arthur Rimbaud.[2] This may be one reason why the notion of "the colored

[1] Arthur Rimbaud, "Une saison en enfer," *Oeuvres complètes* ed. André Guyaux and Aurélia Cervoni, Paris: Gallimard, 2009, p. 263.

[2] See, for example, Bertrand Marchal, *Le Symbolisme*, Paris: Armand Colin, 2011, or, in English, *A New History of French Literature* ed. Denis Hollier, Cambridge: Harvard UP, 1989, pp. 789-798. Generally included in this category of texts are, among others, Charles Baudelaire's "Correspondances" (1857), "Richard Wagner et Tannhäuser à Paris" (1861), and *Les paradis artificiels* (1860); J.K. Huysmans' *À rebours* (1884); and Théophile Gautier's "Le club des

vowel" itself remains a highly ambiguous one in literary studies. For the vowels that Rimbaud's sonnet associates with hues possess multiple facets: indeed, the eponymous "voyelles" might well be said to expose the many homonyms coincident in that term.

Rimbaud begins by enumerating the series of vowels that French children learn in school (AEIOU), a series that includes neither all the written vowels of French (which would include Y), nor all the vowels of spoken French (of which there are sixteen); he then inverts the last two vowels of this series in order to evoke the vowels of Ancient Greek, which run from Alpha to Omega, projecting his vowels beyond the confines of the French classroom and into the long history of the writing of vowel sounds (the vowels of Ancient Greek were the first to be committed individually to writing). Concluding with an invocation of the last Greek vowel "—O l'Oméga, rayon violet de Ses Yeux !", Rimbaud confers a sense of completion and totality upon the poem, now running "from Alpha to Omega" in a manner unmistakably evocative, in a Catholic culture, of Revelation I:8 ("I am Alpha and Omega, the beginning and the ending").[3]

But Rimbaud's vowels are graphic shapes, as well. The resemblance between the capital letter A, the outline of a resting housefly, and that of an inverted corset seems to motivate the associative series "A, noir corset velu des mouches éclatantes,"[4] and one suspects that it is not only the undulating form of the sea's waves that suggests the juxtaposition of the letter U with "cycles, vibrements des mers virides," but also the historical similarity between the graphemes U

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hachichins" (1843, 1846). These works are grouped under the general rubric of sound-sight analogy, somewhat imprecisely termed "synesthesia" by the history of literary criticism. As the primary concern of this dissertation is vowel color, rather than sound-color analogy in a general sense, its corpus falls within slightly different lines.

[3] "Revelation 1:8," *The Holy Bible,* King James Version (KJV), www.kingjamesbible.org, accessed 1 August 2017. For a sense of the long history linking vowels to the divine, see Joshua T. Katz, "Gods and Vowels," *Poetic Language and Religion in Greece and Rome* ed. J. Virgilio García and Angel Ruiz, Newcastle upon Tyne: Cambridge Scholars Publishing, 2013, pp. 2-28.

[4] Though note as well the sound /a/ in the word "noir" [nwaʁ].

and V (so prominently alliterated in the "vibrements des mers virides"). The "rire des lèvres belles" associated with the vowel "I," on the other hand, draws upon a brightness common to laughter and vocalic pitch; the "suprême Clairon plein de strideurs étranges" associated with the vowel "O" invites a comparison between the sound of the vowel O and the strange, strident strains of a musical horn. Rimbaud's vowels are shapes as well as sounds: pitches, timbres, voices, and musical tones.

Commentary on Rimbaud's poem has historically struggled against this multiplicity. It is as if, from the perspective of the literary critic, a convincing series of vowel-color correspondences could be conceivable only if it were to attach colors to one of the many vocalic aspects that the text evokes. Endeavoring to relate Rimbaud's color-vowel assignations to any number of organizational models grounded in empirical evidence, from the colored alphabets of children's books to the colored objects of everyday life, the poem's commentators have repeatedly found the sonnet lacking, mechanically reproducing an existing system of correspondences or, more often, failing to do so coherently.[5] One particularly prominent strain of this type of commentary has endeavored to relate Rimbaud's correspondences to the synesthetic vowel-color conjunctions reported by individuals with *audition colorée* (colored hearing), a type of synesthesia.[6] Colored hearing, however—as its name would suggest—is defined as a condition in which particular sounds consistently prompt otherwise inexplicable sensations of color. From

[5] The most prominent example would be René Ghil, *Traité du Verbe,* Paris: Giraud, 1886, pp. 27-8. For a detailed account of the poem's early reception, see Jean-Jacques Lefrère's monumental biography *Arthur Rimbaud*, Paris: Fayard, 2001, pp. 889-891; for a longer view, see René Étiemble, *Le sonnet des voyelles*, Paris: Gallimard, 1968.

[6] For commentary on the difficulty of reconciling Rimbaud's vowel-color correspondences with this research, see Reuven Tsur, "A Reading of Rimbaud's 'Voyelles'," *What Makes Sound Patterns Expressive: The Poetic Mode of Speech Perception*, Durham: Duke University Press, 1992, pp. 111-35; Claude Lévi-Strauss, "Des sons et des couleurs," *Regarde, écouter, lire*, Paris: Plon, 1993, pp. 127-37; and Roman Jakobson and Linda R. Waugh, *The Sound Shape of Language*, The Hague: de Gruyter, 1987, p. 194.

the perspective of the researcher into colored hearing, a vowel-color correspondence may refer only to a correspondence between sound and sight: a correspondence that will never accommodate all the types of vowel-color associations suggested in Rimbaud's sonnet.[7]

But what if the significance of Rimbaud's sonnet were to reside precisely in the complexity of its vowels: entities simultaneously visual, musical, and linguistic in nature? What if the poem's achievement were to lie not in the specific correspondences it draws, nor in those correspondences' relation to vowel-color conjunctions attested in the world, but rather, in its ability to expose the complexity inherent in a vowel? Building each vowel-color association through suggestive, paratactic juxtaposition, the sonnet invites the reader to discern the relationship its syntax withholds; the complexity inherent in the notion of a "vowel" is thus made manifest to any who endeavor to discern the logic by which the poem proceeds. Rimbaud's sonnet, read thus, is less a prescriptive declaration than a study of vowels in all their richness: a verbal prism crafted to expose the many aspects of a vowel.

Following the model of reading proposed by Rimbaud's sonnet, this dissertation investigates how notions of color are associated with vowels in four late nineteenth-century texts: Hermann von Helmholtz's *Die Lehre Von Den Tonempfindungen Als Physiologische Grundlage Fur Die Theorie Der Musik* (1863), Paul Verlaine's "Art poétique" (1874), Stéphane Mallarmé's "Crise de vers" (1895), and Ferdinand de Saussure's "Réponse à une enquête sur

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[7] The other longstanding strand of commentary on the poem rejects the possibility of a serious reading and characterizes the sonnet as a farce: for Anatole France, it is but "un amusement sur l'alphabet," "une fantaisie qui ne fur prise au sérieux par personne" ("Courrier de Paris," *L'Univers illustré* 1914 [28 Nov 1891]: 577); for Richard Sieburth, it is a snide satire of Baudelaire's "Correspondances" ("The Music of the Future," *A New History of French Literature* ed. Denis Hollier, Cambridge: Harvard UP, 1989, pp. 789-798). For these readers, the poem's apparent inability to withstand serious analysis is excused by the fact that it was never intended to be taken seriously in the first place. The joke, in the end, is on the earnest reader who failed to notice that Rimbaud simply "se moquait du public" (M. Daubresse, "Sur l'audition colorée," *Revue Philosophique de la France et de l'Étranger*, 49 [1900]: 304).

l'audition colorée" (1892). Through close readings of these works, I examine the emergence of the notion of vowel-color correspondence as it took shape in Western Europe in the latter half of the nineteenth century. For despite Rimbaud's claim, the colored vowel was not precisely his invention—though it was, it would seem, an invention of the nineteenth century.

II. The Emergence of Colored Vowels

The history of synesthesia as it stands today attributes the first account of a vowel-color correspondence not to the French poet Arthur Rimbaud, but to the Bavarian medical student Georg Tobias Ludwig Sachs.[8] In his doctoral dissertation of 1812, Sachs observes that "[t]here is much that […] does not belong to the sense of vision," which in himself prompts "dark ideas of different colors" (*colorum quorundam obscura repraesentatio*). These "dark ideas of different colors" accompany many stimuli: not just "the intervals of the musical scale" (*intervalla scalae musicae*) and "the timbres of musical instruments" (*instrumentorumque musicorum voces*) but also "the letters of the alphabet" (*literae alphabeti*).[9] Sachs himself, being albino, suspects that his color sensations may bear some connection to this exceptional condition, but he is far from convinced that such sensations affect albinos alone. "I do not doubt at all that these features also express themselves and can be described in other humans," Sachs remarks, adding that "I have recently found a trace of it in a very famous man." Nonetheless, not knowing "anybody who

[8] Sachs is cited as the first case of synesthesia writ large in Jörg Jewanski, Sean A. Day, and Jamie Ward, "A Colorful Albino: The First Documented Case of Synaesthesia, by Georg Tobias Ludwig Sachs in 1812," *Journal of the History of the Neurosciences* 18.3 (2009): 293 - 396; Jörg Jewanski, Julia Simner, Sean A. Day, and Jamie Ward, "The Development of a Scientific Understanding of Synesthesia from Early Case Studies (1849–1873)," *Journal of the History of the Neurosciences: Basic and Clinical Perspectives* 20.4 (2011): 284-305; and Kevin Dann, *Bright Colors Falsely Seen*, Cambridge: MIT Press, 1998, p. 18. In his classic article "On colored-hearing synesthesia: Cross-modal translations of sensory dimensions," Lawrence E. Marks makes the more modest claim that Sachs represents the first case of linguistic colored hearing (*Psychological Bulletin* 82 [1975]: 303-31). For the purposes of this dissertation, Marks' claim will suffice. For a discussion of the controversial status of cases prior to Sachs, see Jewanski et al. 2009: 294-6 ("Possible Documented Cases of Synaesthesia Prior to 1812"). None of these cases, nor indeed any other that I have come across, involves language.

[9] G.L. T. Sachs, *Historiae naturalis duorum leucaetiopum,* PhD dissertation, Universität Erlangen, 1812, pp. 81-2. I quote from page 297 of the partial English translation available in Jörg Jewanski et al. 2009: 293-303.

would so certainly and exactly have noticed such a thing,"[10] he proceeds to record his own correspondences in a text now recognized as the first attestation of linguistic synesthesia in Europe: "*A* and *E* are vermilion, *A* however is more cinnabar, E is more inclined to rose; *I* is white; *O* orange; *U* black; *Ue (ü)* gray […]."[11]

The human association of colors with sounds was nothing new, to be sure: thinkers from Boethius to Newton and Locke had suggested relations between musical and colored tones.[12] But Sachs staked a distinctly different claim: that particular colors corresponded not just to musical sounds, but also to "the letters of the alphabet."[13] Even more curious than the historical novelty Sachs's account would appear to present is the rapidity with which others began to report similar sensations. Over the course of the nineteenth century, colored hearing would spark the interest of physiologists, psychologists, and writers alike, growing from an oddity of dubious credibility into a significant intellectual preoccupation that reached its apex in the 1890s. Identified as a stimulus for synesthetic sensations, the nineteenth-century European vowel suddenly appeared to boast properties never identified with it before.

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[10] Sachs 1812: 81; Jewanski et al. 2009: 297.

[11] "*A* et *E* sunt colore miniato, A tamen in cinnabarinum, E in roseum potius inclinat; I album est; *O* aurantiacum; *U* nigrum; *Ue* (ü) canum" (Sachs 1812: 82; Jewanski et al. 2009: 297; I follow Sachs' inconsistent italicization).

[12] The most frequent examples are Locke's blind man in the *Essay Concerning Human Understanding* (1690), who reports the sound of a trumpet as "red"; Newton's analogy of the musical and spectral chromatic scales in the *Opticks* (1704); and Castel's colored harpsichord (1725). Overviews of the history of colored hearing are offered from a scientific standpoint in Marks, "On colored-hearing synesthesia," and Dann, *Bright Colors*, pp. 18-26; for a humanist perspective, see John Gage's "The Sound of Colour" (*Colour and Culture*, London: Thames & Hudson, 1993, pp. 227-36) and "Making Sense of Colour" (*Color and Meaning*, Berkeley: UC Berkeley Press, 1999, pp. 261-8).

[13] Although his reference to "the alphabet" would seem to suggest "letters" in the sense of "graphemes," his specification "*Ue* (ü)" introduces considerable uncertainty as to the precise status of the vowels Sachs describes.

But whence might the notion of vowel-color correspondence derive, and why did it emerge so dramatically in the latter half of the nineteenth century? In literary studies, the answer to this question has traditionally been: science. Beginning not with Sachs, but with Rimbaud, literary criticism of the symbolist period typically understands "Voyelles" as an imaginative flight that takes the scientific study of synesthesia as its springboard. On closer inspection, however, the argument that Rimbaud's sonnet draws its inspiration from scientific surveys proves difficult to maintain. Although early readers of the poem often asserted that Rimbaud was aware of psychological research into colored hearing,[14] the chronology known to contemporary scholars suggests that this assertion is based on an erroneous understanding of the poem's date of composition in relation to the development of the scientific research. Rimbaud's poem, although not published until 1883, was composed in the autumn of 1871,[15] well before the widespread circulation of scientific surveys was underway. While Sachs's 1812 dissertation may now be cited as the founding document of the field, publication records indicate that research into colored hearing did not begin in earnest until the mid-to-late 1880s.

Indeed, a close look at the scientific publications would suggest that the vectors of influence may have run in the opposite direction. In his study *Bright Colors Falsely Seen, Synesthesia and the Search for Transcendental Knowledge*, Kevin Dann observes that "whereas from 1870 to 1883, there had been an average of three papers per year devoted to research on audition colorée, in the year following the publication of 'Voyelles,' sixteen papers were

[14] See, for example, Gustave Kahn's influential assertion that "Sans doute Rimbaud était au courant des phénomènes d'audition colorée" ("Arthur Rimbaud," *La revue blanche* 16 (1898): 596.

[15] Arthur Rimbaud, *Oeuvres complètes facsimiles,* ed. Steve Murphy, Paris: Champion 2002, pp. 543-4. The poem first appeared in the October 5, 1883 issue of *Lutèce.*

published."[16] By 1890, when Ferdinand Suárez de Mendoza published the first book-length study of the phenomenon in France, there were just under 50 studies to cite,[17] and within three years that number had risen above 85.[18] The marked rise in research into colored hearing in the years following the publication of Rimbaud's sonnet does not, of course, establish a relationship of causality. But the chronology does suggest it is extremely unlikely that Rimbaud drew his inspiration from scientific research.

The question of whence the notion of vowel-color correspondence derives, therefore, remains unanswered, as does the question of why it emerged so dramatically in the late nineteenth century. The ways in which vowels appeared to be "colored," of course, are multiple, as attested by both Rimbaud's sonnet and the annals of the nascent science of synesthesia.[19] Many of these, failing to meet the criteria that scientific study eventually established, have fallen by the wayside, lingering only as counter-examples by means of which the proper object of study may be distinguished. This dissertation, tracing the emergence of the notion of vowel-color

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[16] Dann, *Bright Colors*, p. 31.
[17] Paris: Octave Doin, 1890.
[18] Ferdinand Suárez de Mendoza, *L'audition colorée: Études sur les fausses sensations secondaires physiologiques et particulièrement sur les pseudo-sensations de couleurs associées aux perceptions objectives des sons*, Paris: Octave Doin, 1890; Théodore Flournoy, *Des phénomènes de synopsie*, Geneva and Paris: Eggiman and Alcan, 1893. The wealth of scientific material on colored hearing published after 1890 could certainly be attributed to a decision by the Congrès International de psychologie physiologique to establish a committee dedicated to the the systematic study of colored hearing (See Théodule Ribot and Léon Marillier, *Congrès International de psychologie physiologique*: *première session*, Paris: Bureau des revues, 1890). The sharp rise in interest preceding that meeting, however, bears no obvious explanation.
[19] To read the scientific publications of the 1890s is to watch the researchers in the field struggle to distinguish stable categories of "synopsie," "chromesthésie," "pseudo-chromesthésie," "audition colorée," "synesthésie," and so on. For some indication of the difficulties of classification and taxonomy in French, see Ferdinand Suarez de Mendoza's *L'audition* colorée (1890) and Théodore Flournoy's *Phénomènes de synopsie* (1893); for German, see Eugen Bleuler and Karl Lehmann, *Zwangsmässige Lichtempfindungen durch Schall und verwandte Ersheinungen auf dem Gebiete der anderen Sinnesempfindungen* (Leipzig: Fues Verlag, 1881); for English, William O. Krohn's "Pseudo-Chromesthesia, or the Association of Colors with Words, Letters and Sounds," *The American Journal of Psychology* 5.1 (1892): 20-41.

correspondence, rather than seeking to distinguish and define a medical condition, considers accounts of vowel colors that the modern study of synesthesia is obliged to cast aside. Reading each text on its own terms, and within its own field of knowledge, I seek to demonstrate how the vowel colors that emerge independently in disparate disciplines are mutually illuminating. Taken together, they bear witness to a subtle but decided shift in linguistic perception in the late nineteenth-century: a shift emblematically realized in France in the decline of the metrical line and the emergence of vocalic color.

III. Meter and Line, Color and Rhyme

Although scholars have long been aware that a sharp rise in interest in colored hearing coincided with the decline of meter in French verse, previous studies have tended to consider the two developments as merely coincidental. Poetic accounts of vowel colors are dismissed as mere metaphor or fanciful misunderstandings of science, and meter's decline is charted against graphic conceptions of poetry.[20] Even those critics who maintain that poetry continued an aural tradition after abandoning metrical form tend to locate poetic continuity in a principle of phonological segmentation, retaining rhythmic units despite the loss of the metrical line. Other aspects of verse, such as rhyme, are treated as incidental rather than defining features of poetry.[21]

But as many a poet of the period points out, it is far from clear that rhyme is merely incidental to French verse in the late nineteenth century. In the adamant words of Paul Verlaine,

> Notre langue si peu accentuée ne saurait admettre le vers blanc, et ni Voltaire, vice-roi de Prusse en son temps, ni Louis Bonaparte, roi de Hollande au sien, ne me sont des autorités suffisantes pour hésiter, fût-ce un instant, à ne me point départir de ce principe absolu. Rimez

[20] Giorgio Agamben's identification of Stéphane Mallarmé's "Un coup de Dés jamais n'abolira le Hasard" as the moment at which "French poetry definitively turns its back on the metrical tradition" and poetry announces itself "as something essentially graphic" may be taken as generally indicative (Giorgio Agamben, *The End of the Poem* trans. Daniel Heller-Roazen, Stanford: Stanford University Press, 1999, pp. 99 and 33); for a more nuanced account of free verse as a poetic transition from an aural art to a spatially conceived one, see Laurent Jenny, *La fin de l'intériorité,* Paris: PUF, 2002. A recent development in this vein is historian of science Robert Michael Brain's argument that the *vers libristes*' graphic conceptions of poetry reflect their exposure to recording devices' graphic renderings of the speaking voice ("Liberating Verse," *The Pulse of Modernism*, Seattle: University of Washington Press, 2015, pp. 150-73).

[21] See Jacques Roubaud, *La vieillesse d'alexandre*, Paris: Ramsay, 1978; Clive Scott, *Vers Libre : The Emergence of Free Verse in France 1886-1914*, Oxford: OUP, 1990; and Michel Murat, *Le vers libre,* Paris: Champion, 2008. In Murat's account, the defining feature of *vers libre* is an elusive, non-syntactic segmentation irreducible to the return break yet coincident with it; rhyme is the crucial feature distinguishing symbolist from modernist free verse. Even in symbolist free verse, however, rhyme does not define the line by Murat's account (see Michel Murat, "Le vers libre rimé," *Poétique de la Rime,* Paris: Champion, 2005, pp. 381-411).

> faiblement, assonez si vous voulez, mais rimez ou assonez, pas de vers français sans cela.[22]

Admitting weak rhyme and assonance, Verlaine insists on nothing more than a line-final matching of vowel timbres; without these, the poet staunchly declares, there is "no French verse." Due to its lack of lexical accent, the French language—unlike, for example, English—cannot sustain "le vers blanc" (homonymic, in French, with "white verse"): verse that maintains a metrical structure but omits any line-final matching of vowel sounds. "Le vers blanc," a technical term for an absence of timbral structure in verse, points us to yet another type of colored vowel, and a wealth of poetic language that discusses vowel timbre in terms of brightness and hue.

While in Verlaine's account (though not, it bears noting, in his verse) timbral structure is unproblematically coincident with the end of the metrical line, the play of timbres often seems to rival the metrical order of the line. Writing, almost certainly, of Paul Verlaine, Stéphane Mallarmé notes,

> Les fidèles à l'alexandrin, notre hexamètre, desserrent intérieurement ce mécanisme rigide et puéril de sa mesure; l'oreille, affranchie d'un compteur factice, connaît une jouissance à discerner, seule, toutes les combinaisons possibles, entre eux, de douze timbres.[23]

Liberated from a "gratuitous inner counter," the ear awakes to the pleasurable sensation of timbral play; the easing of metrical stricture enables the perception of "all the possible combinations and permutations of twelve timbres." These timbres, in Mallarmé as in Verlaine, are articulated in terms of visual properties. In lines that are among the best known in "Crise de

[22] Paul Verlaine, "Un mot sur la rime," *Le Décadent* 3.6 and 3.7 (March 1888); rpt. in *Oeuvres en prose complètes* ed. Jacques Borel, Paris: Gallimard, 1972, p. 697.
[23] Stéphane Mallarmé, "Crise de vers," *Oeuvres complètes* ed. Bertrand Marchal, Vol. II, Paris: Gallimard, 2003, p. 206.

vers" (1895), Mallarmé laments that the brightness and coloring of these timbres sometimes fail to match the meanings of the words in which they occur:

> … mon sens regrette que le discours défaille à exprimer les objets par des touches y répondant en coloris ou en allure, lesquelles existent dans l'instrument de la voix, parmi les langages et quelquefois chez un. À côté d'*ombre*, opaque, *ténèbres* se fonce peu ; quelle déception, devant la perversité conférant à *jour* comme à *nuit*, contradictoirement, des timbres obscur ici, là clair. Le souhait d'un terme de splendeur brillant, ou qu'il s'éteigne, inverse ; quant à des alternatives lumineuses simples — *Seulement*, sachons *n'existerait pas le vers* : lui, philosophiquement rémunère le défaut des langues, complément supérieur.[24]

Equating the "coloring" and "brightness" of vowel timbres with the brightness of day and the darkness of night, Mallarmé suggests a phenomenal similarity between linguistic sounds and the degrees of brightness one sees seen in the world. Verse thus emerges as the site at which those elements come into perfect alignment; the mis-alignment of vowel and referential brightness is suggested to be the condition of possibility of verse. Focusing particularly on the role of vowel timbre, traced through the colored rhetoric in which it appears, the dissertation brings out the relationship between the decline of the metrical line and the renewed, if not entirely new perception of vocalic timbre, "color," and "hue."

[24] Ibid., p. 208.

IV. Overview of the Dissertation

Chapter I, "The Proper Tone: Helmholtz's *Klangfarbe der Vokale*," examines Hermann von Helmholtz's inclusion of "the vowel sounds" in his landmark study of affective tone in music. The 1863 text is best known for its groundbreaking articulation of the structure of musical timbre—'sound-color' in the Prussian physicist's neologism, *Klangfarbe*—which is defined as the aspect of sound by which one recognizes the instrument of that sound's production. Less remarked upon is Helmholtz's simultaneous articulation of the structure of vowel timbre in terms of musical harmonics, a feat enabled by his novel approach of considering vowels as musical rather than linguistic sounds. Demonstrating that vowels may be rendered in musical terms, Helmholtz elucidates one perspective from which the passage from musical to linguistic colored hearing appears intuitive. Yet Helmholtz's study also exposes a crucial threshold between the sounds of music and the sounds of vowels: in order to perceive the second, one must lose consciousness of the first. Although the vowel sounds may well be treated as musical ones from the perspective of physical acoustics, the human perception of a vowel sound as language seems to require a loss of consciousness of its musical composition.

Chapter II, "*Pas la Couleur, rien que la nuance !* : Verlaine's Vowels," considers the constitutive role of vowel timbre in rhyme, offering a reading of Paul Verlaine's injunction "Pas la Couleur, rien que la nuance !" in "Art poétique" (1874) as a response to Rimbaud's colored "Voyelles" (1871). Despite the canonical status of both texts as emblematic of symbolist aesthetics, and the well-known biographical connection between the two poets in the period of 1870 to 74, studies of the two poems' intertextual relations are almost entirely lacking. I consider both poems in relationship to Théodore de Banville's *Petit traité de poésie française* (1871),

sketching out the three poets' positions in a formal debate over the role of vowel timbre—or, to use their term, "color"—in French verse. Demonstrating the realization of Verlaine's aesthetic of "nuance" in both his weakening of the caesura and his particular use of rhyme, I bring out the relationship between the perception of meter and the perception of vowel color, or nuance, in Verlaine's verse.

Chapter Three, "*Chimère, y avoir pensé atteste* : Mallarmé and the Tension of Timbre," reconsiders the "crisis of verse" Mallarmé chronicles in his famous essay by examining the role of vowel timbre. Through close readings of "La Musique et les Lettres" (1894) and "Crise de vers" (1895), I demonstrate that, for Mallarmé, the dissolution of meter does not coincide with the end of verse, whose defining feature is a tension between language and a "supreme language." This supreme language, in which sound and sense coincide in perfect unity, may be realized in the metrical line, but it can also be glimpsed through the artful play of vowel timbre. In Mallarmé's account, vowel timbres possess inherent visual properties that may be opposed to the lexical sense of the words in which they appear. The tension installed in language through these mis-matched timbres suffices to awaken us to the idea of a correct alignment: the idea, in other words, of a "supreme language."

Chapter Four, "*L'être imaginaire* : On Saussure's Synesthesia" investigates Ferdinand de Saussure's response to a survey concerning the colors of vowels (1892), finding that the color sensations he reports correspond to phonetic properties of vowel sounds. I demonstrate that Saussure's observations concerning vowel colors may be profitably considered from the perspective of diachronic linguistics, a perspective from which it is possible to see their striking similarity to the *teintes* ("hues," Saussure's word for vowel timbre) that characterize particular

vowels in Saussure's study of the primitive vowel system of the Indo-European languages (the *Mémoire sur le système primitif des voyelles dans les langues indo-européennes* of 1879).

The dissertation concludes by considering Roman Jakobson's argument that synesthetic conjunctions between linguistic sounds and visual sensations form the condition of possibility for sound symbolism, a hallmark of poetic art (1958). Tracing the origins of this position back to *Kindersprache, Aphasie und Allgemeine Lautgesetze* (1941), I present Jakobson's provocative hypothesis that synesthetic sound-color correspondences might be integral to the process of speech acquisition, and therefore common to all in the last stages of infancy. Lingering overtly only in cases of pronounced colored hearing, these correspondences are forgotten by most, returning to consciousness only when prompted by sound symbolism.

CHAPTER ONE

The Proper Tone: Hermann von Helmholtz's *Klangfarben der Vokale*

I. Overtones

Every homogenous substance that resumes its shape after gentle impact may be said to possess a proper tone. Strike a glass, for example, and it will ring with a particular sound, consistent and distinct from that of the silver or the porcelain plate. The sound may be altered, to a degree, by a change in the striking instrument, point of incidence, or nature of impact, as well as the quantity of liquid rippling in the glass. A rap on a near-empty globe will, as everyone knows, ring out over the dull clink of an over-filled chalice. The proper tone of a given glass thus admits of a number of sounds: variable in pitch and volume, subject to the accidents of the moment. But, while a stricken glass may indeed produce a multiplicity of sounds, there is only one pitch that, when sung into its cup, will bring the glass to ring. And varied as the tones borne of the stricken glass may be, a consistency nonetheless asserts itself amongst them, too: for human beings will link them all, and no others, directly back to the object of their making. Sight unseen, they will know the instrument of the sounds' production, bearing witness to an aspect shared amongst all its tones. The sonic affinities of silent things compose a hidden realm best known to the makers of musical instruments, but their general principle is familiar to all.

This general principle, readily intuited by the untrained ear, has proven less evident in the absence of that organ. A riddle of centuries, the question of just how the tone of one sounding body differs from that of the next bears a considerable history of intellectual inquiry. This inquiry reached a pivotal turning point in the mid-nineteenth century, when the Prussian

polymath Hermann von Helmholtz proposed that its answer lay not in the nature of the sounding body—as so many of his predecessors had supposed—but rather in the nature of the sound waves it produced.

Helmholtz's argument emerged as part of a larger inquiry into the physical and physiological processes involved in the human perception of music. A physician by training, and professor of physiology and anatomy at the University of Bonn at the time, Helmholtz was dissatisfied with the gap he perceived between the mathematical study of music, on the one hand, and the physical and physiological study of acoustics, on the other.[25] For while the mathematical ratios of the musical consonances had been known to the former since the time of Pythagoras, the mechanism by which these ratios were perceived by the ear remained entirely obscure. "Musicians, as well as philosophers and physicists," Helmholtz remarked, "have generally contented themselves with saying, in effect, that human minds were in some unknown manner constituted so as to elicit the numerical relations of the vibrations of tones, and have a peculiar pleasure in contemplating simple and readily comprehensible ratios."[26] Determined to elucidate the means by which mathematical ratio passed into the "particular pleasure" of consonant sounds, Helmholtz embarked upon a study of unprecedented scope, investigating not only the nature of musical sound and its propagation, but also the nature of that sound's perception within the human ear.[27] Though the physiological portion of his work fell subject to revision not long

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[25] Hermann von Helmholtz, *Die Lehre von den Tonempfindungen als Physiologische Grundlage für die Theorie der Musik*, Braunschweig: Vieweg & Sohn, [1863]1913, p. 1. Trans. Alexander J. Ellis, *On the Sensations of Tone as a Physiological Basis for the Theory of Music*, New York: Dover, [1870] 1954, p. 1. Translations modified throughout.

[26] Helmholtz, 1913: 2; Ellis 1954: 2.

[27] For a fuller account of the novelty Helmholtz's approach presented within the mathematical study of music, see Patrice Bailhache, *Une histoire de l'acoustique musicale*, Paris: CNRS, 2001. For a more skeptical reading of the success Helmholtz's work in acoustics achieved, see

after its publication, the re-orientation its inclusion necessitated positioned Helmholtz to achieve a number of major insights into the nature of musical sound. And so, paradoxically, it is on the strength of its acoustical, rather than physiological, analysis, that the physician's landmark study *On the Sensations of Tone as a Physiological Basis for the Theory of Music* (*Die Lehre von den Tonempfindungen als Physiologische Grundlage für die Theorie der Musik*, 1863) retains pride of place within the study of musical sound.

The work, as its title indicates, investigates the aural experience of music via "sensations of tone" (*Tonempfindungen*). Helmholtz defines the scope of these sensations explicitly at the start of his work. He delimits them first not by any property inherent in the external stimuli, but rather by the sense organ of their detection: the ear.[28] Of the "sensations of sound" (*Schallempfindungen*) thus described, Helmholtz brings forth a further distinction between "musical sounds" (*musikalische Klänge*) and "noise" (*Geräusch*).[29] This division, in contrast to the first, resides upon the nature of the stimulus: 'musical sounds' comprise those sounds resulting from periodic motion of the air; 'noise,' those resulting from non-periodic motion. Consequently, this division also differs from the first in that it is not absolute. Unlike taste and

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Benjamin Steege, *Helmholtz and the Modern Listener*, Cambridge: Cambridge University Press, 2012.

[28] "The sensation of sound is therefore a species of reaction against external stimulus, peculiar to the ear, and excitable in no other organ of the body, and is completely distinct from the sensation of any other sense" (Ellis 1954: 7). "Schallempfindung ist also die dem Ohr eigentümliche Reaktionsweise gegen äußere Reizmittel, sie kann in keinem anderen Organe des Körpers hervorgebracht werden, und unterscheidet sich durchaus von allen Empfindungen aller übringen Sinne" (Helmholtz 1913: 13).

[29] "Der erste und Hauptunterschied verschiedenen Schalles, den unser Ohr auffindet, ist der unterschied zwischen Geräuschen und musikalischen Klängen. Das Sausen, Heulen und Zischen des Windes, das Plätschern des Wassers, das Rollen und Rasseln eines Wagens sind Beispiele der ersten Art, die Klänge sämtlicher musikalischen Instrumente Beispiele der zweiten Art des Schalles. Zwar können Geräusche und Klänge in mannigfach wechselnden Verhältnissen sich vermischen und durch Zwischenstufen ineinander übergehen, ihre Extreme sind aber weit von einander getrennt" (Helmholtz 1913: 14).

sound sensations, whose clear separation is guaranteed by the discrete sense organs integral to their definition, noises and musical tones "may certainly intermingle in very various degrees, and pass insensibly into one another." One may create noise by compounding multiple musical sounds, "as, for example, by simultaneously striking all the keys contained in one or two octaves of a pianoforte."[30] And, as musical sounds may be compounded to create noise, they must be "the simpler and more regular elements of the sensations of hearing," and hence the evident starting point for Helmholtz's inquiry.[31]

Though the category of sound Helmholtz identifies as his subject is introduced as "musical sounds" (*musikalische Klänge*), the modifier "*musikalische*" curiously disappears almost immediately. But one sentence after introducing the category, Helmholtz offers "the sounds of musical instruments" as examples not of "*musikalische Klänge*" but merely "*Klänge*," proceeding to the opposition from which the chapter, "*Geräusch und Klänge*," derives its name. The text offers little room for doubt that the term *Klänge* is to be understood as *musikalische Klänge*; indeed, the English translator Alexander Ellis implicitly argues as much in his decision to translate *Klänge* systematically as "musical tones."[32] Yet Helmholtz's fleeting introductory modifier "musical" is worth pausing to note. Its presence would appear to attest to its absence, or at least potential absence, from *Klänge*—and thus to acknowledge the possibility of non-musical

[30] Ellis 1954: 7-8.
[31] "In der Tat kann man Geräusche aus musikalischen Klängen zusammensetzen, wenn man z.B. sämtliche Tasten eines Klaviers innerhalb der Breite von einer oder zwei Oktaven gleichzeitig anschlägt. Hiernach ist es klar, daß die musikalischen Klänge die einfacheren und regelmäßigeren Elemente der Gehörempfindungen sind, und daß wir an ihnen zunächst die Gesetze und Eigentümlichkeiten dieser Empfindungen zu studieren haben" (Helmholtz 1913: 14).
[32] See Helmholtz 1913: 37-9 and Ellis 1954: 23-4. Ellis's decision to use "musical tones" over "musical sounds" probably derives from a desire to distinguish *Klänge* from *Schall*, and to stress the nature of a *Klang* as the product of a single source, rather than the conbined sound of several instruments. The shift, however, is not without complications.

Klänge. As the schema Helmholtz presents can admit of no such category, the ambiguity lurking in the language must be explicitly cast out. Yet the implicit question imposes itself: what might such non-musical *Klänge* be, and can they indeed be so easily banished from an inquiry into sensations of tone?

The term "tone" (*Ton*) itself emerges in reference to a specialized category of *Klänge* : a "tone" is a musical sound resulting from aerial vibrations strictly pendular in nature.[33] To clarify this distinction, Helmholtz offers an illustration. Taking a taut string fixed at both ends, he notes that such a string "may be first made to vibrate as in fig. 17a, so that its appearance when displaced from its position of rest is always that of a simple half wave."

FIG. 17.



[34]

Availing itself of the greatest possible distance from its position of rest, the string moves back and forth across this central axis, accelerating as it approaches center and slowing as it stretches to the outer reaches of its curve. Its motion, Helmholtz explains, is precisely like that of a pendulum, which accelerates to its greatest speed just as it swoops through the lowest portion of its arc. Carried out at a speed we perceive as vibration, this pendular motion, in the string, "gives

[33] This definition originates not with Helmholtz, but with G.S. Ohm, the first to offer the mathematical equation of a single tone as a simple sine curve. See Ohm, "Ueber die Definition des Tons, nebst daran geknüpfter Theorie der Sirene und ähnlicher tonbildener Vorrichtungen," *Poggendorffs Annalen der Physik* LIX (1843): 513-565 and "Noch ein Paar Worte über die Definition des Tons," *Poggendorffs Annalen der Physik* LXII (1844): 1-17.

[34] "Eine Saite kann zunächst so in Schwingung gesetzt werden, wie fig. 17 zeigt, daß ihre Form bei der Entfernung aus der Gleichgewichtslage stets der Form einer halben einfachen Welle gleich ist" (Helmholtz 1913: 77-8; Ellis 1954: 46).

just one tone, the deepest it can produce."[35] Born of a single sounding body set in pendular motion, a 'tone' definitionally corresponds to a single pitch (*Tonhöhe*), the pitch of a musical sound having long been known to reside upon the frequency of its periodic motion.[36] The application of the term *Tonhöhe*, however, remains distinct from that of *Ton*, marking but one aspect of a sound of which a great deal more might be said.

It had been observed at least as early as 1701, by the French mathematician Joseph Sauver, that the movement of an open string could involve a number of different arcs beyond this basic one.[37] It had also been observed, and indeed far earlier, that the seemingly singular sound produced by a sonorous string belay a number of subtler, but indissociable sounds.[38] But it was not until Helmholtz's 1863 study that the arcs Sauver had identified were demonstrated to exist concurrently within one and the same string, giving rise to multiple simultaneous sounds of discrete and verifiable pitches.

Helmholtz's account was enabled by two nineteenth-century developments in the realms of physics and mathematics: G.S. Ohm's aforementioned articulation, in 1843, of the mathematical equation characterizing the periodic motion of a musical tone, and Joseph Fourier's elucidation, in the 1820s, of the decomposability of all periodic motion. In the course

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[35] "Die Saite gibt dabei nur einen Ton, und zwar den tiefsten, den sie überhaupt hevorbringen kann" (Helmholtz 1913: 77; Ellis 1954: 45).

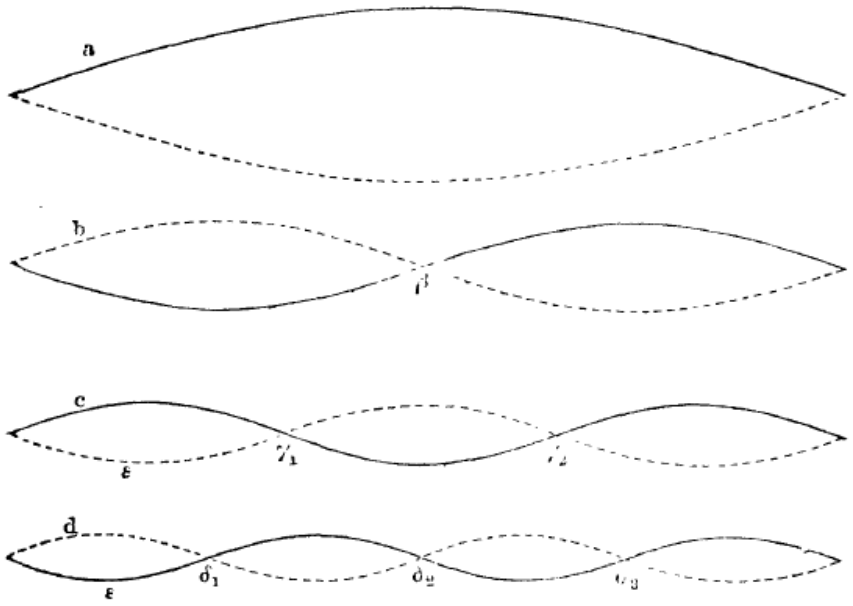
[36] On the development of this calculation from Antiquity through the 17th century, see Bailhache, *Histoire*, pp. 63-6.

[37] Joseph Sauver, *Collected Writings on Musical Acoustics* ed. Rudolf Rasch, Utrecht: Diapason Press, 1984, p. 152. The knowledge that one and the same string can produce tones lying at consonant intervals to the tone corresponding to its full length is, of course, attested as early as Plato. The novelty of Sauver's observations lies in his use of the open string, as opposed to a string artificially held by a moveable bridge, as in the canons and monochords of the ancients (Árpád Szabó, *Anfänge der griechischen Mathematik,* Budapest: Akadémiai Kiadó, 1969, pp. 128-34; see also Bailhache, *Histoire*, pp. 13-39, 104-5, and 144-7).

[38] See, for example, Nicole Oresme's discussion of "sono apparenti uno ex sonis partialibus mixto" in his *Tractatus de configurationibus qualitatum et motuum*, II.xviii. Trans. Marshall Clagett, Madison: University of Wisconsin Press, 1968, pp. 314-7.

of an investigation into heat propagation, Fourier had uncovered a generalizable principle: that, under a given set of conditions, any periodic function could be decomposed into a series of periodic functions whose frequencies would divide evenly into the fundamental frequency.[39] Such a principle, Helmholtz was quick to perceive, must apply to the periodic motion of musical sound as described by Ohm. Though the mathematical proof behind the "Fourier series" is complex indeed, the motion it describes in music is easily illustrated. One need look no further than Helmholtz's figure 17, rendered here in full:

FIG. 17.



Though the simple movement described in figure 17a is easily transformed, conceptually, into the aerial vibration of a musical tone, anyone who has observed the vibration of sonorous strings knows that their movement is not quite so simple. One is obliged to admit that the simplicity of the pendular account belies a far more unwieldy wiggling. Any additional movement in the string, however, must result from its passing simultaneously through other wave-curves

[39] Bailhache, *Histoire*, pp. 145-7.

commensurate with its total length (such as those in figures 17 b, c, and d): for no string will assume the shape of a curve whose length does not coincide, in some multiple, with its own. All the wave-curves available to the string, then, must represent perfect divisors of the one in figure 17a. Or, in Fourier's terms, the periodic motion depicted in figure 17a must be decomposable into the movement depicted in figures 17b, c, d, and so on. Fourier's theorem thus provided the mathematical basis for Helmholtz's argument that these waves co-exist, simultaneously, within one string.

The proportional relations between these wave-curves can also be conceived in terms entirely independent of the Fourier series, however. Designating the tone produced by the longest wave-curve *a* as the "prime tone" (*Grundton*), Helmholtz demonstrates that "[i]n the vibrational form *b* the string produces only the upper octave of its prime tone, in the form *c* the twelfth, and in the form *d* the second octave."[40] And one may well continue on to the ever higher pitches resulting from the increasingly minute wave-curves of the string. The intervals thus revealed are far from obscure: they are, in order of ascendance, the octave, a perfect fifth beyond that, a perfect fourth beyond that (or, the second octave), another major third up, a minor third up, another minor third up, a whole tone, a whole tone, and another whole tone. [41]

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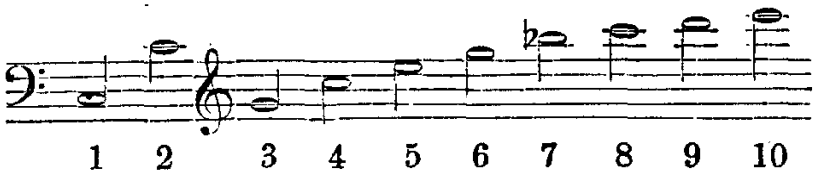
[40] "bei der Schwingungsform *b* läßt die Saite keinen anderen Ton als die höhere Oktave ihres Grundtones hören, bei *c* die Duodezime, bei *d* die zweite Oktave" (Helmholtz 1913: 77; Ellis 1954: 45).

[41] Helmholtz 1913: 37. In introducing the overtones, Helmholtz limits his scale to the first ten overtones, though the upper extension of their production would appear to be theoretically unbounded. Ellis's decision in the English translation (p. 22) to extend Helmholtz's scale to the first sixteen overtones, however, invites the question of whether Helmholtz's limitation to ten is entirely arbitrary. Comparison of the two scales reveals at least one reason why the eleventh overtone was to be avoided: lying at the problematic interval of the semitone, it marks the first rupture in the tonal key described by the first ten tones. As Helmholtz proceeds to identify these first 10 overtones as "harmonic," later to discuss clearly dissonant "Klänge mit unharmonische Obertönen," (Section I.5.ii, pp. 120-7), it would seem that in his usage "harmonisch" and



That these forms of vibration exist simultaneously, undisturbed by one another, may be demonstrated by means of sympathetic resonance (*Phänomen des Mittönens*).[42] A phenomenon already well known to the musicians of Helmholtz's day, sympathetic resonance is easy to observe.[43] When the strings of two violins are tuned to exact unison, and the string of one instrument is bowed, the corresponding string upon the other will begin to vibrate.[44] This is because the aerial vibrations of the first string correspond in wavelength to the prime tone of the second. Hence the latter is easily set in motion by these movements of the air, while the other strings upon the violins, attuned to other wavelengths, remain unmoved. Thus, though such a string can naturally be made to sound many tones, as the violinist's art amply demonstrates, one tone may be identified as most proper to it. For this reason, Helmholtz refers to this tone, and this tone alone, as the string's "proper tone" (*Eigenton*).

By means of sympathetic resonance, Helmholtz contends, the student of sound may visually verify the presence of ambient wavelengths in the air. Raise the lid of a pianoforte,

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"unharmonisch" do not coincide with "consonant" and "dissonant," but rather are distinguished by the appearance of the semitone.

[42] The German physicist August Seebeck appears to have been the first to introduce sympathetic resonance into the physical and mathematical discussion of music ("Theorie des Mittönens," *Repertorium der Physik* Vol. viii, pp. 60-4). Though Helmholtz does not cite his colleague's work directly in his chapter on sympathetic resonance, he does cite it elsewhere in the *Tonempfindungen* (Helmholtz 1877: 625; Ellis 1870: 391); so, it seems likely that Seebeck was indeed his source for much of this material.

[43] "Das Mittönen ist ein den Musikern wohlbekanntes Phänomen" (Helmholtz 1913: 61; Ellis 1954: 36).

[44] "z. B. die Saiten zweier Violinen genau gleich gestimmt sind, und man die eine anstreicht, gerät auch die gleichnamige Saite der anderen Violine in Schwingung." (Helmholtz 1913: 60; Ellis 1954: 36).

Helmholtz urges, and select the note whose presence you wish to ascertain—say, *c'*. Raise the damper on the corresponding string and place a small wood chip upon it. "You will find," Helmholtz writes with assurance, "the chip put in motion, or even thrown off, when certain other strings are struck." The strings that cause the chip to move—"c, F, C, $A_1\flat$, F_1, D or C_1"—are those whose primes correspond to wave-curves evenly divisible by that of *c'*. That the proper tone of *c'* is present in the sounding of any of these notes is evidenced in the movement of the chip. Were it absent, the string would not be set in motion. "We must therefore not hold it to be an illusion of the ear or to be mere imagination," Helmholtz concludes, "when in the musical tone of a single note emanating from a musical instrument, we distinguish many overtones, as I have found musicians inclined to to think, even when they have heard those overtones quite distinctly with their own ears."[45] He summarizes his findings as follows:

> The ear, when its attention has been properly directed to the effect of the vibrations which strike it, does not hear merely that one tone whose pitch is determined by the period of the vibrations in [fig 17a], but in addition to this, it becomes aware of a whole series of higher tones, which we will call the harmonic overtones of the sound [*Klang*], in contradistinction to the prime tone or simply the prime tone, as it may be called, which is the lowest and generally the loudest of all the overtones, and by the pitch of which we judge of the pitch of the sound [*Klang*] itself.[46]

[45] "Wir dürfen es also nicht für eine Täuschung des Ohres oder eine Einbildung erklären, wenn wir in dem Klang einer einzelnen Note irgend eines musikalischen Instrumentes viele Partialtöne unterschieden, wozu ich Musiker, trotzdem sie diese Töne selbst deutlich hörten wohl zuweilen geneigt gefunden habe" (Helmholtz 1913: 82; Ellis 1954: 47-8).

[46] "Das Ohr, von solchen Schwingungen getroffen, hört nämlich bei gehörig angestrengter Aufmerksamkeit nicht nur denjenigen Ton, dessen Tonhöhe durch die Dauer der Schwindungen in der Weise bestimmt ist, wie wir dies vorher auseinander gesetzt haben, sondern es hört außer diesem noch eine ganze Reihe höherer Töne, welche wir die harmonischen Obertöne des Klanges nennen, im Gegensatz zu jenem ersten Ton, dem Grundton, der unter ihnen allen der tiefste und in der Regel auch der stärkste ist, und nach dessen Tonhöhe wir die Tonhöhe des ganzen Klanges beurteilen" (Helmholtz 1913: 37; Ellis 1954: 21-2).

The prime tone borne of any given string is, thus, but one component of the total sound emanating from it: that sound being less a tone than, as another name for its instrument would suggest, a chord.

The implications of Helmholtz's highly specific terminology are worth pausing to consider. Adopting Ohm's sinusoidal equation for a single tone, Helmholtz uses the term *Ton* to designate only those "simple tones" (*einfache Töne*) whose movement corresponds to it: strictly pendular aerial vibrations, to which there corresponds but a single pitch. A tone is thus, in Helmholtz's usage, defined exclusively in accordance with the nature of its sound waves, without reference to the instrument of its production. The singularity of a tone is contingent upon the singularity of its pitch, and not upon a single sounding of a given body. Indeed, a single sounding of any given body is likely to produce not one, but many simultaneous tones.

This definition of a single tone, it bears noting, stands somewhat at odds with the term "tone" itself, whose range of reference has been, and continues to be, very broad, but whose etymology is easily traced. The German *Ton*, like the English *tone*, derives from the Greek τόνος, a term whose earliest attestations reveal it to indicate the musical sound produced of a single agitation of a sounding body. Further, as the Hungarian classicist Árpád Szabó has noted, the Greek *τόνος* shares its root with the verb τείνω (to stretch), an etymological affinity suggesting that, for the Ancients, "tones" were basically conceived as the sounds of stretched strings.[47]

A 'tone,' then, in its earliest and most basic form, appears to have designated the sound of a taut string. With the Pythagoreans, however, the term gained a new application. For while the ancient study of music had long identified the three basic consonances of the fouth, the fifth,

[47] See Szabó, *Anfänge*, pp. 128-34.

and the octave, the minimal interval of a single "tone"—upon which the entire modern terminology is based—played no role in the classical calculations.[48] Its introduction would appear to date from the time of the Pythagoreans, whose calculations require the interval still known as that of one whole "tone", as their terminology attests .[49] This minimal unit has persisted, more or less recognizably, since that time, and remains the basis for the diatonic scale [dia (διά) + tonos (τόνος), or, "proceeding by tones"] of Western music. Neither the unit, the scale, nor the harmonic system is necessary to music, of course; as Helmholtz readily points out,[50] and there is no doubt that the "*Ton*" of the Prussian professor's title refers to the sound waves identified by Ohm and not to the minimal unit identified by the Pythagoreans. Yet, even in Helmholtz's text, the ancient terms persist—the interval of one tone, while not inviolable, is as imperative to the Helmholtzian schema of sound as is the modern measure of pitch. And as the English translator Alexander Ellis notes, despite his best efforts, "Even Prof. Helmholtz himself

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[48] The octave was known as the "diaplasion diastema" (διπλασιον διαστεμα), or "doubled line"; the fourth, known as the "hemilion diastema" (ἡμιόλιον διαστεμα), or "line 1½ [units] in length"; and the fifth, the "epitriton diastema" (ἐπίτριτον διαστεμα), or "line 1⅓ [units] in length." As Szabó explains, the basic unit upon which these measurements are based is that of half a monochord (Szabó, *Anfänge*, pp. 128-34).

[49] In the Pythagorean terminology, the "epitriton diastema" becomes the *diapente* (διάπέντε), literally "through five [tones]" and the "hemilion diastema," the *diatessaron* (διατεσσάρων), or "through four." In the tale related by Boethius, the single tone may be traced to the fourth hammer, which serves only to introduce the dissonant interval by which the diapente and diatesseron differ (Boethius, *Fundamentals of Music*, trans. Calvin M. Bower, New Haven: Yale UP, 1966, pp. 17-9). Szabó also traces the history of the single 'tone' archeologically, noting its presence as a marked notch on the canon as the essential distinction between this instrument and the older monochord (Szabó, *Anfänge*, pp. 128-34).

[50] "The essential basis for Music is *Melody*. Harmony has become essential to Western Europeans during the last three centuries, and to our taste, an indispensable means of strengthening melodic relations, but finely developed music existed for thousands of years and still exists in ultra-European nations, without any harmony at all" (Helmholtz, "Preface to the Third German Edition," trans. Ellis 1954: vii). See also Helmholtz's lecture "'Ueber die arabisch-persische Tonleiter," (*Verhandlungen des naturhistorisch- medizinischen Vereins zu Heidelberg* 2 (1862): 216-7.

has not succeeded in using his word *Ton* consistently for a *simple* tone only."[51] If *Ton* does, as Ellis notes, persist in its ancient meaning, turning up where the compound *Klang* ought to be, one distinction between the two terms nevertheless remains inviolate. The term *Ton* remains, even in its erroneous applications, strictly within the realm of music, while its modern successor, *Klang*, slips into an ambiguous zone of sounds whose musicality is less than clear.

Having demonstrated the existence of the overtones in the sounds of sonorous strings, Helmholtz proceeds to verify their presence in other types of musical sound. He determines not only that many—indeed, most—musical sounds contain overtones, but also that the series of intervals governing their occurrence "is precisely the same for all compound musical tones."[52] Not only strings, in other words, but also bells, flutes, brass horns, and reed instruments, produce singular musical sounds whose powerful prime belies an array of overtones all sounding at the very same, set intervals. Thus the intervals of the overtones composing a musical sound, be they consonant or dissonant, could not be said to arise from the instrument of their production.

What Helmholtz did find the instrument of production to determine, however, was the degree of realization of the overtones in any given instance. In verifying the various overtones present in a sonorous string, for example, Helmholtz finds the tones' upper boundary to be determined by the physical limits of the string at hand. Fine strings will yield a greater number of higher overtones than thicker ones because wave-curves cease to form when the length of string required for their production is "too short and stiff to be capable of sonorous vibration."[53] Thus

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[51] Ellis 1870: 36.

[52] "Die Reihe dieser Obertöne ist für alle musikalischen Klänge […] genau dieselbe" (Helmholtz 1913: 37; Ellis 1954: 22). Not all musical tones are, of course, compound: tuning forks, for example, produce a tone almost entirely bereft of overtones, and those that remain can be more or less eliminated if the fork is struck at the mouth of the proper resonator.

[53] "bis endlich die Stücke der Saite […] zu kurz und steif werden" (Helmholtz 1913: 78-9; Ellis 1954: 46).

"violin and the lower pianoforte strings" will yield about ten overtones, while "extremely fine wires" can easily generate sixteen to twenty.[54] And therein, Helmholtz explains, lies a sonic difference readily perceptible to the human ear, though "in most cases the mathematical analysis of the motions of sound is not nearly far enough advanced to determine with certainty which overtones will be present and what intensity they will possess."[55]

What strings reveal once again elucidates generalizable principles, and Helmholtz proceeds to demonstrate how the physical constitution of various instruments affects the range of overtones they produce, as well as the intensity of those overtones' production. The phenomenon is most readily evident, he suggests, in bells. "The overtones are most easily heard when they are not in harmony with the fundamental tone," Helmholtz explains, "as in the case of bells." For while the first few overtones lie at intervals consonant with the prime as well as one other (the octave, twelfth [a perfect fifth above the octave], and second octave [a perfect fourth above the twelfth]), the intervals of incidence diminish as the overtones ascend, causing the sounds they produce to grow increasingly dissonant. Instruments with fewer, deeper overtones, such as violin and pianoforte strings, will therefore sound more pleasing and unified than instruments generating many higher overtones, such as bells. "The art of the bell-founder," Helmholtz explains, "consists precisely in giving bells such a form that the deeper and stronger overtones shall be in harmony with the fundamental tone, as otherwise the bell would be unmusical,

[54] Helmholtz 1913: 79; Ellis 1954: 46.
[55] "In den meisten anderen Fällen ist die mathematische Analyse der Schallbewegungen noch nicht so weit fortgeschritten, daß wir mit sicherheit angeben könnten, welche Obertöne und wie stark sie da sein müssen" (Helmholtz 1913: 96; Ellis 1954: 55).

tinkling like a kettle. But the higher overtones are always out of harmony, and hence bells are unfitted for artistic music."[56]

The implications of the overtones were thus far from trivial. Accounting for the curiously different forms of the sound waves generated by two bodies sounding at the same pitch with the same volume, the overtones furnished a physical explanation for the ear's ability to identify individual sources of sound. Thus, the Prussian professor concludes, the assumption of physicists that an instrument's sonic stamp lay in the form of a sound's vibration (an assumption, he notes, "hitherto based simply on the fact of our knowing that the quality of the tone could not possibly depend on the periodic time of a vibration, or on its amplitude"[57]) could be considered demonstrated.

It was no small feat. In demonstrating the relationship of the overtones to the differing sounds produced by different instruments, Helmholtz had furnished the first known system of quantification for an exceedingly enigmatic aspect of sound. For the musical sounds Helmholtz knew had, by his own account, been subject to measurement along but two axes: that of pitch and that of volume.[58] A tone's pitch had been demonstrated to depend upon the speed of the

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[56] "Am leichtesten hört man die Obertöne, wenn sie unharmonisch zum Grundton sind, wie bei den Glocken. Die Kunst des Glockengusses besteht namentlich darin, der Glocke eine Form zu geben, bei welcher die tieferen stärksten Nebentöne harmonsich zum Grundtone werden, sonst klingt der Ton unmusikalisch, kesselähnlich; die hoheren bleiben aber immer unharmonisch, und der Glockenton ist deshalb zur künstlerischen Musik nicht geeignet" (Helmholtz, "Die Physiologischen ursachen der musikalischen Harmonie," *Populäre wissenschaftliche Vorträge* Vol. 1, Braunschweig: Vieweg und Sohn, 1865, p. 83. Trans. Alexander Ellis, "On the Physiological Causes of Harmony in Music," in *Popular Lectures on Scientific Subjects* Vol 1., London: Routledge/Thoemmes Press, [1895]1996, p. 82).

[57] "welche sich bisher nur darauf gründete, daß man wußte, die Klangfarbe könne nicht von der Schwingungsdauer und nicht von der Schwingungsbreite oder -stärke abhangen" (Helmholtz 1913: 36; Ellis 1954: 21).

[58] Duration is also frequently noted, but appears to be considered irrelevant to studies of harmony— harmony being the study of simultaneous sounds, and melody, that of successive ones. See, for example, Jean-Philippe Rameau, *Traité de l'harmonie réduite à ses principes*

vibrations it provoked in the air, and its volume could be accounted for in the amplitude of those vibrations. There were a great many aspects of sound, however, of which those two equations offered no account. Evident to all human beings, yet unidentified in terms of physical acoustics, these aspects included the difference between 'smooth' or 'harsh' tones, the distinctions between the various vowel sounds[59], and "that property of sound, by which we know the tone of a violin from that of a flute or of a trumpet."[60] Escaping as they did the systems of quantification known to the study of music, these aspects of sound fell, by default, into an amorphous, axis-less dimension generally referred to as "quality."[61]

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naturels, Paris: Ballard, 1722, p. 2, and James Beattie, "An Essay on Poetry and Musick as they affect the mind" (1762), rpt. in *The Works of James Beattie,* Philadelphia: Hopkins and Earle, 1809, p. 321. That said, it seems worth noting that duration is implied in the notion of speed, from which pitch is demonstrated to derive.

[59] See, for example, Euler, "Eclaircissemens plus détaillés sur la génération et la propagation du son et sur la formation de l'echo" (1764-5): "on sait que les sons, quoiqu'ils soyent également graves ou aigus et aussi également forts, admettent encore plusieurs variations er différences, comme sont celles des différentes voyelles, dont personne n'a encore entrepris d'expliquer la nature" (*Mémoires de l'académie des sciences de Berlin* 21 (1767): 547).

[60] Robert Willis, "On the Vowel Sounds, and on Reed Organ-Pipes," *Transactions of the Cambridge Philosophical Society* 3 (1830): 234.

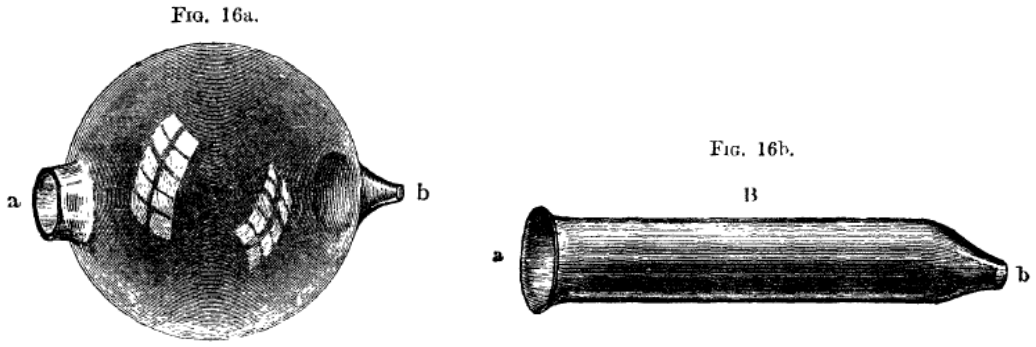
[61] According to Ellis, the most evident and "time-honoured expression" in English prior to his 1875 translation of Helmholtz is "quality of tone," though his lively rejections of the terms "register," "colour," "clangtint," and "timbre," suggest that this claim was not uncontested (Ellis 1954: 24fn). Helmholtz's English sources do employ the term "quality," though often in senses not quite congruent with his (see particularly Willis, p. 234). In French, one encounters "qualité," but also "timbre," as in Rousseau's 1767 *Dictionnaire de musique* : "TIMBRE. On appelle ainsi, par métaphore, cette qualité du son par laquelle il est aigre ou doux, sourd ou éclatant, sec ou moelleux. Les sons doux ont ordinairement peu d'éclat, comme ceux de la flûte et du luth; les sons éclatans sont sujets à l'aigreur comme celle de la vielle ou du hautbois: il y a même des instrumens, tels que le clavecin, qui sont à la fois sourds et aigres; et c'est le plus mauvais *timbre*: le plus beau *timbre* est celui qui réunit la douceur à l'éclat; tel est le *timbre* du violon" (*Oeuvres complètes de J. J Rousseau* tome 7e, Paris: Hachette, 1906, p. 324). "Timbre" used in the more specific sense of "Qualité spécifique d'un son, indépendante de la hauteur, de la durée et de l'intensité, résultant essentiellement du concours des harmoniques qui accompagnent la note fondamentale jouée" appears to date from around 1863—in other words, from the publication of Helmholtz's book ("timbre," *Trésor de la langue française*, http://www.le-tresor-de-la-langue.fr, accessed 16 July 2017).

"Quality," while widely noted, was a vague and heterogeneous notion at best. As Helmholtz observes in his 1863 study, "There has been a general inclination to credit quality with all possible peculiarities of musical tones that were not evidently due to pitch or volume."[62] Pursuing a more precise understanding of this obscure aspect of sound, Helmholtz found that, contrary to the negative conception by which it contained everything not attributable to pitch or volume, it was in fact a function of both. The quality of a sound was determined by, but not reducible to, the pitch of its prime tone; and its particular shading was determined by the degrees of volume the sounding instrument permitted its various overtones. The quality of a sound was not something other than pitch and volume, it was a complex pattern of their relations: pitches realized with varying degrees of force that, like a sonic stamp, marked all musical sounds emanating into the air with the imprint of their instrument. For this quality no longer qualitative, but quantitative in nature, Helmholtz proposed a new name: "*Klangfarbe*."

[62] "[…] man bisher in allgemeinen geneigt war, alle möglichen verschiedenen Eigentümlichkeiten der Klänge, welche nicht gerade den Stärke und Tonhöhe betrafen, der Klangfarbe zuzuschreiben" (Helmholtz 1913: 113-4; Ellis 1954: 66).

II. The Tone of a Breath

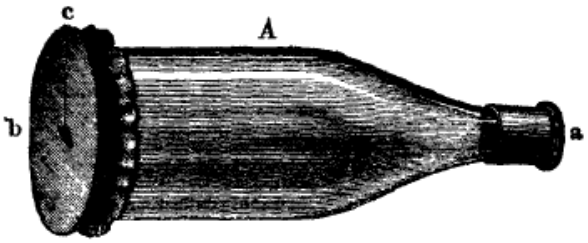
In the course of his investigation, Helmholtz invented a novel device for analyzing musical sound. The "Helmholtz resonator," as it is still known today, consists of a blown glass sphere or metal tube with openings at two opposing points:



The interior dimensions of the resonators are calculated to correspond to a certain wavelength, enabling their instruments to isolate and amplify a particular tone. If one applies such a resonant cavity to one's ear while stopping the other, Helmholtz explains, "most of the tones produced in the surrounding air will be considerably damped; but if the proper tone of the resonator is sounded, it will bray into the ear most powerfully."[63] Resonant cavities had, of course, been used in sound analysis for quite some time, but the Prussian researcher's instruments possessed one crucial difference. Resonators of the past had been open at one end only, and were at the other end affixed with a drum, whose movement, manifested with the bobbling of a bead fixed beside it, would serve to indicate the presence of the cavity's proper tone.

[63] "Hat man sich das eine Ohr verstopft […] und setzt an das andere ein solchen Resonator, so hört man die meisten Töne, welche in der Ungebung hervorgebracht werden, viel gedämpfter als sonst; wird dagegen der Eigenton des Resonators angegeben, so schmettert dieser mit gewaltiger Stärke in das Ohr hinein" (Helmholtz 1913: 74; Ellis 1954: 43).

FIG. 15.



Helmholtz's innovation was to remove this drum, molding the open end of the resonant chamber into a funnel instead. Fitting this funnel into the ear with a bit of soft sealing wax, Helmholtz created a resonator that functioned in much the same way as the prior device, excepting that "the observer's own tympanic membrane has been made to replace the former artificial membrane."[64]

While investigating the upper overtones of reed organ pipes with the aid of such resonators, Helmholtz stumbled upon a curious phenomenon. It could happen, he observed, that the proper tone of the resonator would correspond not to the prime tone played by the instrument, but to one of its overtones, in which case "the corresponding overtone is really more reinforced by the resonance chamber than the prime or other overtones, and consequently predominates extremely over all the other overtones in the series." The resultant sound, Helmholtz observed, has "consequently a peculiar character, and more or less resembles one of the vowels of the human voice."[65]

The finding was not, on the whole, unintuitive. As the English scientist and inventor Robert Willis had observed more than three decades before, "It is agreed on all hands that the constructions of the organs of speech so far resemble a reed organ-pipe, that the sound is generated by a vibratory apparatus in the larynx, answering to the reed, by which the pitch or

[64] Ellis 1870: 68. Benjamin Steege pursues an extended discussion of the subjectivity thus introduced into Helmholtz's research in *Helmholtz and the Modern Listener,* pp. 43-79, and especially 60-8.
[65] "Der Klang bekommt dadurch einen besonderen Charakter, er wird nämlich einem der Vokale der menschlichen Stimme mehr oder weniger ähnlich" (Helmholtz 1913: 168; Ellis 1954: 103).

number of vibrations in a given time is determined."[66] Although the pitch of the voice is determined by the reed-like vocal chords, Willis continues, "this sound is afterwards modified and altered in its quality, by the cavities of the mouth and nose, which answer to the pipe that organ builders attach to the reed for a similar purpose."[67] The basic structure of a vowel as one produced of a reed-like sounding body and a resonant cavity was thus, plain enough, and by all accounts as uncontested as Willis claimed. The nature of the resonant cavity's peculiar effect on the tone of the sounding body, however, had remained a mystery.

Its unraveling had begun at least as early as 1679, when Samuel Reyher, Professor of Mathematics and Law at the University of Kiel, published a brief excursus on vowels in his study of the five books of Moses.[68] Pondering the nature of the language "written by the finger of God" into the tablets at Sinai, Reyher considered an argument recently advanced by his colleague Franciscus Mercurius van Helmont. The "true nature of the vowels," Helmont argued, lay in their divine structure, manifest both in the letters of the Hebrew alphabet and in the human speech organs poised to produce their sounds.[69] Unconvinced by the extravagant contortions of

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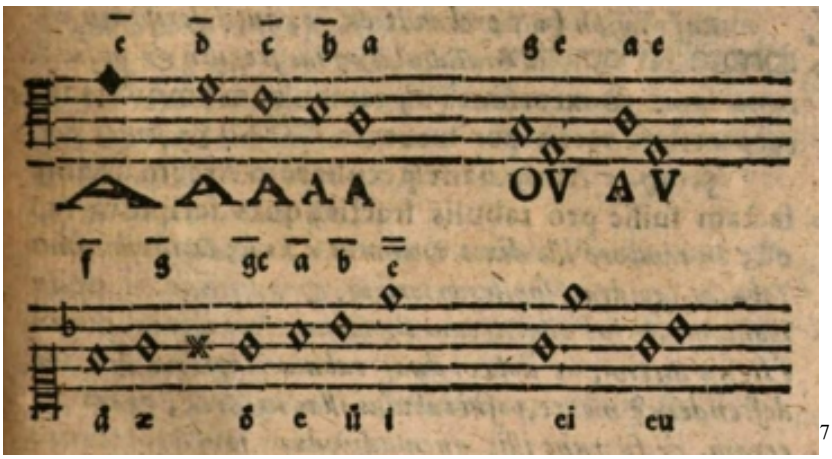
[66] Willis 1830: 235.
[67] Ibid., 235.
[68] Samuel Reyher, *Mathesis Mosaica, sive Loca Pentateuchi Mathematica Mathematicè explicata,* Kiel: Kilia Holsatorum, 1679.
[69] *Alphabeti veri naturalis hebraici brevissima delineatio*, 1667. Helmont took the agreement between these two sets of shapes as conclusive evidence of their shared, divine design. Reyher was less than convinced, however; the tactful mathematician had but to allude to the glaring difficulty of Helmont's theory: namely, that the vowel notation considered therein had appeared in written Hebrew no less than a millennium after even the latest plausible dates put forth for the life of Moses (Reyher 1679: 432). For Ancient Hebrew, as is well known, boasts no written symbols for vowel sounds. Though the ancient tongue was the one Helmont sought to equate with divine language, he had included in his study the vowel symbols developed in the early medieval period, brushing over the temporal discrepancy with a brief explanation that "whoever devised these [vowel] figures, whoever they were and at whatever time they lived, did not stray from the nature of the vowels." ["Id solummodò hîc intenditur: ostendere, quod illi, qui has figuras excogitarunt, quicùnque demùm illi fuerint, & quoconque id factum sit tempore; non usque adeò à Natura vocalium aberrverint"] (Helmont, F.M., *The Alphabet of Nature: A Short*

Helmont's sectional drawings, but evidently intrigued by this question of "the true nature of the vowels," Reyher veered off on a brief tangent from the text he had set out to elucidate. "I have sometimes observed," he reflects, "that vowels differ not only in the shape of the mouth and tongue, but also by reason of tones" (*vocales non tantum figura oris & linguæ, sed etiam ratione toni differre*). Moving away from the speech organs of vowel production and toward the vowel sounds themselves, Reyher proceeds to consider these vowel 'tones' with greater precision. "If the voice is suppressed, and only the qualities of the breath pronounced," he observes, "one or more [tones] can be heard in the immediate vicinity."[70] Any whispered vowel, Reyher would seem to suggest, bears within it a distinctive 'tone,' or indeed multiple tones, distinct from those hovering within the other vowel sounds. The tones, curiously, appear to derive not from the voice (*voce*)—whose shared etymology with the term 'vowel' (*vocalis*) indicates the closeness of their relation—but from another source entirely. For it is when the vocal chords are suppressed, rather than struck, that the vowel tones emerge most clearly, ushered in by the exhaled "qualities of the breath" (*quali halitu*).

In order to record these tones, Reyher relates them to the "keys" (*claves*) of a musical instrument, most likely a harpsichord, summarizing his observations on a musical staff:

Sketch of the Truly Natural Hebrew Alphabet, trans. Allison Coudert and Taylor Corse, Boston: Brill, 2007, pp. 136-7).

[70] "Occasione hujus observavi, vocales non tantum figura oris & linguæ, sed etiam ratione toni differre, si suppreßa voce & quali halitu solo pronuncientur, ita tamen, ut ab uno vel pluribus maximè vicinis exaudiri queant" (Reyher 1679: 432).



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As the lines above them indicate, the tones, though marked with the letters A-G familiar to the modern musician, are not transposable by octaves as such letters are. The vowel E, for example, corresponds to $\bar{\mathbf{a}}$, though not to **a**, which corresponds to the deepest of the A vowels; O corresponds to **g,** but not to $\bar{\mathbf{g}}$, which corresponds to Æ. Thus the notation would seem to suggest what we might call, , in modern terms, "pitches." Though noted in a diatonic scale, Reyher's tones do not describe a tonal key, and indeed require the interval of the semitone: the second deepest A corresponds to $\bar{\mathbf{b}}$ while Ü corresponds to $\bar{\mathbf{b}}\flat$; Æ and Ö would appear to correspond to the **g** and **g**♯, the uncommented, intervening "x" likely noting the dissonance of the passage from one to the next.

Reyher's remarkable observations, as well as the notation employed to record them, merit a moment's pause. It bears noting, for instance, that his brief account marks a curious development in the consideration of linguistic sounds. Rather than render his observations about speech sounds in drawings of the human speech organs, as Helmont had done, or in verbal descriptions of those organs' movements, as was exceedingly common at the time, Reyher

[71] "§. 41. […] Si igitur ex. gr. A brevissimum seu clarissimum respondeat clavi $\bar{e}$, respondebit A longum, quod tamen melius medium appellatetur, clavi $\bar{c}$, quia logissimum [sic] sive obscurissimum effertur per clavem a. Huic succedit O respondens clavi g. Denique V quae auditur per clavem e" (Reyher 1679: 432-3).

turned instead to the musical scale.[72] The novelty of this decision may be more fully appreciated when considered in light of the history of musical and linguistic study. For in the Medieval division of knowledge, the study of language and the study of music were decidedly distinct. The former fell to the side of the trivium, home to the arts of grammar, dialectics, and rhetoric; the latter, to the side of the quadrivium, beside the arts of astronomy, mathematics, and geometry. The seamless ease with which Reyher moves, via the term "tone," from linguistic sound to musical note belies a leap of considerable proportions. To be sure, the musical notation Reyher employs is said to derive from tiny marks noted above words to be recited, indicating the movements of their intonation.[73] But the tones the German mathematician renders in their script are not those of the singing, or even speaking, voice. Rather, they are tones that emerge in the event of that voice's suppression, inhering all but imperceptibly within the sounds of language itself.

Though Reyher proceeds no further into his inquiry, the curious phenomenon he notes resurfaces in a number of studies in the following century. In a phonetics dissertation submitted in Heilbronn in 1781, Christoph Friedrich Hellwag cites discussions of musical tones within the

[72] Reyher's scale, appearing as it does in the midst of a commentary purportedly bearing on an Ancient Hebrew text, might also draw its inspiration from the diacritical dots that accompany consonants in Ancient Hebrew, indicating the presence of the vowels. These diacritical markings bear some resemblance to the neumes marking melodic ascent and descent in early music, and may, therefore, have suggested an association of vowels with tones through their graphic congruence.

[73] See, for example, Kenneth Levy, "On the Origin of Neumes," *Early Music History* 7 (1987): 59-90; Leo Treitler, "The 'Unwritten' and 'Written Transmission' of Medieval Chant and the Start-Up of Musical Notation," *The Journal of Musicology* 10.2 (Spring 1992): 131-91; and Marie-Elisabeth Duchez, "Des neumes à la portée: Elaboration et organisation rationnelles de la discontinuité musicale et de sa représentation graphique, de la formule mélodique à l'échelle monocordale," *Canadian University Music Review* 4 (1983): 22-65.

vowel sounds by not only Reyher, but also De Brosses, Nast, Heinicke, and Fulda.[74] Hellwag himself attests to his conviction that "there echoes in each of the different vowels a tone relative to the musical scale," though the inner harmony that this observation seems, to him, to impute to human speech, and perhaps to the human speech organs, presents too overwhelming a question to pursue.[75] Further investigation of the subtle tones would resume some twenty years later, when the physician and Lutheran minister Heinrich Gustav Flörke, in seeking to refine the German writing system for foreign readers, would note the problematic absence of any notation for the "scale of the vowels" (*Tonleiter der Vokale*).[76] How, indeed, were foreign readers to intuit the proper intonation of the German vowels, which manifested themselves in such various ways depending upon the consonants surrounding them? "When I say 'att,' for example," Flörke writes, "and in so doing allow the 'a' to make something clearly audible, the tone of the breath (*Ton des Hauches*) goes from the vowel 'a,' which we take as the fundamental tone (*Grundton*), to the major third above it— and when I pronounce the 't' at the end more forcefully, to the

[74] Christoph Friedrich Hellwag, *Dissertatio de formatione loquelae*, Heilbronn: Verlag von Gebr. Henninger, [1781] 1886, pp. 45-53.

[75] "§ 63: Hae vocalium qualitates tam in sonora quam in suppressa voce observantur: sed aliam qualitatem memoratu dignissimam vocales suppressa voce pronunciatae ostendunt, quae non ita patet in sonora voce. Susurrus iste, quo quaelibet vocalis suppressa voce pronunciata resonat, in singulis differt vocalibus quoad tonum ad scalam musicam relatum: si vocales secundum scalam naturalem supra designatam successive pronuncientur, etiam ordo susurrorum cum ordine tonorum in scala musica mire concordabit, ita ut *u* respondeat tono gravissimo, *a* medio, *i* acutissimo: *u, o, å, a, ä, e, i*. Vocalibus hac ratione in voce suppressa adhibitis exprimere adeo melodiam cantionis quodammodo possumus, quod cum unica vocali fieri nequit, ut in sonora voce omnino potest. Non quidem dubito de constanti harmonia quoad ordinem naturalem inter vocales et tonos, quibus illae respondent; an vero tonorum istorum intervalla in quovis homine ad constantem normam restricta sint, vix ausim statuere" (Hellwag, *Dissertatio*, pp. 45-6).

[76] Heinrich Gustav Flörke, "Tonleiter der Vokale," *Neue Berlinische Monatschrift* 10 (September 1803): 161-84; see also Flörke's "Nachtrag zu dem Aufsatze: Die Tonleiter der Vokale," *Neue Berlinische Monatschrift* 10 (February 1803): 343-71.

fourth."[77] As his terminology and title suggest, Flörke conceives of the vowel tones in terms of a musical scale, but unlike Reyher, he records those tones in the relative terms of musical intervals. The French "e fermé," for instance, is "one whole tone" (*einen ganzen Ton*) higher than the low 'e' or 'ä',"[78] but none of Flörke's vowels is fixed to a particular pitch. Noting that men, women, and children speak in markedly different registers, Flörke observes that the vowel scale must be a transposable set of intervals, musical in their internal relations, but not fixed, as it were, in any one key. These intervals, however, prove far more difficult to discern than Flörke had initially hoped. Slipping up and down not only in relation to each other, but also in relation to themselves in different contexts, the vowel tones defy Flörke's attempt at a comprehensive writing system for their sounds. Overwhelmingly numerous, inconstant, and above all, so subtle as to escape even the attentive ear, the tones disappear from Flörke's writings shortly after they appear. "In the noisy city of Berlin," the minister concludes, "one seldom finds a moment so peaceful as to permit him, undisturbed, to attend to the tone of a breath, which is always very weak,—unless he wants to use a sleepless, midnight hour to do so."[79]

Over in the quiet quadrangles of Cambridge, the young Englishman Robert Willis came upon the problem from an entirely different angle. Unlike his German predecessors, of whom he appears to have had no knowledge, Willis came to the question of vowel tones not by observing the sounds of his own speech, but by trying to imitate them through artificial means. In a paper "On the Vowel Sounds and on Reed Organ-Pipes," presented at the Cambridge Philosophical

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[77] "Wenn ich z.B. att ausspreche, und dabei das a etwas deutlich hören lasse, so geht der Ton des Hauches von dem Vokal a, als Grundton betrachtet, in die große Terz über, —und spreche ich das t am Ende härter aus, in die Quarte," (Flörke, "Nachtrag," p. 371).
[78] Flörke, "Nachtrag," p. 349.
[79] "In dem geräuschvollen Berlin findet man indeß nur selten einen so ruhigen Augenblick, wo man ganz ungestört auf den Ton eines Hauches, der immer nur sehr schwach ist, achten könnte, — wenn man nicht etwa einst eine schlaflose Stunde der Mitternacht dazu anwenden will" (Flörke, "Tonleiter," p. 185).

Society in the winter of 1828-9, Willis argued that the vowels of the human voice fell in a set, linear series whose order could be demonstrated. Following the lead of two eighteenth-century inventors credited with the creation of speaking machines, Christian Kratzenstein and Wolfgang von Kempelen, Willis had affixed a reed to a sliding pipe of variable length, finding that when the reed plays one consistent note and the pipe is simultaneously made to extend in length, "the series of effects produced are characterized and distinguished from each other by that quality we call the vowel."[80] The vowels produced pass through a set series, IEAOU, which, upon completion, reverses its order and repeats itself indefinitely, "the vowels becoming less distinct in each successive cycle."[81]

Recording the vowels' series and the lengths of pipe at which they occur, Willis finds not only that "the pitch of the sound produced is always that of the reed or primary pulse," but also that the lengths of pipe at which the vowels sound bear a calculable relationship to the wavelength of the sounding pitch.[82] Any vowel can be produced at any pitch, in other words,

[80] Willis 1830: 247. Kratzenstein's talking machine, capable of producing all the human vowels, came to light upon winning the annual prize contest held by the Imperial Academy of St. Petersburg in 1779. The challenge questions, very likely traceable to those proposed by Leonhard Euler in his studies of sound there thirty years prior, were: "First, What is the nature and character of the sounds of the vowels A E I O U, so different from each other?" and "Secondly, Can an instrument be constructed like the *vox humane* pipes of the organ, which shall accurately express the sounds of the vowels?" (C.G. Kratzenstein, *Testamen Coronatum de Voce*, St. Petersburg: Imperial Academy, 1780; see also Charles Wheatstone, "Reed Organ-Pipes, Speaking Machines, etc.," *The London And Westminster Review*, October 1837: 16). Wolfgang von Kempelen's lively defense of his talking machine gives reason to believe that the absence of such ingenious inventions prior to the late 18th century was due, at least in part, to religious concern. The Viennese scientist goes to great lengths to reconcile the possibility of artificial speech with John I.1-5 of the Christian Bible (Kempelen, *Mechanismus der menschlichen Sprache*, Wien: J.B. Degen, 1791, pp. 50-6).
[81] Willis 1830: 240.
[82] Ibid.

provided that the size of the resonating cavity be adjusted into a particular proportional relationship to the wavelength of that pitch.[83]

Though Willis observes quite clearly that it is the pitch of the sounding body, and not that of the resonator, that determines the dominant pitch produced, he remains curiously reluctant to dissociate pitch from 'vowel quality,' as he calls it. Upon recognizing the irrelevance of the reed's pitch to the whole instrument's ability to produce any vowel, Willis immediately argues with himself, "But this vowel quality may be detected to a certain degree in simple musical sounds: the high squeaking notes of the organ or violin, speak plainly I, the deep bass notes U, and in running rapidly backwards and forwards through the intermediate notes, we seem to hear the series U, O, A, E, I, I, E, A, O, U, &c." So it would seem, Willis maintains, as if "each vowel was inseparable from a peculiar pitch."[84]

It was, as Willis notes, a variation upon the curious quandry Wolfgang von Kempelen had articulated nearly forty years before. Although the Viennese scientist recognized the same

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[83] Willis notes one exception to this; namely, "When the pitch of the reed is high, some of the vowels [U] become impossible" (240).

[84] Ibid., 247-8. It is interesting to note, in passing, that this excerpt, like many from Willis's essay, suggests a certain anxiety on the part of the author in discerning the distinction between human and non-human sounds. Kempelen's anxiety over the potentially blasphemous nature of speaking machines, in other words, seems that it might be present in Willis's text as well, albeit more subtly. One wonders whether the essay that lay the foundation for the modern study of vowels in physical terms might not have been motivated by a desire to articulate the distinction between human speech and the sounds articulable by organ pipes. The likeness between the human speech apparatus and reeds and flues of organs had been long noted, as the upper and lower "lips" of the flue, and "tongue" of the reed attest, but the implications of this correlation had come under newly intense scrutiny in the early nineteenth century. It was not only inventors like Kempelen and Kratzenstein who were confronted with the problem; just five years before Willis delivered his paper, the French surgeon Félix Savart had advanced an elaborate comparison of the human voice, organ sounds, and birdsong that caused considerable controversy much closer to Willis's Cambridge circles (Savart, "Nouvelles recherches sur les vibrations de l'air," *Annales de chimie* XXIX (August 1825): 404-26; "Mémoire sur la voix humaine," *Annales de chimie* XXX (September 1825): 64-87; "Mémoire sur la voix des oiseaux," *Annales de chimie* XXXII (May-June 1826): 5-24).

evident truth that a vowel may be produced at any pitch and so must be structurally independent of it, he, too, expressed a sense of dissatisfaction with this conclusion. "It seems to me," wrote Kempelen, "that when I pronounce the different vowels on the same pitch, they possess something that suggests a change to my ear, and gives me the impression of a certain melody—which, however, I know perfectly well can only be produced by the variation of higher and lower pitches."[85]

Seeking to relate the "peculiar pitch" of each vowel to the equation governing the pipe length necessary for its production on a given pitch, Willis turns to the recent work of Leonhard Euler and the Swiss mathematician's explanation of the "secondary pulses" that accompany any given note. Perhaps, he hypothesizes, the "peculiar pitch" of the vowel produced at any length of pipe corresponds to the "secondary pulsations" of the primary pitch sounding from the reed. For the hypothesis to hold, Willis reasons, "we ought to be able to shew that the note peculiar to each vowel in simple sounds, is identical with that of the secondary pulse in the compound sound."[86] Supposing "for simplicity…that after the third [pulsation] they become insensible," Willis assumes only one secondary pulse, whose wavelength he designates as "*s.*" Upon investigation, he finds that, indeed, the proportion of pipe length to sounding pitch that governs the production of vowels does seem to correspond to the "secondary pulse" of the sounding note.[87] "Hence it

[85] "§110. Noch muß ich ben den Selbstlauten eine kleine Bemerkung hinzusetzen, die etwan Stoff zu fernerem Nachdenken geben könnte. Mir scheint, wenn ich ausspreche, so haben sie doch so etwas an sich, das mein Ohr täuscht, und mich glauben laßt, als läge eine Melodie darin, die doch, wie ich gar wohl weiß, durch nichts anderes als die Beränderung der Töne in höhere oder tiefere hervorgebracht werden kann" (Kempelen, *Mechanismus der menschlichen Sprache*, Wien: J.B. Degen, 1791, p. 196; see also Table X, figure 3 in the appendix). It should be noted that "Selbstlaute" in Kempelen's usage refers not only to vowels, but to all elements of speech whose production does not require the presence of another sound. I.e., /m/ and /n/ are *Selbstlaute*, /b/ and /k/ are not.
[86] Willis 1830: 248.
[87] Ibid., pp. 244 and 247.

would appear," Willis ventures to surmise, "that the ear in losing the consciousness of the pitch of *s*, is yet able to identify it by this *vowel* quality."[88] The vowel sound, in other words, would appear to replace the proper tone of the resonating chamber—itself corresponding to the "secondary pulse" of the note played by the reed.

Bringing the proper tone of the resonant chamber into a mathematical relation with the primary pitch of the reed, Willis proposed the structure of a vowel with unprecedented precision. Evidently far from certain of his own findings, however, the Englishman had no sooner stated his results than he retreated in doubt. "As far as I have tried," he writes, "it appears to be the case, but there is so much room for the exercise of fancy in this point, from the difficulty of fixing on the exact vowel belonging to a simple sound, that I do not mean to insist upon it."[89]

Insist upon it Hermann von Helmholtz did, finding that, precisely as Willis's paper had suggested, each vowel—or we might equally say, resonant cavity of the mouth necessary to the pronunciation of each vowel—possessed a proper tone. Using resonators tuned to tones higher than those of his sounding reeds, Helmholtz was able to examine these tones with considerable precision. While Willis had considered but five vowels, constantly noting the lack of clarity in their production,[90] Helmholtz identified proper tones for eight. The finding, one might venture to observe, is likely attributable, at least in part, to the "Helmholtz resonator." Itself affixed to the

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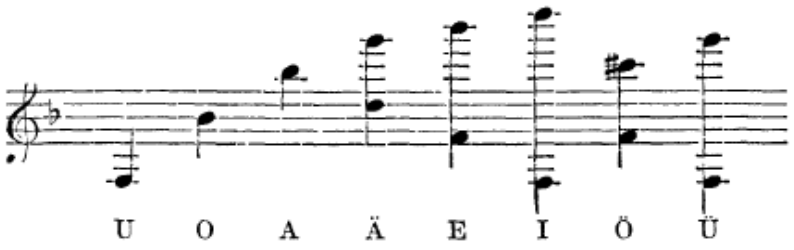
[88] Ibid., p. 247.
[89] Ibid., p. 248.
[90] "[…]vowels, it must be considered, are not definite sounds, like the different harmonics of a note, but on the contrary glide into each other by almost imperceptible gradations, so that it becomes extremely difficult to find the exact length of pipe belonging to each, confused as we are by the difference of quality between the artificial and natural vowels" (Willis 1830: 243); see also, "the difference between the vowels, depends entirely upon contrast, […] they are therefore best distinguished by quick transitions from one to the other, and by not dwelling for any length of time upon any one of them. A simple trial will convince any person, that even in the human voice, if any given vowel be prolonged by singing, it soon becomes impossible to distinguish what vowel it is" (Ibid., 234).

ear, and so subject to any vibrations of the head as the resonant cavity of the mouth is, a Helmholtz resonator might well produce clearer impressions of the vowel sounds than the free-standing pipes employed by Willis, Kratzenstein, and Kempelen. With his spherical resonators, Helmholtz was able to deduce the pitches of the resonant chambers that would produce the vowels U, O, and A, concluding that "the resonance of [a] single [over] tone is sufficient to characterize the vowels above mentioned." Other vowels, however, proved more difficult. Considering the shape of the mouth required for their production, Helmholtz discarded his globe-shaped resonators in favor of bottle-shaped ones. "When a bottle with a long narrow neck is used as a resonance chamber," he explains, "two simple tones are readily discovered, of which one may be regarded as the proper tone of the belly and the other as that of the neck of the bottle."[91] Pairing bottles with reeds, Helmholtz found that when the reed played a tone whose overtones coincided with the tones proper to the neck and belly of the bottle, most of the vowels no single resonator would yield might be produced.[92] Thus he arrives, after much experimentation, at the following arrangement:

[91] "Wenn man eine mit einem engen Halse versehene Flasche als Resonanzraum anwendet, findet man leicht zwei Töne, von denen der eine angesehen werden kann als Eigenton des Banches, der andere als ein solcher des Halses der Flasche" (Helmholtz 1863: 169; Ellis 1954: 107). Helmholtz may well have gleaned this idea from Flörke, who observes that some vowels seem to possess two tones, corresponding to the smaller and larger cavities within the mouth (Flörke, "Tonleiter," p. 179).

[92] The higher proper tones of Ä, E, and I, a subject of much contention, unfortunately elude even Helmholtz's bottle-shaped resonators, and had escaped his notice—though not his critics'—in his 1859 essay "Ueber die Klangfarbe der Vocale." At the cost of "much trouble," however, Helmholtz is able to observe them in women's voices singing high notes and men's falsettos and offers the pitches thus discerned (Helmholtz 1863: 174; Ellis 1954: 111).



[93]

These pitches, to be clear, are not pitches upon which the human voice produces the vowels in question. Rather, they indicate the tones the mouth poised to pronounce those vowels would reinforce, were such tones played into them. This phenomenon may be experienced to some degree, Helmholtz suggests, by singing a vowel into a piano whose dampers are raised and observing which strings, beside the prime sung, are set in sympathetic vibration. Or, he adds, echoing Reyher, Flörke, and his colleague F.C. Donders, by whispering vowels and listening for the pitch of the whistle thus produced.[94]

A few points in Helmholtz's account bear further comment. First, it will no doubt be objected that the pitches listed will not always coincide with an overtone of the note voiced. To this objection Helmholtz offers a simple explanation. While Willis had, for the sake of simplicity, supposed the presence of but one "secondary pulse,"[95] Helmholtz determines, by means of resonators applied to the human hear, that "the first six to eight overtones are clearly perceptible, but with very different degrees of volume according to the different forms of the cavity of the mouth."[96] Thus there are a number of overtones available in any voice, only one of

[93] Helmholtz 1863: 173; Ellis 1954: 110.
[94] Ellis 1954: 61 and 108; see also Helmholtz, "Harmony in Music," pp. 85-6.
[95] As Helmholtz explains, the "secondary pulse" identified by Willis is similar to, but not precisely the same as, Helmholtz's "first overtone" (Helmholtz 1913: 179-80; Ellis 1954: 117-8).
[96] "Bei der untersuchung des Klanges den menschlichen Stimme mittels der Resonatoren findet man deshalb wohl ziemlich regelmäßig die ersten sechs, bis acht Obertöne zwar deutlich warhnehmbar, aber je nach den verschiedenen Stellungen der Mundhöhle in sehr verschiedener Stärke" (Helmholtz 1913: 171; Ellis 1954: 104).

which need coincide with the proper tone of the vowel it wishes to produce. To this is added the observation that the proper tones of the vowels are possessed of a certain tolerance. While the overtone that strikes most perfectly upon the proper tone of the vowel will, naturally, be most distinct, the mouth's resonant cavity will respond to a range of pitches within a certain distance from its proper tone.[97] Thus, Helmholtz concludes, "It is only when the proper tone of the cavity of the mouth falls midway between the prime tone of the note sung by the voice and its higher Octave [first overtone], or is more than a Fifth deeper than that prime tone, that the characteristic resonance will be weak."[98] Unsurprisingly, men and women do not choose to speak on such pitches. The range of pitches at which men and women can speak being limited, both are able to produce vowels at nearly any pitch they choose, as "all of these pitches of the speaking voice have the corresponding proper tones of the cavity of the mouth situated within sufficiently narrow intervals from the upper overtones of the speaking tone to create sensible resonance of one or more of these overtones, and thus characterise the vowel."[99] Finally, Helmholtz adds, the speaking voice "probably through great pressure of the vocal ligaments upon one another […] possesses stronger overtones than the singing voice."[100] This is why the vowels spoken possess a greater clarity than vowels sung. "Were it otherwise," Helmholtz points out, "'books of words' at concerts and operas would be unnecessary."[101]

In the Helmholtzian account, then, vowels are categorically distinguished from all other sounds not by their "particular pitches" or "proper tones," but by their common assertion of an interval. While most *Klänge* consist of a powerful prime accompanied by overtones decreasing

[97] Ellis 1954: 113.
[98] Ibid.
[99] Ibid.
[100] Ibid., pp. 113-4.
[101] Ibid., p. 114.

in volume as they ascend and die out, a vowel consists of a dampened prime accompanied by an overtone of rivaling, even overpowering, presence. This second tone (which need not be the second overtone) disrupts the normal, progressively diminishing balance of tones, resulting in a decidedly peculiar *Klangfarbe.* This *Klangfarbe,* unlike all the other *Klangfarbe* investigated in Helmholtz's work, manifests itself in a distinctive sound immediately recognizable to the human ear as a vowel. Rather than sounding the musical interval its structure would lead one to expect, the combination of the reed plus resonator produces something entirely different, which is identified not as a musical interval, but rather as a linguistic element. As Robert Willis had quizzically observed, it is as though "the ear, in losing the consciousness of the pitch of [the resonator], is yet able to identify it by this *vowel* quality."[102] Though Willis had gone to great effort, at the start of his study, to assert that "Vowels are a quite different affection of sound from both pitch and quality […and b]y quality, I mean that property of sound, by which we know the tone of a violin from that of a flute,"[103] in truth his experiments lead to the collapse of that very distinction. For in Helmholtz's account, the "affection of sound" constitutive of vowels is revealed to be but a particular type of *Klangfarbe*. "Vowel quality" is not other than *Klangfarbe*; it is precisely that.

Yet, as Willis's observation attests, the passage from musical tone to vowel quality is a curious one. Indeed, it would appear to entail a "loss of consciousness" of a pronounced musical pitch—a pitch that is, nonetheless, integral to its realization. The passage into the element of language would thus appear to require a passage out of the realm of music—phenomenal, physiological, or psychological in nature. To speak of the *Klänge der Vokale* ("musical sounds of vowels"), then, is to find one's self in a curious contradiction of terms: for it is only in the

[102] Ibid., p. 247.
[103] Willis 1830: 234.

forgetting of its musical aspect that a vowel emerges as an element of language, and it is only as an element of language that a vowel may be said to exist at all.

For the vowel sounds investigated by Willis and Helmholtz, for all their complex structure, comprise a category of sound assumed rather than demonstrated. 'Vowels' are simply heard, intuitively, as such. Both scientists note that the vowel sounds differ across languages, to be sure, but the general category of vowels remains a matter of intuition, its identification hinging entirely upon the human ear. Helmholtz offers no external means of defining this category of sound, which, though named unambiguously as a linguistic one (*Vokale*), emerges under the rubric of "musical sounds," or *Klänge*.[104]

Unlike the other types of musical sound beside which the vowels are treated [*Klänge der Saiten* (Musical Sounds of Strings), *Klänge der Streichinstrumente* (Bowed Instruments), *Klänge der*

[104]*Klangfarbe*, although ostensibly an aspect of sound proper only to *Klänge*, appears to extend somewhat beyond the realm of music elsewhere in Helmholtz's writings, as well. In his lecture on "The Physiological Causes of Harmony in Music," for instance, Helmholtz notes the *Klangfarbe* not only of musical instruments, but also of "the human voice, or of a dog's howl." Though an untrained individual would hardly be able to say what aspect of sound indicates its source, the professor explains, any person can tell you which sound is a flute, a human voice, or a barking dog. "Whether a violin or a flute, or a man or a dog, is close by us is a matter of interest for us to know," he continues, "and our ear takes care to distinguish the peculiarities of their tones with accuracy. The means by which we can distinguish them, however, is a matter of perfect indifference." The musical intervals constitutive of these various sounds, Helmholtz seems to suggest, are heard and processed by the ear in a manner unknown to the conscious hearer. "Whether the cry of the dog contains the higher octave or the twelfth of the fundamental tone has no practical interest for us, and never occupies our attention. The overtones are consequently thrown into that unanalysed mass of peculiarities of a tone which we call its *Klangfarbe*. (Eine andere Combination solcher Töne gehört zum Ton der Flöte, oder der menschlichen Stimme, oder dem Heulen eines Hundes. Ob eine Violine oder Flöte, ob ein Mensch oder Hund in der Nähe sei, interessirt uns zu wissen, und unser Ohr übt sich die Eigentümlichkeiten dieser Töne genau zu unterscheiden. Durch welche Mittel wir sie aber unterscheiden, ist uns gleichgültig. Ob die Stimme des Hundes die höhere Octave oder Duodecime des Grundtons enthält, ist ohne praktisches Interesse, und kein Object für unsere Aufmerksamkeit. So gehen und denn die Obertöne mit in den weiter nicht näher zu bezeichnenden Eigentümlichkeiten des Tones auf, die wir Klangfarbe nennen)" (Helmholtz, "Die Physiologischen ursachen der musikalischen Harmonie," p. 83; Trans. Alexander Ellis 1996: 82).

Flötenpfeifen (Flute pipes), and *Klänge der Zungenpfeifen* (Reed pipes), the category *Klänge der Vokale*—tellingly translated in an entirely different manner as "Vowel Qualities of Tone"—begs the question of its own definition. Were the section to fall in parallel with its neighbors, *'Vokale'* would have to be a type of sounding body—that instrument to which a particular *Klangfarbe* corresponds. The imprecision that such a parallel title—*Klänge der menschlichen Stimme*, say—would introduce, however, suffices to indicate why Helmholtz might have preferred the sacrifice of parallel structure. A specific category of sounds of the human voice, vowels are, decidedly, sounds of language, and one can indeed imagine an organizational structure by which *Klänge der menschlichen Stimme* might have been productively divided into *Sprachliche Klänge* and *Unsprachliche Klänge*. The distinction between 'linguistic sounds' and 'non-linguistic sounds,' however, was not one of which Helmholtz could avail himself.

The lack of any physical means of distinguishing linguistic from non-linguistic sound persists, indeed, to this day. One could turn to any number of thinkers confronting this fundamental difficulty, though none is perhaps more prominent than Noam Chomsky, who points out that "A basic problem [of linguistic study] is that even the simplest elements of discourse are not detectable by procedures of segmentation and classification. They do not have the required 'beads on a string' property for such procedures to operate, and often cannot be located in some identifiable part of the physical event that corresponds to the mind-internal expression in which these elements function." Speaking beings hear some sounds as language and dismiss others as not-language, but the tools of physical science possess no such intuitive capacity. As Chomsky continues on to explain, "even the simplest units—morphemes, elementary lexical items, for that matter even phonological segments—can be identified only by

their role in the generative procedures that form linguistic expressions."[105] Without the human being conscious of language as such, linguistic sounds recede into a great mass of undifferentiated noise; and neither the science of linguistics nor that of physical acoustics has yet obtained a means of categorically (rather than approximately) distinguishing them from everything else.

If the *Klänge der Vokale* introduce the decided difficulty of rigorously defining linguistic sound, so, too, do they raise the question of the reach of the term "musical." For if we take Helmholtz at his word, his chapter title *Klänge der Vokale* should be translated as "the musical sounds of vowels." In Helmholtz's construction, "musical sounds" does not designate one category of the many sounds belonging to vowels, of which other categories might be offered (such as , for example, "the linguistic sounds of vowels"), but rather suggests that vowels fall under the category of "Musical Sounds." Within the terms of the definitions outlined at the start of the *Tonempfindungen*, one would be obliged to concede that vowels are indeed musical sounds, or *Klänge*: *Klänge* having been defined as sounds resulting from periodic motion of the air.[106] Why this particular periodic motion is perceived by the human ear as language, however, remains entirely unclear, as does the degree to which it is perceived as "musical." Taking for granted the existence of a category of sound definable only in terms of language, yet subjecting that category to a system of measurement known only to music, Helmholtz brings forth aspects of vowels of which neither the study nor the notation of language had offered any account. One might say he found music in the elements of human speech. But one would be obliged to ask to what degree that music, in becoming speech, had ceased, at least for human beings, to sound.

[105] "Preface to the Third Edition," *Language and Mind*, Cambridge: CUP, 2006, p. x.
[106] Helmholtz 1913: 13-4; Ellis 1954: 7-8.

III. Klangfarbe

Why Helmholtz settled upon the term *Klangfarbe* to designate his object of study is not entirely clear. A compound word unattested in the historical dictionary of the day,[107] *Klangfarbe* might be rendered overly literally as "sound-color" or "the color of a [musical] sound." In any case, the technical sense in which Helmholtz uses it is perfectly clear, as he provides us with its definition: it is "that peculiarity which distinguishes the musical tone of a violin from that of a flute or that of a clarinet, or that of the human voice, when all of these instruments produce the same note at the same pitch."[108] Its meaning is thus commensurate with the French *timbre*, whose etymological origins, however, are entirely distinct. A *timbre,* before becoming a technical acoustical term, was merely a drum[109]; *Klangfarbe*, on the other hand, can boast no such literal referent.

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[107] Jacob and Wilhelm Grimm, *Deutsches Wörterbuch : K*, Leipzig: S. Hirzel, 1873.

[108] "Unter Klangfarbe verstehen wir diejenige Eigentümlichkeit, wodurch sich der Klang einer Violine von dem einer Flöte, oder einer Klarinette, oder einer menschlichen Stimme unterscheidet, wenn alle dieselbe Note in derselben Tonhöhe hervorbringen" (Helmholtz 1913: 20; Ellis 1954: 10). While Helmholtz does judge it necessary to specify this meaning very clearly in the *Tonempfindungen*, he provides no such clarification in his 1859 essay, "Ueber die Klangfarbe der Vocale," (*Poggendorffs Annalen* CVIII [1859]: 80), first presented to the Royal Bavarian Academy of Sciences), in which he uses the term fluently. So, it could be that the term was already circulating amongst German-language specialists of the topic, and that his definition in the *Tonempfindungen* is more an indication of audience than one of terminological obscurity. This seems somewhat unlikely however, as there does not appear to be any written attestation of the term before Helmholtz, and the term used by his closest interlocutor on the topic, his friend and colleague F.C. Donders, is not *Klangfarbe* but *das Timbre* ("Ueber die Natur der Vocale," *Archiv für die Holländischen Beiträge für Natur- und Heilkunde* 1 [1857]: 157). Donders published in German just as Helmholtz did, but Donders was Dutch while Helmholtz was Prussian; it is possible that the foreign origin of the term *timbre* may have made it less palatable in Helmholtz's milieu, and that nationalistic concerns played some role in determining the terminological switch.

[109] The French *timbre* bears antecedents in the Greek τύμπανον, Arabic *tabl*, and Latin *tympănum*, all words for "drum"; *timbre*'s first appearance in French is identified as c1170, in

Perhaps it was the quantitative nature of his findings that led Helmholtz to reject the equally possible *Tonqualität* in favor of the more obscure *Klangfarbe.* It is likely that, in light of the distinction he establishes between the compound *Klang* and singular *Ton*, he preferred the more inherently compound nature of sound *Klangfarbe* thus implied.[110] Whatever its motivation, Helmholtz's choice of term introduced a new element, which, if not necessarily intended to carry immense weight, was nonetheless deemed appropriate by the Prussian scientist.

What *Klangfarbe* introduces that neither *Timbre* nor *Tonqualität* particularly suggests is, of course, color—*Farbe*—a topic with which Hermann von Helmholtz was anything but unfamiliar. The term's presence recalls another of his great works, the *Physiological Treatise on Optics*, carried out over the same years as the *Tonempfindungen.*[111] The simultaneity of the two projects is evident throughout both texts, as well as in the supplementary essays and lectures preceding their publication. Taken together, Helmholtz's collected writings on light and sound between the years of 1852 and 1867 leave little room for doubt as to the scientist's awareness in their phenomenal similarity. Reminders of their physical kinship as waves are frequent, as are analogies between the perception of musical sound by the ear and that of color by the eye.[112] "Just as the ear apprehends vibrations of different periodic time as tones of different pitch,"

Chrétien de Troyes' *Erec et Enide* ("timbre," *Trésor de la langue française*, http://www.le-tresor-de-la-langue.fr, accessed 16 July 2017).

[110] A simple *Ton* can, however, possess *Klangfarbe*; see *Klänge ohne Obertöne* ("Musical Tones without Overtones"), Helmholtz 1913: 120; Ellis 1954: 69.

[111] Helmholtz, *Handbuch der Physiologischen Optik*, 3rd. ed., Leipzig: Leopold Voss, [1867]1911; English edition ed. James P. C. Southall, *Treatise on Physiological Optics*, Wisconsin: George Banta, 1924.

[112] For an extensive and learned overview of this analogy's origins in classical music theory, see Eckhard Roch, *Chroma-Color-Farbe: Ursprung und Funktion der Farbmetapher in der antiken Musiktheorie*, Mainz: Schott, 2001.

Helmholtz is fond of explaining, "so does the eye perceive luminous vibrations of different periodic times as different colours."[113]

Rather than pursue the phenomenal similarity further, however, Helmholtz consistently turns instead to questions of perception. Ever the disciple of the great physiologist Johannes Müller, who was his teacher, Helmholtz reminds us that it is the senses, and not external phenomena, that determine the nature of sensation. Summing up a position he maintained throughout his scientific career, he explains, "Just as, on the one hand, each sensory nerve, excited by however so many influences, gives exclusively those sensations within the quality range proper to it, so, on the other hand, do the same external influences — when they impinge upon different sensory nerves — produce the most varied kinds of sensations, these always being taken from the quality range of the nerve concerned."[114] The example Helmholtz selects to illustrate this fact is, consistently, not sound and light, but rather, light and heat. He writes,

> The same aether vibrations as are felt by the eye as light, are felt by the skin as heat. […] Here the difference in kind of the impression is moreover so great, that physicists felt at ease with the idea that agents as apparently different as light and radiant heat are alike in kind, and in part identical, only after the complete alikeness in kind of their physical

[113] "Wie das Ohr Schwingungen von verschiedener Dauer als Töne verschiedener Höhe auffaßt, erregen Ätherschwingungen von verschiedener Dauer im Auge die Empfindung verschiedener Farben" (Helmholtz: 1913: 244; Ellis 1954: 148. Other examples include, but are far from limited to, pp. 54, 128, 169, 170; see also "Harmony in Music," pp. 68-9 and 92; Southall 1924: 76-7).

[114] "Wie nun einerseits jeder Sinnesnerv, durch die mannigfachsten Einwirkungen erregt, immer nur Empfindungen aus dem ihm eigenthümlichen Qualitätenkreise giebt: so erzeugen andererseits dieselben äusseren Einwirkungen, wenn sie verschiedene Sinnesnerven treffen, die verschiedenartigsten Empfindungen, diese immer entnommen aus dem Qualitätkreise des betreffenden Nerven," (Helmholtz, "Thatsachen in der Wahrnehmung," address delivered in Berlin at Friedrich Wilhelm University, 1878; rpt. in *Vorträge und Reden* Vol. II, Brauschweig: Vieweg und Sohn, 1884, pp. 224. Trans. Malcolm F. Lowe, "Facts in Perception," *Epistemological Writings* ed. Robert S. Cohen and Yehuda Elkana, Boston: D. Reidel Publishing Co., 1977, p. 120).

> behaviour has been established, by laborious experimental investigations in every direction.[115]

Though such an orientation would leave the way entirely clear for Helmholtz himself to pursue the evident question underlying the *Optics* and *Tonempfindungen*—in what way and to what degree are sound and light are alike in kind?—this question remains surprisingly tacit in both works. Only once does Helmholtz directly correlate the two phenomena, in the second volume of the *Optics*, published four years after the *Tonempfindungen*, in 1867. Reviewing the long history of attempts, beginning with Newton, "to divide the intervals of colour in the spectrum on the same basis as that of the division of the musical scale," Helmholtz puts forth a table of their correspondences on the basis of wavelength.[116] The units placed in parallel are both, tellingly, "tones": the *Farbentöne* on the right bearing witness to a third aspect of the ancient term, tacit throughout the *Tonempfindungen.*[117] The tones corresponding to a pendular vibration of the air

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[115] "Dieselben Aetherschwingungen, welche das Auge als Licht fühlt, fühlt die Haut als Wärme. […] Hier ist wiederum die Verschiedenartigkeit des Eindruckes so gross, dass die Physiker sich bei der Vorstellung, Agentien, die so verschieden erscheinen wie Licht und strahlende Wärme, seien gleichartig und zum Theil identisch, erst beruhigten, nachdem durch mühsame Experimentaluntersuchungen nach allen Richtungen hin die vollständige Gleichartigkeit ihres physikalischen Verhaltens festgestellt war" (Helmholtz 1884: 224; Lowe 1977: 120).

[116] "Da der Unterschied der Farbenempfindung im Auge wie der der Tonhöhe im Ohre dem Untershiede in der Schwingungsdauer der erregenden Licht- oder Tonwellen entspricht, so hat man vielfältig versucht, die Farbenstufen des Sektrum nach demselben Prinzipe abzuteilen, wie es bei den ganzen und halben Tönen in der musikalischen Tonleiter geschieht. NEWTON versuchte es zuerst" (Helmholtz 1911: 63; Southall 1924: 76).

[117] The use of the term "tone" in reference to visual sensations appears at least as early as Pliny's *Naturalis Historia* (c. 77-9 CE), Book 35, Chapter 11. Here it refers specifically to brightness: "The gradation between lustre and light on the one hand and shade on the other, was called 'tonos'; while the blending of the various tints, and their passing into one another, was known as 'harmoge' (*quod inter haec et umbras esset, appellarunt tonon, commissuras vero colorem et transitus harmogen*)" (Gaius Plinius Secundus, *Natural History* [*Naturalis Historia,* 77-9 AD] trans. John Bostock and H.T. Riley, London: Taylor and Francis, 1855; available online at perseus.tufts.edu/hopper/text?doc=urn:cts:latinLit:phi0978.phi001.perseus-eng1:35.11). In German, 'Ton' appears in reference to visual sensation only in the first half of the 18th century, at which point begins to mimic the

are placed on the left; those corresponding to a particular wavelength within the Solar spectrum, on the right. The extent of the tones included is defined by the Solar spectrum, though the intervals specified within that spectrum are dictated by divisions derived from the musical scale. The pitches noted are fixed within specified octaves, indicated by the capitalization of the musical notation, although they are, interestingly, not listed by wavelength or pitch number. Rather, they are set in a chromatic scale, manifest both in the interval selected (that of a semitone), and in the alignment of the two octaves in columns placed side-by-side:[118]

F♯, end of Red.	f♯, Violet.
G, Red.	g, Ultra-violet.
G♯, Red.	g♯, Ultra-violet.
A, Red.	a, Ultra-violet.
A♯, Orange-red.	a♯, Ultra-violet.
B, Orange.	b, Ultra-violet.
c, Yellow.	
c♯, Green.	
d, Greenish blue.	
d♯, Cyan-blue.	
e, Indigo blue.	
f, Violet.	

Noting that the interval of a semi-tone does not seem to correspond in any meaningful way to the colors strongly distinguished as different by the eye, Helmholtz concludes that "the magnitudes of the colour intervals are not at all like the gradations of musical pitch in being dependent on vibration frequencies."[119] The 'colour intervals' to which Helmholtz refers, however, unlike the musical ones beside them, are intervals based in entirely in perception. Although Helmholtz

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metaphorical extensions of the French *ton* ("Ton," *Grimms Wörterbuch: T*, Leipzig : S. Hirzel, [1913]1935, p. 749).

[118] First column: "Fis. Ende des Rot, G. Rot, Gis. Rot, A. Rot, B. Rotorange, H. Orange c. Gelb cis. Grün, d. Grünblau, dis. Cyan-blau, e. Indigblau, f. Violett"; second column: "fis. Violett, g. Überviolett, gis. Überviolett, a. Überviolett, b. Überviolett, h. Ende des Sonnenspektrums" (Helmholtz 1911: 64; Southall 1924: 77).

[119] "die Farbenstufen ihrer Größe nach keineswegs in ähnlicher Weise von der Schwingungsdauer abhängen, wie die Abstufungen der Tonhöhe" (Helmholtz 1911: 64; Southall 1924: 77).

turns directly to experimental refractions with prisms, and then proceeds vigorously through the history of color theory in search of a physical means of measuring the magnitudes of color intervals, his chapter on "The Simple Colors" (*Die einfachen Farben*) ends, essentially, in defeat. Lacking any external means of distinguishing the colors perceived as different by the human eye, Helmholtz concludes, "it is clear that in this so-called colour harmony, no such absolutely definite relations are to be expected as are characteristic of the musical intervals."[120]

A principle of measurement for the vast range of the color spectrum was not the only thing that lay, frustratingly, beyond Helmholtz's reach. At the close of his lecture "On the Physiological Causes of Harmony in Music," delivered in the winter of 1857 at the University of Bonn, Professor Helmholtz gestured not toward the infinite possibilities of where further research might lead, but rather toward the limits of what his own study of musical sound could hope to achieve. In a passage worth quoting in full, he mused,

> … both harmony and dysharmony alternately urge and moderate the flow of tones, while the mind sees in their immaterial motion an image of its own perpetually streaming thoughts and moods. Just as in the rolling ocean, this movement, rhythmically repeated, and yet ever varying, rivets our attention and hurries us along. But whereas in the sea, blind physical forces alone are at work, and hence the final impression on the spectator's mind is nothing but solitude—in a musical work of art the movement follows the outflow of the artist's own emotions. Now gently gliding, now gracefully leaping, now violently stirred, penetrated, or laboriously contending with the natural expression of passion, the stream of sound, in primitive vivacity, bears over into the hearer's soul unimagined moods which the artist has overheard from his own, and finally raises him up to that repose of everlasting beauty, of which God has allowed but few of his elect favourites to be the heralds.
>
> But I have reached the confines of physical science, and must close.[121]

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[120] "übringens kann offenbar bei der sogenannten Farbenharmonie von einer so strengen Bestimmung wie bei den musikalischen Intervallen nicht die Rede sein kann" (Helmholtz 1911: 99; Southall 1924: 118).

[121] "So treiben und beruhigen beide abwechselnd den Fluss der Töne, in dessen unkörperlicher Bewegung das Gemüth ein Bild der Strömung seiner Vorstellungen und Stimmungen anschaut. Aehnlich wie vor der wogenden See fesselt es hier die rhythmisch sich wiederholende und doch

The lecturer perceived a limit he would not transgress. His talk sought to elucidate the "physiological causes of harmony in music," a subject evidently distinct, in his mind, from that of music itself. "The essential basis for Music is *Melody*," Helmholtz states, in no uncertain terms, in the Preface to the Third Edition of the *Tonempfindungen*.[122] And between the study of harmony and that of melody, there lay, for Helmholtz, an inviolable threshold. It was this threshold that his obituarist Carl Stumpf would identify at the heart of the *Tonempfindungen*. In this monumental work on "the fundamental principles of art," Stumpf recalls, the reader "is led step by step from the simplest truths of physical acoustics to their physiological conditions, until finally, deep in the center of the system, he is brought […] over the threshold into the aesthetics of music. Here the author deliberately stops."[123]

It was a curious move on the part of a mind that pressed vigorously at the limits of the knowledge of its day, boldly advancing into uncharted territories of physiology, physics, and psychology. But the obscure zone distinguishing the motions of the sea from the movements of a human work of art was one that Hermann von Helmholtz did not enter. That region he left to others: to an elect of which he could not count himself a member. But if the scientist's startlingly

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immer wechselnde Weise der Bewegung und trägt es mit sich fort. Aber während dort nur mechanische Naturkräfte blind walten, und in der Stimmung des Anschauenden deshalb schliesslich doch der Eindruck des Wüsten überwiegt, folgt in dem musikalischen Kunstwerk die Bewegung den Strömungen der erregten Seele des Künstlers. Bald sanft dahin fliessend, bald anmuthig hüpfend, bald heftig aufgeregt, von den Naturlauten der Leidenschaft durchzuckt oder gewaltig arbeitend, überträgt der Fluss der Töne in ursprünglicher Lebendigkeit ungeahnte Stimmungen, die der Künstler seiner Seele abgelauscht hat, in die Seele des Hörers, um ihn endlich in den Frieden ewiger Schönheit emporzutragen, zu dessen Verkündern unter den Menschen die Gottheit nur wenige ihrer erwählten Lieblinge geweiht hat. / Hier aber sind die Grenzen der Naturforschung und gebieten mir Halt" (Helmholtz, "Die Physiologischen Ursachen der Musikalischen Harmonie," pp. 90-1; trans. Ellis 1996: 93).

[122] Helmholtz, "Preface to the Third German Edition [of the *Tonempfindungen*]," trans. Ellis 1954: vii.

[123] Carl Stumpf, "Hermann von Helmholtz and the New Psychology," *The Psychological Review* 2:1 (1895): 10. Translated from the German manuscript by Professor John Grier Hibben of Princeton College.

eloquent account is apt to provoke regret at his restraint, so, too, does it argue for the justice of his deference. His glimpse beyond the threshold of his expertise suffices to indicate the 'heralds' whose work continues in the line of his gaze. One might easily turn a stanza by Wallace Stevens, which, in its well-known meditation on the singer by the sea, seems to pick up precisely where Helmholtz left off:

> If it was only the dark voice of the sea
> That rose, or even coloured by many waves;
> If it was only the outer voice of sky
> And cloud, of the sunken coral water-walled,
> However clear, it would have been deep air,
> The heaving speech of air, a summer sound
> Repeated in a summer without end
> And sound alone. But it was more than that,[124]

[124] Wallace Stevens, "The Idea of Order at Key West" (1934), *Collected Poems*, New York: Knopf, 1955, p. 129.

CHAPTER TWO

"Pas la Couleur, rien que la nuance !" : Verlaine's Vowels

"Oui, il y a des poètes qui riment trop richement," Paul Verlaine acknowledges in a position piece published in the March 1888 issue of *Le Décadent*, "et c'est à ceux-là que j'ai pensé en écrivant quelques vers (d'ailleurs bien rimés) contre la Rime."[125] The concession appears in the course of Verlaine's lively defense of rhyme, authored in response to Ernest Raynaud's attack upon it in the journal's January issue.[126] Raynaud had protested against the Parnassian poets' "théorie sur la rime, qu'ils ont voulue riche et importante," arguing that a truly well constructed line had no need of rhyme at all.[127] Verlaine maintained in no uncertain terms that rhyme was absolutely requisite to French verse. "Notre langue si peu accentuée ne saurait admettre le vers blanc," he declared. "Rimez faiblement, assonez si vous voulez, mais rimez ou assonez, pas de vers français sans cela.[128]

The "Parnassian theory" to which Raynaud alludes reveals the unnamed target of his attack, Théodore de Banville, a leading figure of the prestigious literary journal *Parnasse contemporain*. In his *Petit traité de poésie française*, an influential versification manual published in the final days of 1871, Banville had expounded a doctrine of rich rhyme that was

[125] Paul Verlaine, "Un mot sur la rime," *Le Décadent* 3.6 and 3.7 (March 1888); rpt. in Paul Verlaine, *Oeuvres en prose complètes* ed. Jacques Borel, Paris: Gallimard, 1972, pp. 696-701 (henceforth *OpC*).
[126] Ernest Raynaud, "Chronique littéraire," *Le Décadent* 3.2 (January 1888): 8-10.
[127] Raynaud, "Chronique littéraire," p. 8. Raynaud argues that rhyme is "une cause de désordre musicale," that the composition of a poetic line requires "une orchestration savante," and that "plus cette orchestration se perfectionnera, plus la rime deviendra inutile" (9).
[128] Paul Verlaine, "Un mot sur la rime," *OpC*, p. 697.

judged extreme by nearly all of his contemporaries.[129] Although it is Banville, and not Verlaine, Raynaud attacks, the volatile Verlaine—a Parnassian himself—could scarcely have refrained from responding after Raynaud concluded his piece with the taunting observation that "une chose m'étonne, c'est de voir un artiste prestigieux comme M. Paul Verlaine s'attarder aux théories parnassiennes et ne pas vouloir lever l'étandard de la Révolte, lui si bien marqué par Dieu, pour cela."[130]

Taking up Raynaud's challenge, Verlaine attempts to cut a middle road, concurring that one can, indeed, rhyme too richly, but maintaining that the Parnassians' rhymes are above reproach. "Les grands Parnassiens, Coppée, Dierx, Hérédia, Mallarmé, Mendès, n'ont garde d'offrir de pareils scandales," he staunchly maintains. And as for Théodore de Banville himself, "que semblerait viser de façon plus spéciale le reproche de rimer trop richement, Verlaine writes: "relisez-le, et citez-moi une rime de lui qui ne soit rigoreusement judicieuse."[131]

One might well wonder, then, whom precisely Verlaine has in mind as he acknowledges the "poets who rhyme too richly," suggesting that it was these poets who motivated his famous "lines (well-rhymed, moreover) against Rhyme." As the lines to which Verlaine alludes belong to "Art poétique," the unnamed offenders would presumably have been writing sometime before April 1874, the date borne by the signed, manuscript copy of that text.[132] Whoever they are, they have vanished from the poetic circles of Paris by the time of the *Décadent* essay. "[J]e ne les vois

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[129] Théodore de Banville, *Petit traité de poésie française*, Paris: Éditions d'aujourd'hui, [1872]1978.
[130] Raynaud, "Chronique littéraire," p. 9.
[131] Verlaine, "Un mot sur la rime," *OpC*, p. 699.
[132] Verlaine composed the poem in prison in Mons in April 1874, published it in the November 10, 1882 issue of *Paris-Moderne*, and included it in *Jadis et naguère* in 1884. The poem features a full two stanzas on rhyme ("Art poétique," rpt. in Paul Verlaine, *Oeuvres poétiques complètes*, ed. Y.-G. Le Dantec and J. Borel, Paris: Gallimard, 1962, p. 327; henceforth *OPC*); in his *Décadent* article, Verlaine quotes one of the lines ("O qui dira les torts de la Rime ?") explicitly ("Un mot sur la rime," *OpC*, p. 698).

nulle part en *bon lieu*," Verlaine remarks in the 1888 text, "par conséquent dans les rangs du *Parnasse contemporain*."[133]

The unnamed rhymers Verlaine rebukes in "Art poétique," and again fourteen years later in "Un mot sur la rime" could, of course, simply be poets we no longer read: poets one does not come across, as Verlaine suggests, "en *bon lieu*." But such an assumption, lacking in positive evidence, seems dubious at the very least. In this chapter, I propose another hypothesis: that Verlaine's 1888 condemnation of rich rhyme emerges from a debate over the ideal balance of rhyme and meter that took place in the years between 1871-4 and may be traced through Théodore de Banville's *Petit traité de poésie française* (1871), Arthur Rimbaud's "Voyelles" (1871) and Verlaine's own "Art poétique" (1874). A close look at these texts suggests that the unnamed culprit of Verlaine's 1888 essay, as well as his 1874 poem, is none other than the author of the infamous "Voyelles."

[133] Verlaine, "Un mot sur la rime," *OpC*, pp. 698-9.

I. Rimbaud and Banville

The story begins in the autumn of 1871, when Arthur Rimbaud, newly arrived in the Parisian apartments of Théodore de Banville, is said to have composed the sonnet "Voyelles."[134] At the time of his unanticipated houseguest's arrival, Banville was in the midst of preparing his *Petit traité de poésie française* for publication, having suffered a number of setbacks due to the upheaval of the Commune earlier in the year. Although commentaries on the two texts have rarely considered them in relation to one another, the biographical circumstances of their composition would certainly seem to support the possibility of an intertextual relation.[135]

One might begin by noting that both texts are remarkable for their exceptional, even extreme, positions on rhyme. As Michel Murat has shown, the rhymes of "Voyelles" are the richest in Rimbaud's entire oeuvre: all seven of the rhymes are grammatically plural, six of the seven are feminine, and all but one (*voyelles/cruelles*) include the *consonne d'appui*. Altogether, this yields an average phonic equivalence of 2.85 (well above the 1 of minimum rhyme) and a staggering graphic equivalence of 5.27.[136] This formal trait of the poem has prompted differing

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[134] Arthur Rimbaud, *Oeuvres complètes facsimiles,* ed. Steve Murphy, Paris: Champion 2002, p. 543-4.

[135] See, however, Jacques Bienvenu, "Ce qu'on dit au poète à propos de Rimbaud et Banville," *La revue des ressources* (2009): <http://www.larevuedesressources.org/ce-qu-on-dit-au-poete-a-propos-de-rimbaud-et-banville,1355.html>.The lack of critical attention to possible intertextual relations between the two texts may be explained, in part, by the delayed publication of "Voyelles" only in 1883, as well as the difficulty of dating "Voyelles" (the sonnet survives in two manuscripts, neither of which is dated). Existing discussions of Banville in relation to Rimbaud and Verlaine tend to limit their discussion to Banville's rejection of the requisite masculine/feminine alternation of rhymes, a position adopted by both poets (see particularly Dominique Billy, "La rime androgyne: D'une métaphore métrique chez Verlaine," *Le vers français : Histoire, théorie, esthétique* ed. Michel Murat, Paris: Champion, 2000, pp. 297-347).

[136] Michel Murat, *L'art de Rimbaud*, Paris: Corti, 2002, p. 125. Murat defines phonic equivalence as the number of identical phonemes comprising each rhyme in the poem divided by

interpretations. For Murat, "*Voyelles* est le vrai manifeste Rimbaldien de la rime riche"[137]; others, finding rhymes' richness comically excessive, read it as Rimbaud's "faux manifeste de la rime riche."[138] What is clear, in any case, is that the rich rhymes of "Voyelles" form one of the sonnet's most striking characteristics.

When one considers the sonnet beside Théodore de Banville's *Petit traité*, it certainly seems difficult to deny the scent of satire lurking in Rimbaud's text. For Banville's treatise stands out among versification manuals of the nineteenth century for the unparalleled significance it accords rhyme, and, more particularly, rich rhyme.[139] In Banville's definition, French verse requires two elements, a regular number of syllables and a rhyme at the end of each line:

> Le vers français […] est seulement l'assemblage d'un certain nombre régulier de syllabes, coupé, dans certaines espèces de vers, par un repos qui se nomme *césure*, et toujours terminé par un son qui ne peut exister à la fin d'un vers sans se trouver reproduit à la fin d'un autre ou de plusieurs autres vers, et dont le retour se nomme LA RIME.[140]

Although Banville takes care to specify that lines must bear a "regular" (consistent) number of syllables and, in some cases, a caesura, it quickly becomes clear that these metrical requirements are entirely subordinate to the "sound that can exist at the end of a line only if reproduced at the end of another line, or at the end of many, and whose return is called RHYME." Indeed, for

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total number of rhymes; graphic equivalence is the number of identical graphemes comprising each rhyme in the poem divided by total number of rhymes.

[137] Murat, *L'art de Rimbaud*, p.117.

[138] Jacques Bienvenu, "*Art poétique* de Verlaine : une réponse au traité de Banville," *Europe revue littéraire mensuelle* 936 (2007), p. 100.

[139] C.f. the marginal role accorded rhyme in Louis Quicherat's *Petit traité de versification française,* 7th ed., Paris: Hachette, (1839) 1881; L. Becq de Fouquières' *Traité général de versification française,* Paris: Charpentier, 1879; and Charles Aubertin's *La Versification française et ses nouveaux théoriciens*, Paris: Belin, 1898.

[140] Banville, *Petit traité,* p. 9.

Banville, the metrical structure creating the line is but a pre-requisite to the art of versification, which he understands to be the art of rhyme and rhyme alone:

> la RIME […] est l'unique harmonie des vers et elle est tout le vers. Dans le vers, pour peindre, pour évoquer des sons, pour susciter et fixer une impression, pour dérouler à nos yeux des spectacles grandioses, pour donner à une figure des contours plus purs et plus inflexibles que ceux du marbre ou de l'airain, la RIME est seule et elle suffit. C'est pourquoi *l'imagination de la Rime* est, entre toutes, la qualité qui constitue le poëte.[141]

With meter serving as but a baseline, rhyme is the means by which a poet makes a line a work of art: rhyme can spark "grand and spectacular sights before our eyes" and "craft a figure with contours more pure and fixed than any in bronze or marble."

In Banville's extraordinarily limiting definition, "rhyme" refers to rich rhyme only: neither *rime pauvre* (homophony between line-final vowels, as in *plu*/*déçu*) nor *rime suffisante* (homophony between the last metrically significant vowel of a line and any consonants following, as in *chose*/*pose*, or, alternatively, preceding, as in *midi*/*attiédi*) provides a sufficiently strong cadence to complete a line. "Sans consonne d'appui, pas de Rime," Banville maintains; "et, par conséquent, pas de poésie."[142]

Although one might be inclined to consider rhyme a localized phenomenon affecting only the ends of lines and the order of their succession, Banville contends that rhyme also determines the interior architecture of each individual verse:

> *on n'entend dans un vers que le mot qui est à la rime,* et ce mot est le seul qui travaille à produire l'effet voulu par le poëte. Le rôle des autres mots contenus dans le vers se borne donc à ne pas contrarier l'effet de celui-là et à bien s'harmoniser avec lui, en formant des résonnances variées entre elles, mais de la même couleur générale.[143]

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[141] Banville, *Petit traité*, pp. 41-2.
[142] Banville, *Petit traité*, p. 50.
[143] Banville, *Petit traité*, pp. 42-3.

The line that might have seemed to be defined by metrical number is, in Banville, distinguished by the "color" of the rhyme-word, which sets the key, as it were, for the line of which it forms the cadence. The words in the line serve but "to harmonize with it, resonating variously amongst themselves, but with the same general color." The ideal line should be "variegated" but "harmonious," its sonorous design aimed at bringing out the nuances of the rhyme-word's "color," but certainly not introducing any elements of radical difference or dissonance.

Although Banville does not specify the source of the rhyme-word's "color," it would seem to be the last metrically significant vowel of the line: the vowel on which the accent falls, prosodically distinguishing the rhyme-word from all the others of the line. As Banville understands rhyme to be rich rhyme only, this "color" would seem to be determined not just by the timbre of the rhyming vowel, but by a combination of this vowel, the consonants following, and the preceding *consonne d'appui*. In Banville's rhetoric, the "color" of a line is set by the phonic composition of its rhyme; although the accent generated by meter is integral to this rhyme's constitution as such, it is the sound of the rhyme brought out by the accent—and not the meter itself—that defines the line.

Considering each line to be characterized by a single color conferred by the sound of its rhyme, Banville paints a sound structure that bears striking resemblances to the structure of Rimbaud's sonnet. Assigning one color to each vowel, Rimbaud confers a single color upon each line: with the exception of two opening verses and the enjambment "Golfes d'ombre," each vowel-color section is contained within discrete lines. The "general color of the line," in "Voyelles," is dictated not by the sonic structure of the line-final rhyme, as in Banville's account, but rather, by the string of associations drawn across the course of a line, which confer a color upon the vowel that sits at the start. This color calls attention to many aspects of that vowel: not

just its timbre, but also its graphic shape, its pitch, and the meanings of other words in which it appears.

Viewed from this angle, the structure of "Voyelles" seems to suggest a playful—and possibly snide—literalization of Banville's teachings. Acrobatically embracing the principle of richness to the point of absurdity (*latentes*/*éclatantes* seems to merit special mention), Rimbaud seems at once to demonstrate how easy it is to find a rich rhyme, and to mock Banville's notion that "la Rime est le moyen suprême d'expression et l'*imagination de la Rime* est le maître outil."[144] It is as if the agile poet, taking the rule to its extreme, means less to obey it dutifully than to expose its insufficiency. For while the rich rhymes of "Voyelles" seem almost to perform adherence to Banville's precepts, the colors evoked through the associations drawn out across each line certainly seem to overwhelm whatever "color" the rhyme might be said to confer, rich as that rhyme might be. Coloring each vowel with an evocative array of sensory associations, Rimbaud seems to demonstrate just how easily even a rich rhyme can be overpowered by other components of the poet's art—and also, perhaps, how unexciting the monochrome line that Banville exalts would actually be.[145]

[144] Banville, *Petit traité*, p. 234.
[145] The profusion of strange and contrasting colors within the space of a line is, outside of this poem, one of Rimbaud's hallmarks; see Michel Murat, *L'art de Rimbaud*, 2013, pp. 46-8.

II. " Pas la Couleur, rien que la nuance !" [146]

Although Paul Verlaine is known to have composed his duplicitous didactic poem "Art poétique" in the spring of 1874, readers of the poem have frequently observed that its formal concerns seem to relate much more closely to Verlaine's poems of the early 1870s than to the *Sagesse*, the collection he was working on contemporaneously.[147] In one of the poem's most recent commentaries, Jacques Bienvenu re-affirms this critical consensus, suggesting the poem's particular intertextual relationship with Théodore de Banville's *Petit traité*.[148] In addition to noting Verlaine's well-known preference for the *rimes androgynes* Banville advocates, Bienvenu points out that "Art poétique" borrows the rhymes in the stanzas on rhyme from none other than Banville:

> Prends l'éloquence et tords-lui son cou !
> Tu feras bien, en train d'énergie,
> De rendre un peu la Rime assagie.
> Si l'on n'y veille, elle ira jusqu'où ?
>
> Ô qui dira les torts de la Rime ?
> Quel enfant sourd ou quel nègre fou
> Nous a forgé ce bijou d'un sou
> Qui sonne creux et faux sous la lime ? [149]

The first rhyme of the first stanza, *cou*/*jusqu'où*, appears in Banville's "Le Budget" of *Odes funambulesques* (1869):

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[146] Paul Verlaine, "Art poétique," *OPC*, pp. 326-7.
[147] See Jacques Borel, *OPC*, p. 222; André Vial, *Faits et significations*, Paris: Nizet 1973, p. 161; and Claude Zissmann, "Rimbaud décadent," *Rimbaud 1891-1991*, ed. André Guyaux, Champion, 1994, p. 166.
[148] Jacques Bienvenu, "*Art poétique* de Verlaine : une réponse au traité de Banville," *Europe revue littéraire mensuelle* 936 (2007), pp. 97-108. Bienvenu makes a comprehensive and convincing case for an intertextual relationship between the two works; I but summarize his principal arguments.
[149] "Art poétique," *OPC*, p. 327.

Et toujours le Budget dévore. Ô ciel ! jusqu'où
Fourre-t-il cet or ! Quelle autruche !
Il sue, on voit saillir les veines de son cou :
Il enfle comme une baudruche ![150]

and the first rhyme of the second stanza, *Rime*/*lime*, appears in Banville's "Virelai à mes éditeurs," also in *Odes funambulesques*:

Ciseleur, brise ta lime,
Barbanchu nargue la rime ![151]

In Bienvenu's reading, Verlaine's stanzas on rhyme use Banville's verse against Banville's theory (just as Verlaine does explicitly in his 1888 "Un mot sur la rime"), using Banville's own *rimes suffisantes* in their own defense.

Rimbaud and Verlaine, then, would seem to be united in their rejection of Banville's theory of rhyme as articulated in the *Petit traité*, each in his own way using Banville against Banville to demonstrate that the rich rhyme at the end of the line is not the final word in French verse. A close look at their arguments, however, suggests that this may be the only point on which they are agreed. While both poets break with Banville, their texts stake out very different positions on the role of rhyme, as well as the ability of a rhyme to color a line. Mocking the aesthetic ideal of a monochrome line, Rimbaud would also appear to reject the very premise that a rhyme, however rich, can set the "general color" of a line. The extravagant notion of "inventing

[150] Théodore de Banville, "Le Budget," *Nouvelles Odes funambulesques*, Paris: Lemerre, 1869, p. 126; cit. Bienvenu 2007, p. 101. Bienvenu also points out that Banville takes up the rhyme again in his poem "La Marseillaise," which appeared in his 1871 collection *Les Idylles prussiennes*, a collection "que Verlaine connaît bien": "Elle vous mènera jusqu'où / Grince la défaite au front hâve ! / Ah ! vous pouvez lui mettre au cou / Votre ignoble collier d'esclave ;" (cit. Bienvenu 2007, p. 101).
[151] cit. Bienvenu 2007, p. 101.

the colors of vowels"[152] could occur only to one who assumes that vowels have no colors in the first place. Underlying Rimbaud's "Voyelles" is a basic disbelief in the phonic "colors" Banville attributes to accented vowel timbres that conclude each line (nuanced, of course, by the flanking consonants). Verlaine, on the other hand, while clearly distancing himself from both rich rhyme and Banville's aesthetic ideal of a harmonious, unified line dictated by rhyme, argues for an aethetic of "nuance" that partakes of precisely the same metaphor as Banville's phonic "colors."[153]

If we take a closer look at the second stanza on rhyme in "Art poétique," for example,

> Ô qui dira les torts de la Rime ?
> Quel enfant sourd ou quel nègre fou
> Nous a forgé ce bijou d'un sou
> Qui sonne creux et faux sous la lime ?[154]

we might observe that its play with rhyme is rather complex. While both Rimbaud and Banville observe a strict anti-rhyme structure, limiting homophonies to the line-final position and thereby re-inforcing the unit of the line, Verlaine inserts disorienting internal rhymes that confuse the clarity of division the line typically affords. The accented /u/ of "fou" in line two echoes the /u/ of "sourd" [suʁ], which falls at the previous caesura (a site at which rhyme is particularly forbidden, lest it be confused with the end of the line); the /u/ of "bijou" [bi.ʒu] just before the line-final "sou' [su] of line three complicates matters further.[155] While Banville argues that "*on n'entend dans un vers que le mot qui est à la rime*," Verlaine seems to structure his verse in such

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[152] Arthur Rimbaud, "Une saison en enfer," *Oeuvres complètes* ed. André Guyaux and Aurélia Cervoni, Paris: Gallimard, 2009, p. 263.
[153] The word "nuance," whose earliest use designates the change of hue caused by the passage of clouds over the sun, is defined as an "intensité, degré plus ou moins fort que peut prendre une même couleur" ("nuance," *Trésor de la langue française*, <http://www.le-tresor-de-la-langue.fr>. Accessed August 1, 2017).
[154] Verlaine, "Art poétique," *OPC*, p. 327.
[155] See Benoît de Cornulier, "La rime mal assagie et la musique populaire de l'*Art poétique* de Verlaine," *Revue Verlaine* 10 (2007), pp. 111-120.

a way as to render it difficult to distinguish which word is in fact the line-final rhyme. Verlaine's professed concern about rhyme as expressed in the preceding stanza ("Si l'on n'y veille, elle ira jusqu'où ?") might be better read as a taunting challenge to the reader.[156] The clarity of the unit of the line, associated with a single "color" in both Rimbaud and Banville, grows unstable here not because of any metrical aberration, but because of the play of rhyme within the lines.

The clarity of the line is further diminished, in comparison to the ideal espoused by Banville and realized in Rimbaud's sonnet, by the line-final rhymes themselves, which are not all rich. But if the rhymes themselves are not, strictly speaking, rich, it is worth noting that the pseudo-*consonnes d'appui* they draw into relation are strikingly similar. *Rime* and *lime* focus attention to the proximity, and subtle difference, between the liquids /r/ and /l/; *fou* and *sou* suggest the similarity and distinction between the fricative /f/ and the sibilant fricative /s/. If Banville's theoretical ideal is the "color" set by the full matching of the line-final vowel timbre and the consonants that surround it, Verlaine's ideal would appear to be matching timbres with the slightest shade of difference distinguishing the *consonnes d'appui*.

This shade of difference might offer one concrete, formal example of what Verlaine means when he advocates for an aesthetic of "nuance" in the fourth stanza of "Art poétique":

> Car nous voulons la Nuance encor,
> Pas la Couleur, rien que la nuance !
> Oh ! la nuance seule fiance
> Le rêve au rêve et la flûte au cor ! [157]

Just as the rhyming pairs *Rime*/*lime* and *fou*/*sou* call attention to the subtle distinction in the sounds of their *consonnes d'appui*, so do the line-final *nuance* and *fiance* draw our ears to the

[156] On this point, see Michel Grimaud, " 'Art poétique' de Verlaine, ou de la rhétorique du double jeu," *Romance notes* XX:I (Fall 1979), p. 199 as well as Cornulier 2007, p. 111-2.

[157] Verlaine, "Art poétique," *OPC*, p. 327.

shade of difference between the vowels of their initial syllables. Thus read, Verlaine's "Nuance" would seem to respond directly to Banville's aesthetic ideal of rich rhyme on Banville's own terms, concurring on the importance of rhyme in French verse, but arguing for a more subtle and flexible use of the tool. Rather than the "color" of the rich rhyme that re-asserts the unit of the line, Verlaine seems to say to both Banville and Rimbaud, why not the "nuance" of a weak rhyme or an internal rhyme?

This position would seem to be the one Verlaine asserts explicitly many years later in "Un mot sur la rime" when he insists that, contrary to Ernest Raynaud's argument for the elimination of rhyme,

> Notre langue si peu accentuée ne saurait admettre le vers blanc, et ni Voltaire, vice-roi de Prusse en son temps, ni Louis Bonaparte, roi de Hollande au sien, ne me sont des autorités suffisantes pour hésiter, fût-ce un instant, à ne me point départir de ce principe absolu. Rimez faiblement, assonez si vous voulez, mais rimez ou assonez, pas de vers français sans cela.[158]

Lacking lexical accent, the French language needs more than meter to sustain verse, Verlaine maintains; like Banville, he holds a basic metrical structure to be requisite, but ultimately insufficient in the absence of rhyme. Arguing against "le vers blanc"—an expression that would seem to understand rhymeless verse as "blank," "white," or, perhaps "colorless"—Verlaine falls short of advocating for the "color" of Banville's rich rhymes, describing a play of sounds that falls somewhere in between. His praise of Racine is particularly revelatory. Noting that the great playwright "n'a presque jamais la consonne d'appui," Verlaine observes that "chez lui le vers est si nombreux, si long et si mélodieux que ses finales mêmes sont comme une grâce sobre et chaste de plus. Et je ne serais pas éloigné de lui savoir un certain gré d'avoir en quelque sorte

[158] Verlaine, "Un mot sur la rime," *OpC*, p. 697.

innové de cette discrète et légère façon."[159] Diffusing the decisive power of the rich rhyme over the whole of the line, Racine, by Verlaine's account, would seem compose a superior "melody" than could ever be achieved in a compositional model that understands line-final rhyme to constitute "l'unique harmonie des vers."[160] Avoiding rich rhyme and dispersing the play of homophony throughout the line, Verlaine himself would seem to aspire to the sort verse composed by Racine: neither *blanc* nor determined by the color of line-final rhyme, but characterized by a certain "nuance" subtly at play throughout the line.

[159] Verlaine, "Un mot sur la rime," *OpC*, p. 697.
[160] Banville, *Petit traité*, pp. 41-2.

III. "*Tout vraiment est, doit être nuance.*"[161]

Ever since the publication of "Art Poétique" in 1882, the word "nuance" has been a critical commonplace around the name "Verlaine." Early readers of the poem even tended to grant it equal weight to the now better-known "music" championed in that poem's opening ("De la musique avant toute chose!") and towards the end ("De la musique encore et toujours !"). In Charles Morice's review of December 1, 1882, for example, we read, "La doctrine poétique de M. Verlaine se résume en ces deux mots : Musique et Nuance."[162] By the 1930s, the word *nuance* was so strongly associated with Verlaine that the newly founded "Société des Verlainiens" took the term, in the plural, as the title for their periodical: *Nuances*.[163] Today, little would appear to have changed. The term "nuance" recurs frequently in the critical literature, and the most comprehensive work devoted to the poet in recent years, Arnaut Bernadet's *Poétique de Verlaine* (2014), characterizes Verlaine as a "partisan résolu de la nuance." [164]

If everyone is agreed that Verlaine is "the poet of nuance," however, this consensus is attributable, at least in part, to the fact that no one has seriously inquired into what Verlaine

[161] Paul Verlaine, "Critique des *Poèmes saturniens*," *OPC*, p. 1072.
[162] Karl Mohr [Charles Morice], "Boileau Verlaine," *La nouvelle rive gauche I.4* [1 déc. 1882], p. 3.
[163] The journal, launched in 1934, was a literary revue intended to serve as an "Organe de défense du symbolisme Verlainien" (inaugural issue of Dec. 1, 1934). Though the first issue makes no reference to its title, the remaining 7 issues systematically feature a box in the upper left quadrant featuring the quote "Pas la couleur, rien que la Nuance" [sic]. After the war, the journal was relaunched under the title "Les Cahiers Paul Verlaine."
[164] Arnaut Bernadet, *Poétique de Verlaine*, Paris: Garnier, p. 744. Other indicative examples might include Steve Murphy's "Verlaine parnassien : Définitions, filiations, nuances," the postface to his critical edition of *Poèmes saturniens* (Paris : Champion, 2008), pp. 203-56 or Benoît de Cornulier's "Verlaine : les nuances de l'irrégularité," *Théorie du vers*, Paris : Seuil, 1982, pp. 275-279).

meant by "nuance." In contrast to the "music" famously championed in "Art Poétique,"[165] Verlaine's notion of "nuance" has fully escaped critical scrutiny. The word, though frequent in the critical literature, has had no precise or technical meaning, suggesting anything from "subtlety" or "refinement" to "sophistication," "distinction," "difference," and "specificity."

When the term has been used in a more technical sense, it has been applied to Verlaine's sensitivity to meter, and to the subtleties of rhythmic perception required of any who endeavor to scan his famously difficult *vers libérés*.[166] While I have argued here for a realization of Verlaine's aesthetic of "nuance" in his use of timbre and rhyme, rather than meter, the two readings are not incompatible. Indeed, Verlaine's notion of "nuance" may be glimpsed both in his use of rhyme and in his use of meter.

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[165] Verlaine's valorization of music was appropriated by Henri Bremond into a notion of *La poésie pure* (Paris: Grasset, 1926), in which "music" found itself allied with "abstraction" and "prayer," in opposition to a communicative language of "meaning." As Bernadet convincingly argues, the appropriation of Verlaine's notion of music into Bremond's notion of "pure poetry" can only be sustained by a willful misreading of Verlaine. See Bernadet, *Poétique de Verlaine*, pp. 63-6.

[166] See Benoît de Cornulier's "Verlaine : les nuances de l'irrégularité," pp. 275-279 and Jean-Pierre Bobillot's "De l'anti-nombre au quasi-mètre et au non-mètre : ''l'hendécasyllabe' chez Verlaine," *Revue Verlaine* 2 (1994), p. 84. Curiously, Bernadet remarks that in Bobillot's article "le vers attache cette fois à l'expression de la « nuance », autre devise de l'« Art poétique », une technicité qui lui est le plus souvent refusée » (Bernadet, *Op. cit.,* pp. 68-9). While the term *nuance* is not an illogical one to apply to the metrical technique Bobillot describes, it is Bernadet, and not Bobillot, who applies it. Bobillot does not furnish a definition of "Nuance" and indeed, only uses the word once, to note Verlaine's exceptionally perceptive metrical ear: "la « coupe » 4//7, pas plus que la 3//8 ou, éventuellement, que la 7//4 — inédites dans toute la poésie versifiée de la langue française — ne pouvant (même à l'oreille, si rompue à la « Nuance », de Verlaine) fonctionner, ni comme un automatisme reçu, ni même comme une référence partagée, mais, condition extrèmement restrictive, comme simple *indication d'une constante* […]" (Bobillot 1994, p. 84).

This is nowhere clearer than in the stanza on nuance itself:

> Car nous voulons la Nuance encor,
> Pas la Couleur, rien que la nuance !
> Oh ! la nuance seule fiance
> Le rêve au rêve et la flûte au cor ! [167]

Appearing no less than three times in the space of three lines, "nuance" disrupts the clarity of the line as established by the line-final rhymes just as the internal assonance of "sourd" and "bijou" did in the poem's seventh stanza ("Quel enfant sourd ou quel nègre fou / Nous a forgé ce bijou d'un sou"). But beyond that, the word nuance also instantiates the only metrical irregularity in the entirety of "Art poétique." A nine-stanza poem composed in quatrains of nine-syllable lines, "Art Poétique" bears a fixed caesura after syllable four in 35 of its 36 lines. The poem's sole metrical violation appears in the third line of the stanza above. Occupying syllabic positions four and five, the word "nuance" enjambs over the caesura, creating what might be called a *coupe enjambante* or a *césure italienne*. To the contemporary reader, the line appears perfectly metrical: it bears nine syllables just like every other line in the text. But as the metrician Benoît de Cornulier points out, at the time of the poem's composition, the enjambment over the caesura was

> rarissime, ou plutôt même pratiquement inexistant, dans les formes métriques périodiques telles que le 6-6, 4-6, le 5-5; le mètre périodique étant ici le 4-5, la césure italienne y donc est tout à fait surprenante, et elle ne pouvait que troubler un lecteur métrique de l'époque.[168]

The effect of the overrun caesura is heightened further still by the "contraste immédiat avec la césure particulièrement carrée, voire brutale, de la *Couleur*."[169] Viewed from this angle,

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[167] Verlaine, "Art poétique," *OPC*, p. 327.
[168] Cornulier, "La rime mal assagie et la musique populaire de l'*Art poétique* de Verlaine." *Revue Verlaine* 10, 2007, p. 115.
[169] Ibid., 116.

Verlaine's "nuance" would seem to coincide with a loss of one's metrical footing; "color," to a sure foothold in the rhythmic structure of the text.[170]

The two realizations of "nuance"—in a subtle play of rhyming elements dispersed across the line, and in a momentary loss of one's metrical footing—seem almost to dissolve into one and the same aesthetic experience, in which the two elements that had instantiated the clear unit of the line both conspire to obscure its boundaries. The disorientation of the overrun caesura leaves one grasping at the almost ostentatious dieresis of *nu-ance* and *fi-ance*: nearly rich rhyme-words confusingly placed in both line-final and mid-line positions.[171] Coming prominently, even promisingly to the fore in the moment of metrical foundering, the rhyming elements fail to restore the withdrawn structure, shimmering rather than solidifying into a perceptible line.

But the momentary loss of meter, rhyme, and even the very unit of the line lasts, in Verlaine, for but an instant. The caesura returns, as does the reassuring rhyme. "Nuance," obscuring the clarity of the cadence, never quite dissolves into blank verse for all that; no more than it effaces meter altogether. Verlaine, loosening the strictures of the line, seems to have meant only to awaken us to its presence, and, perhaps, its fragility.

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[170] The metrical irregularity would be disruptive in any case, but the specificity of the unbroken 9-syllable line it creates is worth noting, as it falls just beyond the threshold of metrical perception identified by Cornulier (Cornulier suggests that "en français, la perception instinctive et sûre du nombre syllabique est limitée, selon les gens, à 8 syllabes, ou à moins," *Théorie du vers*, p. 90). Cornulier's direct observation concerns the French language only and he limits his law to the perception of meter in French, but in his reflections on the potential generalizability of this law, he speculates that the human metrical capacity may be limited, in all languages, to eight of the relevant phonological unit (be it the syllable, beat, foot, mora, etc.). To prove this theory, one would, of course, be obliged to demonstrate that every poetic meter can be figured in numbers inferior to nine: a vast project in comparative poetics that lies well beyond Cornulier's competency, but whose suggestion does not immediately bring to mind glaring exceptions (Ibid., pp. 32-5). Though Cornulier does not extend his reflections beyond language, it would be interesting to press the question of generalizability further still, and to consider whether the limit of eight might not hold for the perception of rhythm in other art forms, as well, particularly music and dance.

[171] Ibid., 114.

CHAPTER THREE

"*Chimère, y avoir pensé atteste*" : Mallarmé and the Tension of Timbre

In the winter of 1894, Stéphane Mallarmé traveled to England "bearing news." "The most surprising kind." Judging from the opening lines of the lecture that was the reason for his voyage, he was fairly bursting with it. "Oui, j'apporte des nouvelles," he declared to the crowd assembled at Oxford's Taylor Institution on the first of March: "On a touché au vers." A fissure had emerged in the ancient unity long known indifferently as verse or as poetry, and Mallarmé, tracing it, had deduced the magnitude of its implications with astonishing prescience. Standing before the fault line that would bring untold reconfigurations, he marked the moment. He pointed. "Sûr, nous en sommes là, présentement," he observed. "La séparation."[172]

The separation Mallarmé's lecture describes is binary in nature: it identifies, on the one side, "[t]rès strict, numérique, direct, à jeux conjoints, le mètre, antérieur," and on the other, "l'épanouissement de ce qui naguères obtint le titre de *poème en prose.*" The separation divides meter from all the prose poem has inspired. It does not place the two elements in a relation of succession; it merely separates them. For despite the qualifier "from before" (*antérieur*) beside "meter," and the "just recently" (*naguères*) that characterizes the recognition of the prose poem, that which exists on either side of the divide persists into the present. As the derivatives of the prose poem flourish, "le mètre, antérieur, subsiste ; auprès."[173]

From a twenty-first century perspective, the division Mallarmé describes seems readily recognizable as that which exists today between "poetry" and "verse." Poetry, a porous and essentially undefined category, is as contested in scope and validity as were the prose poem and

[172] Stéphane Mallarmé, "La Musique et les Lettres," *Oeuvres complètes* ed. Bertrand Marchal, Vol. II, Paris: Gallimard, 2003, p. 64). Henceforth *OC II*.
[173] *OC II*, p. 64.

its derivatives in Mallarmé's day; verse, on the other hand, is just language set to meter.[174] That meter may be syllabic, accentual, tonal, quantitative, or any combination thereof, but whichever it is, it is the defining feature of the form we call verse, as it has been since antiquity. And while we are generally unwilling to accept that the world we live in is a world without poetry, we are less disconcerted by the suggestion that we might live in a world without verse. The art of versification, if not obsolete, is hardly a dominant one in the world today. No one seems terribly upset by this.

It might seem perverse, therefore, or at least unintuitive, to propose an inquiry into "verse"—the form that, more than a century ago, ceased to be synonymous with the far more lively "poetry." Verse, from the contemporary vantage point, would appear to have been just one possible form for the poetic spirit: a shell that housed a life which nonetheless continues on. Why dwell on the abandoned shell if the life has relocated elsewhere? In order, I suppose, to imagine the life that was: the life that once pulsated in the shell; the life that, indeed, made it. If that life is the same one that persists in poetry today, surely the shell has much to tell about it. The pages

[174] I am aware of two challenges to this definition. In his 1974 essay "Réflexions sur le fonctionnement du vers français," Jean-Claude Milner argues that "une séquence poétique n'est pas seulement un *mètre*, composé de parties distinguées, mais aussi *un vers,* c'est à dire un certain espace à l'intérieur duquel des processus spécifiques peuvent être définies et dont les bornes extérieures possèdent des propriétés caractéristiques" (*Ordres et raisons de langue*, Paris: Seuil, 1978, p. 285; italics Milner's). Hence Milner's argument that the line, or rather the phonological break that the end of the line instantiates in language, be considered the defining feature of verse. That which defines verse from non-verse, for Milner, is thus not meter, but the possibility of enjambment (p. 300). The other challenge is brought up, but not resolved, by Giorgio Agamben in his reflection on Milner's hypothesis. "Poiché, se il verso si definisce appunto attraverso la possibilità dell'*enjambement*," he writes, "ne segue che l'ultimo verso di una poesia non è un verso. Significa questo che l'ultimo verso si trasgredisce in prosa?" ("For if poetry is defined precisely by the possibility of enjambment, it follows that the last verse of a poem is not a verse. Does this mean that the last verse trespasses into prose?"; "La fine del poema," *Categorie italiane: Studi di poetica e di letteratura*, Rome: Laterza, [1996] 2011, p. 141; trans. Daniel Heller-Roazen, "The End of the Poem," *The End of the Poem* Stanford: Stanford UP, 1999, p. 112).

that follow, thus, explore the form called “verse,” insofar as Stéphane Mallarmé understood it at the moment it broke with “poetry.” They advance two propositions: first, that for Mallarmé, verse is not defined exclusively by meter; second, that in Mallarmé’s account, verse can exist in the absence of meter if it engages another aspect of language, which he calls “timbre.”

I. The Separation

The separation Mallarmé announced in his Oxford lecture drew a binary division between the "very strict, numerical, direct, with the play of its two parts, meter, from before," and "the development of that which just recently obtained the name of *prose poem.*" The substantives established as mutually exclusive are thus "meter" (*le mètre*) and "the development" (*l'épanouissement*). An asymmetry is immediately apparent. These substantives are not alike in kind: "the development" refers to a subset of literary production; "meter," to a formal constraint.

In the case of Mallarmé's announcement, framed as a field report from a neighboring nation, the meter at hand is the meter of French; more precisely, it is the "very strict, numerical, direct, with the play of its two parts, meter, from before." 'Very strict,' because bound by inviolable rules of syllable placement, rhyme type, and word boundary; 'numerical,' because it demands a procedure of counting; 'direct,' which is another way of saying "linear"; 'with the play of its two parts,' bifurcated by a mandatory caesura, or perhaps coupled by rhyme; 'from before,' having dominated French verse in previous centuries. It is, presumably, the alexandrine. Mallarmé's punctuation and word order are significant: while "strict, numerical, direct, with the play of its two parts" precede "meter," the temporal modifier "from before" is placed after the substantive and separated from it by a comma. Thus, it is pointedly not "the previous meter" (*le mètre antérieur*), which would be both singular and specific. Mallarmé's construction suggests "meter" in a more general way, as more capacious category: "meter, from before" (*le mètre, antérieur*). The specification "with the play of its two parts" (*à jeux conjoints*) indicates that this meter is capable of internal division. The "parts" to which Mallarmé refers are most likely the alexandrine's two hemistiches, indicating a total measure of one line; but, they could also refer to

the lines themselves, as within French, according to Mallarmé, "les vers ne vont que par deux ou à plusieurs, en raison de leur accord final, soit la loi mystérieuse de la Rime."[175] In either case, the meter from before is tied to a total measure derived from that of the line. On one side, then, we have meter and the line.

And what is "the development of that which recently obtained the name of *prose poem*"? Mallarmé explains its contours at some length. "[L]e vers est tout, dès qu'on écrit," he reports, less with the air of the author than with that of the surprised onlooker. There is "versification s'il y a cadence."[176] Verse, evidently, has broken with meter: though meter falls to one side, "verse" turns up on the other. And not just "verse", but indeed "versification": a term that, by its conventional definition, should designate precisely the art of composing in accordance with the metrical dictates across the divide. All that remains in terms of constraint upon "verse" is "writing" (*dès qu'on écrit*) and "cadence." The two constraints, at first glance, would appear to be mutually exclusive. Cadence, whether understood in the phonological sense of "vocal stress upon accented syllables, dividing a sentence into rhythmic units" or in the musical one of "the progression of chords, according to certain harmonic rules, that concludes a musical phrase"[177] would seem to pertain to the production of the voice; "writing," to that of the pen. The two constraints, if they cannot be jointly applied, must therefore be understood in parallel: in spoken language, verse exists as soon as a voice suggests a cadence; in written language, verse exists as soon as someone writes. We have a tautology. The constraint "as soon as one writes," in context,

[175] "Solennité," *OC II*, p. 201.
[176] "La Musique et les Lettres," *OC II*, p. 64.
[177] "CADENCE. 1. Appui de la voix sur les syllabes accentuées, marquant la répartition rythmique des éléments d'une phrase ; […] 2. Succession d'accords selon certaines règles harmoniques, terminant une phrase musicale" ("cadence," *Trésor de la langue française*, http://www.le-tresor-de-la-langue.fr, accessed 16 July 2017).

can only be understood if "to write" is read in a narrowed sense.[178] In other words: 'Written language is verse as soon as someone writes literature.' But what is the difference, for Mallarmé, between verse and literature? Is this statement not also a tautology?

If the defining feature of this particular prose is, as yet, obscure, one thing is certain: it not to be confused with "writing" as a general category. "[T]oute prose d'écrivain fastueux" falls within this domain specifically because it is "soustraite à ce laisser-passer en usage"; such writing "vaut en tant qu'un vers rompu, jouant avec ses timbres et encore les rimes dissimulées."[179] Mallarmé dissolves the distinction between the broken line (*le vers rompu*) and the prose poem (*le poème en prose*); prose and verse are no longer opposed. In the absence of meter and the line, verse and prose are one in the same; between the two forms, there is no longer any distinction.

Thus, the exact date of the Taylorian lecture is important: March 1, 1894. It represents a decisive moment not just in the history of verse, but also in the history of the poet's thinking about it. For just fourteen months before, Mallarmé had published a book entitled, precisely, *Vers et prose*.[180] Neatly organized into two sections, plainly labeled *Vers* and *Prose*, the book features Mallarmé's versified poems in the first half, his prose writings in the second. And although the "Prose (pour Des Esseintes)" appears in Part I and "Poèmes de Poe" in Part II, the apparent contradiction is in fact none at all. Mallarmé's title "Prose (pour Des Esseintes)" belies a strictly versified poem; "prose" in this context refers to the Latin hymns sung in Catholic

[178] See Jean-Claude Milner, "Mallarmé Perchance," *Hyperion: On the Future of Aesthetics* IX.3 (2015), p. 94.
[179] "La Musique et les Lettres," *OC II*, p. 64.
[180] *Vers et prose*, Paris: Perrin et Cie, 1893.

services.[181] And the poems of Edgar Allan Poe, though versified in English, appear exclusively in Mallarmé's prose translations. At the time of *Vers et prose*, the formal division remains intact.

By March of the following year, however, this is no longer the case. In place of the formal opposition, which relates two elements like in kind, an asymmetrical division has emerged. Within the vast realm of prose, there exists a sub-category that partakes of poetry and even of verse; it plays with cadence, timbre, and rhyme; it is distinguished from the versified poetry that preceded it by a singular absence: that of the metrical line. The separation does not divide verse from prose, nor verse from poetry; verse, stretched to breaking, falls on both sides of the divide.

This separation forms the basis of the title "Crise de vers," Mallarmé's watershed essay of 1897.[182] The word *crise*, in other words, bears the full freight of its Greek root (κρίσις), by which it designates "a separating"— a sense still palpable in certain English words of shared derivation ('discern,' 'discriminate').[183] The topic of the essay is thus the separating, or scission, of *le vers*, itself the bearer of two distinct meanings. *Le vers* is the versified line: once known in English as "a verse" and most precisely described in this context as "the metrical line" that is in the process of breaking apart. "Crise de vers," in this sense, might be translated as "the fracturing of the line." But *le vers* also bears the meaning of "verse," the genre comprised of literary works composed in metrical lines; hence the standard translation "Crisis of Verse." This "crisis"

[181] See Bertrand Marchal's commentary in *OC I*, p. 1177.
[182] The text, an amalgamation of several previous essays, was published in its definitive form in *Divagations* (Paris: Charpentier, 1897).
[183] "crise," *Trésor de la langue française,* http://www.le-tresor-de-la-langue.fr, accessed 14 July 2017; "κρίσις," Liddell and Scott, *An Intermediate Greek-English Lexicon*, Oxford: Clarendon Press, 1889 (consulted online at http://www.perseus.tufts.edu/ on 16 July 2017); "crisis," *Oxford English Dictionary Online*, http://www.oed.com, accessed 16 July 2017.

designates a decisive stage, "a sudden rupture" in the history of verse, to be sure.[184] But so, too, does it articulate, by means of its etymological root, a separating: of *le vers* (the line), and of *le vers* (verse).

[184] "crise" (*Trésor de la langue française*).

II. Of Verse With Verses, and Verse Without

If *le vers* (verse) need not be comprised of *vers* (lines), the question arises: what, if anything, makes it verse? "Verse is everything, as soon as one writes," Mallarmé declares—but only to follow that capacious definition with a number of statements that obscure its apparent extent. Verse is not limited to writing, as "versification" exists as soon as a voice expresses a cadence; everything written is not verse, only that which is "soustraite à ce laisser-passer en usage." But how does some prose "withdraw" from "habitual haphazard usage"? Some prose, the passage tells us, such as "toute prose d'écrivain fastueux […] vaut en tant qu'un vers rompu, jouant avec ses timbres et encore les rimes dissimulées."[185] The precise construction is significant. The verb *valoir* ("to be valid as") confers a classificatory judgment, placing this prose—let us call it "prose verse"—within the same genre as the broken line (*le vers rompu*). The conjunction *en tant que* ("insofar as it is") assumes an aspect shared between the elements conjoined. This aspect allows us to understand the first element within the more established terms of the second. "Insofar as it is," to be sure, is not "is"; Mallarmé does not fully dissolve this prose into the broken line. Such a statement would introduce the problem of the line, a precise measure, for which Mallarmé has not, in this text, established any prose equivalent. What Mallarmé says is, rather, that prose verse operates as the broken line does, using an aspect proper to both of the elements conjoined by *en tant que*. This aspect is stated: "jouant avec ses timbres et encore les rimes dissimulées." That which distinguishes this prose from all prose is, or at least can be (for we do not know if the aspect stated is singular or merely an illustrative example) the play of timbres and rhymes.

[185] "La Musique et les Lettres," *OC II*, p. 64.

These rhymes are "hidden" (*dissimulées*) because the measure of the line no longer announces when they will fall. Mallarmé's recognition of such rhyme in French is also worth noting: for, prior to the separation, Mallarmé had admitted no such possibility. Rhyme, though endowed with particular and extraordinary powers in French verse, was absolutely tied to the line, metrically defined. A French reader might perceive the alexandrine to be "dévoré tout entier comme si cette fulgurante cause de délice y triomphait jusqu'à l'initiale syllabe," but the Mallarmé of 1887 argues that, in fact, a rhyme "ne fait qu'un avec l'alexandrin."[186] It is not rhyme that makes the line, but the line that makes the rhyme. After the separation, however, rhyme is no longer "one with the alexandrine"; rhymes may be "hidden"; rhymes appear in prose.

"Verse," then, it would seem, admits of at least two definitions. It may be language ordered by meter into the unit of a line, or it may be language that plays with timbre and rhyme. Language can demonstrate one or the other of these behaviors and constitute verse; it may also demonstrate both. The definitions are not mutually exclusive. Prose verse cannot avail itself of the metrical line, but metrical verses can certainly make use of timbre and rhyme. Indeed, they are better when they do: "Là est la suprématie de modernes vers sur ceux antiques," Mallarmé contends, "formant un tout et ne rimant pas."[187] Rhyme is not necessary to metrical verse, at least not in all languages, but it is preferable.

Timbre, too, appears within the confines of meter. "Les fidèles à l'alexandrin, notre hexamètre," Mallarmé writes in "Crise de vers," "desserrent intérieurement ce mécanisme rigide et puéril de sa mesure; l'oreille, affranchie d'un compteur factice, connaît une jouissance à

[186] "Solennité," *OC II*, pp. 199-200. The text was first published in February 1887 and was later included in *Vers et prose*.
[187] "Solennité," *OC II*, p. 201.

discerner, seule, toutes les combinaisons possibles, entre eux, de douze timbres."[188] The play of timbre can and does take place within the confines of the metrical line. Yet it seems, at least here, that timbre can suffer from the excessively "rigid and puerile mechanism" of the alexandrine, or more precisely its "measure"—which is one meaning of the word "meter." The play of timbres becomes apparent to the ear only when that ear has been "liberated from a gratuitous inner counter." By Mallarmé's account, timbre and meter would appear to be engaged in a certain rivalry, just as rhyme and meter are. But while Mallarmé, in 1887, insisted upon the supremacy of meter over rhyme, in 1897, his sympathies seem to align with "timbre."

A "timbre," though not explicitly defined, is established here as occurring twelve times within an alexandrine; its length therefore is, or can be, equal to that of a syllable. We might provisionally say that a "timbre," in Mallarmé's vocabulary, consists of a vowel or diphthong optionally flanked by accompanying sounds—or, consonants. A relation emerges: a timbre is the minimal element required to form a rhyme. Poor rhyme requires, at minimum, the matching of two vowel timbres; there is no rhyme in French that does not involve timbre. If there can be no play of rhyme without a play of timbre, our second definition of verse may be simplified further still. Thus: verse may be language ordered by meter into the unit of a line, or verse may be language that plays with timbre.

But what, more precisely, does it mean to "play with timbre"? Mallarmé offers an extended reflection on the topic in "Crise de vers." The dating of the passage is, again, significant. Absent from the 1892 essay "Relativement au vers," a prototype for "Crise de vers" that appeared in *Vers et prose*, the paragraph on timbre appears for the first time on September 1,

[188] "Crise de vers," *OC II*, p. 206.

1895.[189] Which is to say, after the separation. It then reappears, in its definitive form, in "Crise de vers," an essay whose title, like its paragraph on timbre, announces a significant development in its author's understanding of verse. The passage is well known:

> … mais, sur l'heure, tourné à de l'esthétique, mon sens regrette que le discours défaille à exprimer les objets par des touches y répondant en coloris ou en allure, lesquelles existent dans l'instrument de la voix, parmi les langages et quelquefois chez un. À côté d'*ombre*, opaque, *ténèbres* se fonce peu ; quelle déception, devant la perversité conférant à *jour* comme à *nuit*, contradictoirement, des timbres obscur ici, là clair. Le souhait d'un terme de splendeur brillant, ou qu'il s'éteigne, inverse ; quant à des alternatives lumineuses simples — *Seulement*, sachons *n'existerait pas le vers* : lui, philosophiquement rémunère le défaut des langues, complément supérieur.[190]

The clash described here takes place between elements like in kind: the "coloring or bearing" (*coloris ou allure*) of "objects" and the coloring or bearing that "exists in the instrument of the voice, amongst languages, and sometimes within one." The specific vehicle through which this coloring or bearing appears in the voice, and in language, is "timbre," as evidenced by the poet's dismayed lament, "what a disappointment, before the perversity that makes the timbres of *jour* and *nuit*, contradictorily, dark in the first case, bright in the second."[191]

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[189] The paragraph first appears in "Averses ou critique" in *La Revue blanche* (*OC II*, p. 1643).
[190] "Crise de vers," *OC II*, p. 208.
[191] While *jour* is certainly "day" and *nuit* "night," a slight slippage in translation is worth noting. The French word *jour*, unlike its English counterpart, may in some instances be used synonymously with *lumière* (light). In French, one can *laisser entrer le jour dans une pièce*, but in English one cannot "let the day into a room," one can only "let the light in." Thus the opposition between *jour* and the "dark" timbre Mallarmé attributes to it is a more symmetrical in French than it is in English. In his reflections on the two terms, Gérard Genette suggests that the same may be said of *nuit* in relation to *obscurité* (darkness), though only by way of metaphor; he offers the example of *la nuit du tombeau* ("the darkness of the tomb"). The expression, Genette explains, does not indicate that the tomb is devoid of light, nor that it somehow possesses "night-time"; rather, it makes use of the literary metaphor by which darkness is equated with death; hence "the death of the tomb." ("Le jour, la nuit," *Cahiers de l'Association internationale des études francaises*, 1968, N°20, p. 155). The necessity of passing by way of "darkness" here seems dubious; it would seem that the passage from *la nuit du tombeau* to *la mort du tombeau*

The vehicle through which coloring or bearing manifests itself in objects is more obscure. This is at least partially due to the fact that the "objects" of Mallarmé's formulation are not precisely objects in the conventional sense of "things in the world." The "objects" that Mallarmé cites are more accurately "facts of nature" or even "natural occurrences" (*faits de nature*) understood from an anthropocentric perspective and structured by the semantic divisions of the terms that designate them (*jour*, *nuit*). Thus, they are not precisely objects in the world, nor explicitly linguistic constructs; they are indifferent to the distinction. A pre-Saussurean thinker, Mallarmé does not make the three-fold distinction between the word (the signifier), the linguistic construct (the signified), and the thing in the world (the referent). For Mallarmé, there is only "the term" (the signifier) and "the object" that refers indifferently to the linguistic construct and the referent.[192] In what is probably the best known passage in his entire oeuvre[193], the passage directly preceding the reflection on *jour* and *nuit*, Mallarmé articulates the source of the "objects" to which he refers:

> Les langues imparfaites en cela que plusieurs, manque la suprême : penser étant écrire sans accessoires, ni chuchotement mais tacite encore l'immortelle parole, la diversité, sur terre, des idiomes empêche personne de proférer les mots qui, sinon se trouveraient, par une frappe unique, elle-même matériellement la vérité. Cette prohibition sévit expresse, dans la nature (on s'y bute avec un sourire) que ne vaille de raison pour se considérer Dieu ; [194]

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might be made more convincingly by way of the analogy between the cycle of the day and the life of a human.

[192] See Gérard Genette, "Le jour, la nuit," *Cahiers de l'Association internationale des études francaises*, 1968, N°20, p. 158; as well as Jean-Claude Milner's "Mallarmé Perchance," pp. 87-9.

[193] Largely, though hardly exclusively responsible for this critical legacy is Walter Benjamin's quotation of the passage in "Die Aufgabe des Übersetzers" (The Task of the Translator), the foreword his translation of Charles Baudelaire's *Tableaux Parisiens* (Frankfurt am Main: Suhrkamp, [1923] 1963) pp. 17-8.

[194] "Crise de vers," *OC II*, p. 208.

The barrier encountered here arises from the human will to express thought in linguistic form. Thought, described as "writing without accessories, nor whispers," precedes any putting into language. It is in the effort to articulate "immortal speech" (*l'immortelle parole*) that the thinking being runs up against a "prohibition." That prohibition stands not against uttering words that would correspond perfectly to an objective reality, but upon uttering words that would materialize one's own thought.[195] Only one thinker gets to do that, Mallarmé notes with a smile: God. "This prohibition rules precisely, in nature (one brushes up against it with a smile) so that no one has any reason to consider himself God." God does not exist for Mallarmé at this point, hence the passage's initial assertion that "the supreme [language] is lacking." The supreme language, for Mallarmé, is not lost, broken or forgotten, it is simply "lacking." It does not exist and never has—except, of course, as a "Chimère, y avoir pensé atteste."[196]

In the supreme language, objects, understood in Mallarmé's sense, correspond perfectly with expression. This correspondence is not attested as a whole, but one catches glimmers of its possibility now and again, by which to infer what it would be. These glimmers appear not just in language, but in many forms of human expression, and when he spots them, Mallarmé tends to call them "poems." Hence his confession that "je ne m'assieds jamais aux gradins des concerts, sans percevoir parmi l'obscure sublimité telle ébauche de quelqu'un des poèmes immanents à

[195] Maurice Blanchot disagrees on this point. In his reading, the supreme language Mallarmé describes would be one in which language coincides with "la réalité des choses": a reality inaccessible to language because language can only ever partake of "cette réalité fictive qu'est le monde humain" (*L'Espace littéraire*, Paris: Gallimard, 1955, p. 32 fn). The textual basis for Blanchot's separation and implied hierarchy between "the reality of things" and "this fictive reality which is the human world" is not stated, and, indeed, dubious. Mallarmé would seem to be interested in "the reality of things" only insofar as it *is* mediated by humans: he writes in "Crise de vers," for example, that "Parler n'a trait à la réalité des choses que commercialement : en littérature, cela se contente d'y faire une allusion ou de distraire leur qualité qu'incorporera quelque idée" (*OC II*, p. 210).

[196] "Crise de vers," *OC II*, p. 211.

l'humanité ou leur originel état, d'autant plus compréhensible que tu,"[197] or his account of a ballet dancer as a "poème dégagé de tout appareil du scribe."[198] For Mallarmé, these "poems immanent to humanity" are nothing less than that by which "humanity" can be said to exist at all. Like the constellations that exist only by means of the viewer who, in one and the same act, both reads and writes them,[199] "poems" constitute the sign by which the human being evidences and asserts the very category of "humanity."

Many arts afford glimmers of this sign, but for Mallarmé, it is ultimately language that holds the greatest potential to realize it. "[C]e n'est pas de sonorités élémentaires par des cuivres, les cordes, les bois," he writes emphatically, "indéniablement mais de l'intellectuelle parole à son apogée que doit avec plénitude et évidence, résulter, en tant que l'ensemble des rapports existant dans tout, la Musique."[200] The greatest hope of realizing the "totality of the relations existing in everything"—and "everything," for Mallarmé, includes humanity—lies in "intellectual speech at its apogee." And "intellectual speech at its apogee," is, or at least can be, "verse":

> Ainsi lancé de soi le principe qui n'est — que le Vers ! attire non moins que dégage pour son épanouissement (l'instant qu'ils brillent et meurent dans une fleur rapide, sur quelque transparence comme d'éther) les mille éléments de beauté pressés d'accourir et de s'ordonner dans leur valeur essentielle. Signe ! au gouffre central d'une spirituelle impossibilité que rien ne soit exclusivement à tout, le numérateur divin de notre apothéose, quelque suprême moule n'ayant pas lieu en tant que d'aucun objet qui existe : mais il emprunte, pour y aviver un sceau tous gisements épars, ignorés et flottants selon quelque richesse, et les forger.[201]

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[197] "Crise de vers," *OC II*, p. 213.
[198] "Ballets," *OC II*, p. 171.
[199] See J.-C. Milner, "Les constellations révélatrices," *Elucidations* 8-9 (Winter 2003-4), p. 3.
[200] *OC II*, p. 212. For Mallarmé, "Music" with a capital M is clearly distinguished from "music" the art form; 'Music' is synonymous with Chimera, Idea, "poem immanent to humanity," or what we have referred to as a "sign" of humanity. On this point, see Philippe Lacoue-Labarthe, *Musica Ficta : Figures de Wagner*, Paris: Christian Bourgois, 1991, pp. 91-160.
[201] "Solennité," *OC II,* p. 200.

The "Verse" of this passage, to be sure, is verse in meter: the words whose recitation prompts it are explicitly "appareillés d'après une métrique absolue."[202] The "drawing inward" and "releasing" of the "thousand beautiful elements" described as "hurried" suggest linguistic elements engaged in a sort of tension with time, "rushing" into an "order" dictated by "their essential values." The instant that order is attained is also the instant it perishes: "the instant they shimmer and die in a rapid bloom." But the instant, brief as it may be, is nonetheless a "Sign," furnished by the "absolute meter," attesting to "some supreme mold that does not exist as any object." The supreme mold, like the supreme language, attests to a human vision of language ordered in a non-arbitrary, "absolute" way. Borrowing from the world of objects "scattered ore, unclaimed and floating like riches," the absolute meter restores the order that is absent in words spoken without it. It will "burnish a seal"; in the terms of the passage with which we began, we might say that it "philosophically remunerates the deficiency of languages, superior complement." What is the deficiency (*défaut*)? Implicitly, the order in which the elements find themselves before they "rush," at the impetus of the absolute meter, into their "essential" order. There are, in other words, two orders: "brut ou immédiat ici, là essentiel."[203]

This passage, first published in February 1887, dates from before the separation; it appears in *Vers et prose*; it gives no indication that anything besides "absolute meter" could generate the vibrant tension it describes. But the "verse" that appears in "Crise de vers"—the verse that explicitly can "remunerate the deficiency of languages"—is not described in terms of meter, absolute or otherwise. That without which "*verse would not exist*" is articulated in entirely different terms. By 1897, "verse" has been reconfigured into something that we have yet to grasp.

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[202] Ibid, p. 200.
[203] "Crise de vers," *OC II*, p. 212.

III. "en coloris ou en allure"

That without which verse would not exist is articulated in terms of a tension between the wish for a term endowed with certain properties and an encounter with a term lacking those properties, wholly or partially. While the sonic properties of *nuit* and *jour* seem to be fully opposed to the degrees of brightness inherent in the meaning of those terms, *ombre* constitutes an instance of partial correspondence, implying an object nearly as dark as the "opaque" timbre Mallarmé perceives it to bear. The properties inherent in objects and in the voice thus admit of degrees; "opaque" and "not very dark," are not binary and oppositional, but rather degrees of realization of the same quality, measured along the same axis. If the degrees of realization were always to correspond, verse would not exist; so would it cease to exist in the absence of the potential for correspondence. The potential for correspondence resides in the existence of the common axis: a property common to both objects and language.

That property seems to be of capital importance. Let us take a closer look at what it might be. To begin with, Mallarmé articulates it not as one property, but as two. The voice has the capacity to correspond to objects either *en coloris ou en allure*—in "color or movement,"[204] or perhaps, "shading or bearing."[205] He offers four examples of insufficient correspondences, all four of which are discussed in relation to the axis of "brightness." And "brightness" is not precisely "color," "coloring," "movement," "bearing," or "shading"—though this last term certainly seems to come the closest.

[204] Rosemary Lloyd translation, in *Mallarmé: The Poet and His Circle*, Ithaca: Cornell UP, 1999, p. 230.
[205] Barbara Johnson translation, in *Divagations*, Cambridge: Harvard UP, 2007, p. 205.

Coloris, derived from the Italian *colorito,* began as a painting term, and is first attested in reference to Leonardo da Vinci in the late fifteenth century. The masculine substantivization of *colorire* "to color," it shares a root with *colore* "color." *Coloris* appears in French in 1675,[206] denoting the "manner of using and manipulating colors, and, *by metonymy*, the effect obtained."[207] In this metonymic usage, *coloris* differs from *couleur* in referring to an overall palette, implying an art of selection, combination, and balance. "[C]haque artiste a son style," Hippolyte Taine writes in 1865, "Si c'est un peintre, il a son coloris, riche ou terne, ses types préférés, nobles ou vulgaires, ses attitudes, sa façon de composer." Or, in 1911, Gabriel Séailles: "Ce qui fait dans un tableau la beauté du coloris, ce n'est ni la variété, ni la richesse des tons isolés, mais c'est leur harmonie."[208] In the extensions of *coloris* into music and literature, only metonymic usage is retained; in music, *coloris* refers to "l'effet résultant de l'emploi des instruments, des sons, des timbres" and in literature, to the "tonalité générale d'une oeuvre."[209] In reference to people, the term notes an "[é]clat du style qui permet de le comparer aux reflets de la peinture": one might, for example, take note of "le vrai coloris de son âme guerrier." *Coloris* need not always point toward the truth, however; *coloris* can also lead one astray, as in the case of that which parades "sous un coloris de candeur."[210]

Of these definitions, the one that lends itself most readily to Mallarmé's text is the metonymic use of the term as extended into the realm of music: "the effect resulting from the use

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[206] "coloris," *Dictionnaire historique de la langue française* ed. Alain Rey, Paris: Le Robert, 1993. p. 450.
[207] "coloris," *Trésor de la langue française* ed. Paul Imbs*,* Vol 2, Paris: CNRS, 1973, p. 1068.
[208] Taine, *Philosophie de l'art*, I, 1865, p. 2; G. Séailles, *Eugene Carrière, essai de biographie psychologique*, 1911, p. 56. Cited in *Trésor de la langue française*, p. 1068.
[209] *Trésor de la langue française*, p. 1068.
[210] "coloris," *Dictionnaire de la langue française* ed. Émile Littré, Vol. 6, Versailles: Encyclopedia Britannica, 1994, p. 1009.

of instruments, sounds, and timbres."[211] The precise construction of Mallarmé's sentence reinforces this reading: *coloris* does not exist "dans la voix," but indeed, "dans l'instrument de la voix." Thus, we might say that *coloris* refers to the qualities of the voice that it shares with musical instruments: its sounds and timbres.

While *coloris* clearly inheres in the voice, and thus refers to sound, the term nonetheless continues to assert its origins in painting through the word *touches*: "touches,"[212] "marks,"[213] and "piano keys," but also, notably, "brush strokes."[214] For it is, we recall, "par des touches y répondant en coloris ou en allure" that the poet wishes language might align with objects.

The discussion of musical timbre in terms of color bears a precedent in Mallarmé, in the poet's 1885 ruminations on Richard Wagner. Here, the poet writes of

> … une musique qui n'a de cet art que l'observance des lois très complexes, seulement d'abord le flottant et l'infus, confond les couleurs et les lignes du personnage avec les timbres et les thèmes en une ambiance plus riche de Rêverie que tout air d'ici-bas, déité costumée aux invisibles plis d'un tissu d'accords.[215]

The parallel construction created between the "colors and lines of the character" (*les couleurs et les lignes du personnage*) and the "timbres and themes" (*timbres et thèmes*) of the opera suggests a correspondence, in Mallarmé's mind, between color and timbre on the one hand, line and theme on the other. But the Wagnerian "deity costumed in the invisible folds of a cloth of chords," falls short of the mark. Like the alexandrine shackled by a "gratuitous inner counter," it partakes of music "only in its observance of very complex laws," and instead of aligning the

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[211] Ibid.
[212] Barbara Johnson translation, in *Divagations*, Cambridge: Harvard UP, 2007, p. 205.
[213] Rosemary Lloyd translation, in *Mallarmé: The Poet and His Circle*, Ithaca: Cornell UP, 1999, p. 230.
[214] "touches," *Trésor de la langue française.*
[215] "Richard Wagner: Rêverie d'un poëte français," *OC II*, p. 156. First published in *La Revue wagnérienne*, 8 August 1885.

correspondences between colors and timbres, lines and themes, it "confuses" them. "Tout se retrempe au ruisseau primitif," Mallarmé concludes dismissively, "pas jusqu'à la source."[216]

Both the context of Mallarmé's oeuvre and in that of the passage at hand, then, suggest we read the term *coloris* as we read *crise*, which is to say, doubly: as the sound of the voice insofar as it is like that of a musical instrument—its sounds and timbres, but also as the overall palette that results from a painter's use and manipulation of colors. Or, in the words of Séailles, "neither the variety nor the richness of the isolated tones, but their harmony."

And *allure*? First attested in French in 1170 as *aleure*, the term first designated "speed of movement, walking," and is a derivative of the verb *aller* ("to go"). Used particularly to describe the gaits of horses—walking, trotting, galloping—the term can also be used in reference to the gaits of other creatures, including humans, as well as the progress of the sun. English translations in this sense might include "speed," "rate," or better still, "pace." Used figuratively, *allure* can also refer to the general aura of people or things, as well as the overall pace or rhythm of a work of art; hence Saint-Beuve's 1828 observation, with regard to Du Bellay's poetry, "On y est frappé, entre autres mérites, de la libre allure, et en quelque sorte de la *fluidité* courante de la phrase poétique, qui *se déroule* et *serpente* sans effort à travers la sinuosité de la rime."[217] The metaphorical extensions of the term are not limited to works of art, however; Paul Valéry, in 1931, will explain, "Ce fonctionnement assurera la *marche régulière* de notre établissement, ce qu'on peut nommer son allure de régime."[218] In twentieth century phonetics, the term serves as the technical designator for the speed or rhythm of speech: "l'allure *de l'énoncé* (dit aussi parfois

[216] Ibid., p. 157.
[217] *Tableau historique et critique de la poésie française et du théâtre français au XVIe siècle,* p. 60; cited in Paul Imbs, ed*.,* "allure," *Trésor de la langue française,* Vol. 2, Paris: CNRS, 1973, pp. 593-5.
[218] Valéry, *Regards sur le monde actuel*, 1931, p. 309; cited in "allure," *Trésor*, pp. 593-5.

mouvement). […] selon qu'elle est lente […] ou rapide […] ou saccadée […] peut être invoquée pour expliquer certains traitements phonétiques exceptionnels."[219] It is time, perhaps, to reconsider our translation of *allure*. While the English "pace" or "pacing" bears the advantage of the walking movement at the origin of the French term, it lacks any capacity to suggest the "staccato" rhythm of the technical designator. The best term available, then, though hardly a perfect translation, would seem to be "rhythm."

The two properties Mallarmé identifies as common to objects and language are thus quite distinct. Although we cannot say with certainty what they are in "objects," we can say with considerable precision what they are in the voice. The first, coloring, refers to the sounds and timbres of the voice; the second, rhythm, references the pacing and accentual distribution of utterances. As to the category to which Mallarmé's examples pertain, we have little choice but to say "coloring." For while "brightness" is not precisely "coloring," it is "rhythm" even less.

Thus, the answer to the question, 'What is that without which verse would not exist?' is dual in nature. There are two answers. Mallarmé explains one of them in considerable detail: it is the tension that arises between one's desire for a term with a particular coloring and one's encounter with a term lacking that coloring. The desired coloring is the one inherent in the object named and inheres in meaning; the encountered coloring is that of the timbre in the term pronounced and inheres in linguistic sound. This is the answer afforded by *coloris.* Let us call it the *tension of timbre.*

The second answer lies in the term *allure*. Considered beside the numerous examples provided to illustrate "coloring," the lack of explanation with regard to "rhythm" suggests that the author assumes the matter to be self-evident. He does not explain it. We know of its presence

[219] "allure," *Trésor*, Vol. 2, pp. 593-5.

only because of the inclusion of "allure" in the expression "en coloris ou en allure." And because, in the line directly following the passage under consideration, Mallarmé names it. Concluding his reflection on the desire, necessary to verse, to make the coloring of meaning correspond with the coloring of sound, he writes, "Arcane étrange; et, d'intentions pas moindres, a jailli la métrique aux temps incubatoires."[220] The second answer is meter.

For meter also generates a tension in language; meter also awakens a human desire to see fragments of language "s'ordonner dans leur valeur essentielle."[221] Those values, in the case of meter, are not colored, but rhythmic—they have to do with speech sounds' succession in time. If the tension of timbre may be defined as the tension that arises from a discrepancy between one's desire for a term of a particular hue and one's encounter with a term of a different color, metrical tension might be described as the tension that arises between one's desire for an expression with a particular rhythm and an encounter with an expression lacking that temporal structure.

Prior to the drafting of his Taylorian lecture in the winter months of 1894, the only aspect of language Mallarmé recognizes as capable of stamping the forger's seal upon an utterance to make it verse is meter. From March 1, 1894 onward, however, "verse" admits of two definitions. It may be language ordered by meter into a line, or it may be language that engages the tension of timbre.[222]

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[220] "Crise de vers," *OC II*, p. 208.
[221] "Solennité," *OC II*, p. 200.
[222] Despite the prominence of the passage on *jour* and *nuit,* the inclusion of this second term within Mallarmé's conception of verse has been overwhelmingly overlooked. See, for example, Philippe Lacoue-Labarthe's argument that Mallarmé's "verse" may be reduced to "a principle of rhythm": an argument Lacoue-Labarthe is able to maintain only by excising the passage on timbre entirely (*Musica Ficta*, pp. 91-160, and particularly 155-9).

IV. A Theory of Verse

Let us return, once more, to the passage. Can we really say that there are two, and only two, answers to the question 'What is that without which verse would not exist?' The difficulty, to begin with, is one of syntax. The verb of the italicized warning appears in the conditional: "*verse would not exist*." It seems to partake of hypothetical if-then structure, such as one typically finds in the form "If X __, then Y___." But the first clause is missing. X, therefore, remains an enigma. We infer from the context that the missing clause concerns the wish articulated at the beginning of the sentence: "The wish for a term of brilliant splendor, or for a dark one, the opposite." The missing clause, we hypothesize, would be "If that wish were realized." Thus, "If we had a term of brilliant splendor, or for a dark one, the opposite, *verse would not exist*."

This seems reasonable enough. But taken literally, it would imply that meter is not capable, on its own, of creating verse. In this reading, verse resides on one aspect of language and one aspect alone: the tension of timbre. Which is manifestly false.

Might we, then, read the missing clause in a different sense? Perhaps by taking into account the component of the sentence that we have thus far ignored: "as for the simple examples of brightness"? This phrase, which refers to the desired "term of brilliant splendor" and its dark opposite, reduces those entities to illustrations of a general idea. We have assumed this idea to be the tension of timbre. But the categories to which the examples pertain are multiple: they are "simple examples of brightness," of which other examples might be, and indeed have been, offered; but the principle of "brightness," according to our current understanding, is itself but an example of the larger category of "coloring." This categorization, however, was made

only reluctantly; "brightness" was said to partake of "coloring" only because it could not be assimilated into "rhythm."

But might not "coloring" and "rhythm," too, partake of a larger category, a category into which "brightness" might more comfortably fall? For just as we read the "term of brilliant splendor" and its opposite as indications of a general principle, so might we also read "coloring or rhythm" as examples pertaining to a shared category. By this reading, that without which verse would not exist might be understood in terms of a single principle, of which rhythm, coloring, and brightness are three examples. They are not even, necessarily, the only possible examples. Nothing in Mallarmé's syntax, when thus understood, precludes the possibility of yet other linguistic phenomena capable of instantiating the principle they enact in verse.

So what is the principle? It would have to partake of that which is structurally common to the tension created in language by meter and by timbre. Let us return to the two passages that describe these experiences: "Solennité" and "Crise de vers."

The force that drives the passage on meter is the listener's perception, and expectation, of an order to be realized: the "thousand beautiful elements," we read, "rush together and order themselves in accordance with their essential values." We understand this "order" to be that of the "absolute meter"; it operates in accordance with the elements' "essential values." Referred to as the "divine numerator of our apotheosis," this order partakes of a system based on number. Placed in parallel with—even, arguably, granted the appositive of—"some supreme mold that does not exist as any object," it also partakes, unmistakably, of the supreme language. This supreme order exists in a state of tension with another force: it "draws in" and "releases"; the elements are "hurried"; they "rush." In moving to the meter, the earthly language reveals the presence of other constraints against which it must work. We infer these constraints to be those

that govern language not in meter: the rhythm and word order governed less by sound and more by syntax. The particularity of the experience of meter seems to lie not only in an awareness of the realized metrical order, then, but also in a heightened awareness of this other, unrealized order: the one dictated by sense. The second order, although ever present in non-metrical speech, is usually unconscious because unchallenged; meter, whether it actually disrupts this order or not, introduces the possibility of disruption. And it is the possibility, not the disruption, that creates the tension constitutive of verse. Metrical verse awakens the speaking being's awareness of the arbitrary rhythms of everyday speech: the pauses and groupings that have been uttered so often as to seem necessary, inviolable, and absolute. Meter, in furnishing another order, exposes the contingency of the one that was already there.

The same might be said of the passage on timbre. It, too, asserts the existence of an order intrinsic to language: an order that stands at odds with the order inherent in everyday usage. It, too, resides on a human expectation of the linguistic element. Only someone who expects a particular timbre can be "disappointed" "before the perversity that makes the timbres of *jour* and *nuit*, contradictorily, dark in the first case, bright in the second." This perversity reigns in non-verse, but no one particularly notices because no one thinks to expect otherwise. That which distinguishes the experience of timbre as recounted by Mallarmé is merely the heightened perception of an order intrinsic to linguistic sound—this time articulated not in terms of rhythm, but in terms of brightness—that is different from the order governing non-verse. Timbre, in offering a glint of this order, reveals the arbitrary nature of the one governing everyday speech.

What distinguishes verse from non-verse would appear to be nothing more than an idea of order: an awareness of the arbitrary principles governing everyday speech, coupled with a desire to replace these principles with non-arbitrary ones. Both the awareness and the desire are

generated by the emergence of the non-arbitrary order, internal to language, that holds the potential to disrupt the mechanisms governing non-verse. For Mallarmé, this other order is singular and absolute: it is the order of the supreme language. Its singularity is implied by the singularity of the "supreme mold" in the passage on meter,[223] and by that of "the supreme one" in the passage on timbre.[224] Mallarmé simply assumes that the "essential values" of the elements will be universally perceived and uncontested, just as he assumes his readers will hear *jour* as dark and *nuit* as light. The idea that some fortunate soul might perceive the timbre of *jour* as something other than dark does not appear to cross his mind, any more than the possibility that someone might think of days as dark. Because there is only one supreme language, the values accorded its timbres are universal and not specific to the phonology of any single language. Thus, the supreme language, for Mallarmé, is in no way particular to French. It inheres "amongst languages"; it is "absolute."[225] The principle of verse based in a relation to the supreme language therefore defines not only French verse, but all verse.[226]

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[223] "quelque suprême moule n'ayant pas lieu en tant que d'aucun objet qui existe" ("Solennité," *OC II*, p. 200).

[224] "Les langues imparfaites en cela que plusieurs, manque la suprême ..." ("Crise de vers," *OC II*, p. 208).

[225] It is interesting to note that from the perspective of modern linguistics, Mallarmé's formulation is asymmetrical. For timbre inheres in vowel *sounds*, rather than vowels as such; which is to say, measurements of timbre consider language in acoustic, rather than linguistic terms. Timbre is therefore universal, not language-specific. Meter, on the other hand, is language-specific: organizing a language by means of phonological units, meter necessarily differs in accordance with the phonology of the language at hand; hence the syllabic-accentual meters of English, the quantitative classical meters, the syllabic meters of French, the tonal meters of Chinese, and so on. In Mallarmé's formulation, however, there is such a thing as an "absolute meter." This meter seems to refer to that by which "meter" can be said to constitute a category across languages. Yet a definition of meter that makes no reference to phonology seems difficult to formulate; one would begin, presumably, with the principle of number.

[226] This orientation, manifest throughout Mallarmé's theoretical texts, is also discernible in his correspondence. In setting a title for his Taylorian lecture of 1894, for example, Mallarmé first proposes the title "Les Lettres et la Musique." The English organizers, gently reminding him that the event will form part of a lecture series on "French Literature," respond by requesting that the

For Mallarmé, then, verse exists as soon as a speaking being is sensitive to the existence of the supreme language: as soon as that being, expecting it, can be "disappointed" by the sounds that comes in its stead. This seems to be the fundamental difference distinguishing verse and non-verse: the tension installed in language by its non-correspondence with the supreme one. This tension is premised merely on an idea of the supreme language in language. It resides, therefore, on a "Chimera, attested in our having thought of it."

The poet can attain the supreme language, in a way, in the metrical line. The metrical verse in "Solennité" does achieve its "full flowering" and the "thousand beautiful elements" do, at that instant, align to form a "Sign!" Whether the poet can attain the supreme language through the tension of timbre is less clear. Mallarmé does not offer us any such gratifying moments of alignment when it comes to timbre; the closest he comes to providing an example of fulfilled correspondence is the rather lackluster example of "*ombre*, opaque." It is not even clear, in the case of timbre, over what unit the poet would make the timbres of sense correspond with those of sound. In the case of meter, the unit was the line; but after the separation, the line has been withdrawn. A timbre inheres in a single syllable, we know, from Mallarmé's mention of the "twelve timbres" of the alexandrine; and a single timbre can color an entire word, even one of multiple syllables (*ténèbres*). But the unit over which the poet's timbres could attain a perfect correspondence of sound and sense, conquering the "perversity" that mis-assigned them, remains entirely obscure.

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word "français" figure in the lecture title. Although Mallarmé's response to this request is now lost, it is attested by Oxford tutor Charles Bonnier's response to it. Bonnier confirms that Mallarmé's lecture has been announced, in accordance with the author's wishes, as "Les Lettres et la Musique." The absence of any national or linguistic marker in the title thus appears to have been not only considered, but indeed, insisted upon (*Correspondance de Stéphane Mallarmé* ed. Henri Mondor and Lloyd James Austin, Vol. 6, Paris: Gallimard, 1981, p. 176; *OC II*, p. 1599).

In what sense then, we might well ask, can the play of timbre be said to constitute verse? For verse, in Mallarmé, negates chance. That is its role. As Gérard Genette, amongst many others, observed half a century ago, Mallarmé "assigne au langage poétique la tâche précise de supprimer, ou plus exactement de donner l'illusion qu'il supprime l'arbitraire du signe linguistique."[227] In the poet's own words, it is "[l]e vers qui de plusieurs vocables refait un mot total, neuf, étranger à la langue et comme incantatoire […] niant, d'un trait souverain, le hasard demeuré aux termes …."[228] If the tension of timbre does not do this, what does it do?

Mallarmé tells us: it "remunerates the deficiency in languages."[229] The formulation merits a moment's reflection. For despite the resemblance by which *rémunérer* has, for centuries, been misspelled in both French and English as *rénumérer* ("renumerate"), the verb bears no reference to number and thus, no reference to meter. And despite the superficial similarity by which it might be taken as synonymous with "giving the impression of suppressing the arbitrary nature of the linguistic sign," to "remunerate the deficiency in languages" is not to "eliminate chance," nor even to "negate" it.

In order to read the expression *rémunère le défaut des langues* as synonymous with *nier le hasard* we would have to understand *le défaut des langues* as "chance" and *rémunère* as "negate." The word *défaut*, however, suggests an absence, not a presence; the word is defined as "the absence of a thing or person whose presence is necessary or desirable (generally, for the formation of a coherent whole)."[230] Chance is not absent in languages, but present; its presence is not necessary or desirable—on the contrary, it inspires "regret." The equation *le défaut des*

[227] Genette, "Le jour, la nuit," p. 160. See also Roman Jakobson, "Linguistics and Poetics," *Selected Writings III*, ed. Stephen Rudy, The Hague: Mouton, 1981, pp. 44-5.
[228] "Crise de vers," *OC II*, p. 213.
[229] "rémunère le défaut des langues" ("Crise de vers," *OC II*, p. 208).
[230] "défaut," *Trésor de la langue française*.

langues = *hasard* is therefore imprecise. That which is "absent," but whose presence would be "desirable," is not *le hasard*, but *la suprême*. It is not chance that is lacking in languages; it is the supreme language.

The question, then, is what distinguishes *rémunérer l'absence de la langue suprême* from *nier le hasard.* The verb *rémunérer* is primarily an economic one; it means "to pay someone a sum in exchange for work or services rendered."[231] In the medieval period, it carried a strong religious connotation, as *le rémunérateur* was another name for God: he who rewards Christian virtue.[232] In both economic and religious usage, the structure of the verb involves two steps, two parties, and two elements: an initial transaction, in which party one renders a gift, service, or work (element one) to party two, and a second transaction, in which party two compensates party one, typically but not exclusively by means of a financial or spiritual reward (element two). Whether the transactions be religious or economic, an element of faith is required from party one: that party two will carry out the second transaction.

Mallarmé's sentence conforms to a derivative use of the verb, by which element two serves as grammatical subject and "remunerates" the direct object, element one, in the sense of "constitutes the remuneration of,"[233] or, more plainly, "makes up for." In this usage, the parties disappear, causing the transaction take place between elements alone. The giver, be it the economic power that pays or the God that rewards, has been eliminated; so, too, has the laborer or believer. Mallarmé's verb enacts a very simple equation that takes place entirely within language: verse makes up for the absence of the supreme language.

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[231] "rémunérer," *Trésor de la langue française*.
[232] Ibid.
[233] Ibid.

While this formulation does entail a principle of equivalence and a gesture of compensation, its structure does not emphasize, nor even necessarily entail, a "negation." The action entailed in *rémunérer* is clearly distinguishable from that of say, *annuler* or *supprimer*: paying someone for services rendered is not the same thing as canceling the whole transaction. Accounts are settled in both cases, but in the second, nothing will have taken place; in the first, something will. In Mallarméan terms, it is the difference between "RIEN / N'AURA EU LIEU" and "RIEN / N'AURA EU LIEU / QUE LE LIEU". "QUE LE LIEU" acknowledges that something *has* taken place, even when by another measure, nothing has. We need not even reach the possible alignment found within a constellation—which, it bears noting, is not necessary, but optional: "EXCEPTÉ / PEUT-ÊTRE / UNE CONSTELLATION."[234] Even without the appearance of a legible constellation, something will have taken place.

And that which will have taken place is the *rémunération* of language unto itself. Mallarmé's selection of verb to articulate that which verse offers "in return" reveals the impossibility of the initial offering: the prefix *re-* belies the absence of any such verb as *munérer*. The supreme language was never offered, because the supreme language never was; the remuneration is the second transaction to an absent first. The element of faith, therefore, has been eliminated. Unlike the economic equation and unlike the religious one, the remunerative equation that produces verse relies not on faith in a "supreme one," but on the supreme one's absence.[235]

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[234] "Un coup de Dés jamais n'abolira le Hasard," *OC I*, pp. 384-7.

[235] Thus, Mallarmé might well be placed within the history of poetic atheology traced by Giorgio Agamben in his essay "Disappropriata maniera," published as the preface to Giorgio Caproni's *Res amissa*, Milan: Garzanti, 1991, pp. 7-26 (trans. Daniel Heller-Roazen, "Expropriated Manner," *The End of the Poem*, pp. 87-101).

There has been a separation of *le vers*. The line, ordered by meter, negates chance. This is the "antique verse" whose worship Mallarmé maintains in his preface to the *Coup de Dés*; it is the *vers* of the quotation previously cited, which might be better translated not as "verse," but indeed, as "*the line* which from many expressions makes a total, new word […] negating, in a sovereign sweep, the chance that remains in terms …".[236] But the line, for Mallarmé, is no longer synonymous with "verse." The line is but one instance of the greater principle whose defining feature is its capacity to expose the supreme language in language: not necessarily to give the impression of having attained it. Thus, there can be such a thing as a "free verse" (*vers libre*); verse can exist in the absence of the line, "playing with its timbres, and even hidden rhymes." This verse cannot suppress, eliminate, or negate chance. Severed from the line, it can only give a glimmer of the supreme language that it is not, but which we, in noticing, affirm to be.

[236] "Observation relative au poème," *OC I*, p. 392; "Crise de vers," *OC II*, p. 213.

CHAPTER FOUR

L'être imaginaire : On Saussure's Synesthesia

In 1983, the Swiss researcher Mireille Cifali happened upon some drafts of a radio lecture by Édouard Claparède, a Genevan psychologist whose correspondence with Sigmund Freud had occasioned her archival visit. Claparède's lecture, broadcast on February 5, 1936, concerned a book he had assisted in researching over forty years earlier, Théodore Flournoy's *Des phénomènes de synopsie* (1893). The book catalogued and analyzed reports of "extraordinary sensations" submitted by individuals who had experienced "représentations relevant essentiellement du domaine de la vue, provoquées par des sensations ou idées quelconques, en dehors (au moins en apparence) des lois ordinaires de la perception et de l'association."[237] The book, in other words, recounted the experiences of people who saw things that, according to "the ordinary laws of perception and association," were not there.

Apparently compelled to defend the reliability of these reports in his broadcast, Claparède noted the "[r]éponse détaillée de personnes, de savants, à la conscience scrupuleuse, et dont on ne saurait mettre en doute la bonne foi (Cas de Ferdinand de Saussure). Cf. Flournoy, p. 51, luxe de détails."[238] Intrigued at the surprising reference to the founding figure of structuralist linguistics, Cifali contacted Flournoy's grandson Olivier, who located the late author's copy to

[237] Théodore Flournoy, *Des phénomènes de synopsie*, Paris: Alcan and Geneva: Eggiman, 1893, p. 5.
[238] Mireille Cifali, "Présentation," *Le Bloc-Notes de la psychanalyse* 3 (1983), pp. 133-4.

find that the name "Ferdinand de Saussure" had indeed been jotted into the margin beside a long quotation that the printed text, for its part, attributed only to "un éminent linguiste, M. X."[239]

That Saussure should have remained anonymous is in such a study unsurprising. Most of the subjects in Flournoy's study elected to do so, for reasons not difficult to discern. As Marco Mazzeo, one of the text's most acute commentators, usefully summarizes,

> entre la fin du XIXe siècle et le début du XXe, la synesthésie est une affaire scabreuse, terrain de durs affrontements. C'est l'occasion de lourdes accusations entre philosophes, scientifiques et théoriciens de l'art. Qui ne croit pas à la vérité du phénomène attaque l'adversaire sans la moindre hésitation : dans le meilleur des cas, il lui reproche d'être trop facilement impressionnable, dans le pire, on l'accuse de charlatanisme.[240]

Given Saussure's well-documented reluctance to publish even his most developed work—be it the *Cours de linguistique générale* or the anagram notebooks—it is scarcely surprising that he should have refrained from attaching his name to passing observations on so contentious a topic.

The quotation itself, nearly three pages in length, offers an exquisitely detailed description of "la couleur des voyelles." *A,* it recounts, is "blanchâtre, tirant sur le jaune," like "un papier (jauni par le temps) tendu dans un cadre," or perhaps "la coquille d'un oeuf cru." *I* is like mercury, "argent ou vif-argent"; *u* is "acier bleu sombre"; and *ou* evokes the same sensation as "un beau velours gris, ou un beau drap gris très moelleux, très fondu de ton."[241] Although the sensuous materiality of these descriptions contrasts rather sharply with the abstract, even algebraic minimalism characteristic of Ferdinand de Saussure's published prose, the authorship of the quotation, once revealed, could hardly be disputed. Flournoy's longtime colleague at the

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[239] Flournoy, *Phénomènes*, p. 50, cit. Cifali, "Présentation," p. 135. The quotation, announcing Ferdinand de Saussure as author, is reproduced in full in the same issue of *Le Bloc-Notes de la psychanalyse* under the title "Réponse à une enquête sur l'audition colorée" (pp. 137-9).
[240] Marco Mazzeo, "Les voyelles colorées : Saussure et la synesthésie," *Cahiers Ferdinand de Saussure* 57 (2004), pp. 135.
[241] Flournoy, *Phénomènes*, pp. 50-2.

University of Geneva, as well as his social peer,[242] Saussure was certainly a plausible candidate for the "eminent linguist" elsewhere identified in the text as "male, aged thirty-five."[243] And even the most suspicious scholar would be obliged to concede that the quotation itself is marked by distinctively Saussurean terminology.

I say "would be" rather than "was" because the text on vowel colors has not garnered much scholarly attention. Somewhat surprisingly, it has never been republished in the "Documents" section of the *Cahiers Ferdinand de Saussure*, where various fragments of Saussureana regularly appear, and the pages of that journal in the two decades following its

[242] Colleagues at the Université de Genève from 1891 onward, Saussure and Flournoy are known to have collaborated professionally, most famously on the case of Hélène Smith (Catherine Müller): a woman who, in a dreamlike state, spoke a Sanskritoid language she referred to as "martian." (See Giulio Lepschy, "Saussure e gli spiriti," *Studi saussuriani per Robert Godel*, ed. René Amacker, Tullio De Mauro, and Luis J. Prieto, Bologna: Il Mulino, 1974, pp. 181-200, and, more recently, Daniel Petit's "Le langage martien," *LALIES* 35 (2015), pp. 91-105, as well as Flournoy's own publication of the work in *Des Indes à la planète Mars, étude sur un cas de somnambulisme avec glossolalie*, Paris: Alcan and Geneva: Eggimann, 1900). Links tying the two men extend well beyond professional life, however; Saussure and Flournoy were born distant cousins, attended the same schools, and came to be related by marriage when Flournoy's daughter Ariane married Saussure's son Raymond in 1919. The geneaological link between Saussure and Flournoy, and thus between Saussure and Flournoy's cousin Claparède, is relevant here because Flournoy notes that Claparède "possède à un haut degré la plupart des manifestations de l'audition colorée" (Flournoy, *Phénomènes*, p. 2) and synesthesia appears to bear a strong genetic component (see, for example, D. Brang and V. S. Ramachandran's "Survival of the Synesthesia Gene: Why Do People Hear Colors and Taste Words?" *PLoS Biology* 9.11 (2011): e1001205. PMC. Web. 19 May 2017). For more on the biographical links tying Ferdinand de Saussure to Théodore Flournoy, as well as extensive documentation of Saussure's geneaology, see John E. Joseph's biography *Saussure* (Oxford: OUP, 2012).

[243] The printed text identifies M. X. as "*H. 35 ans*" (p. 164). Saussure was born Nov. 26, 1857, and so would have turned 35 in November of 1892; Claparède distributed his survey in May of 1892. The date by which Flournoy and Claparède had collected most responses is noted as "five months later" (Flournoy, p. 12), thus October, but there is no reason to believe that this date constituted a firm deadline. It seems entirely plausible that Saussure's response would have been accepted later, or that his age was calculated exclusively on the basis of birth year, without regard to the month.

discovery betray no trace of its existence.[244] This scholarly silence could be attributable to the limited circulation of *Le Bloc-Notes de la psychanalyse,* the newly founded journal of Freudian studies in which Cifali's discovery was published. It might also reflect a certain exhaustion on the part of Saussurean scholars with anything that could appear to undermine the authority of the *Cours de linguistique générale*. Given the rumors of madness to which Saussure's newly public anagram studies had so recently given rise,[245] it is not difficult to imagine why Saussureans of the 1980s might have been reluctant to take on the vowel-color text. Beyond its suggestion that Saussure was subject to the sort of unverifiable visions that compelled established professionals like Édouard Claparède to defend their work in public broadcasts, the text would also appear to present an inherent connection between elements of language and things in the world, just as the anagram notebooks had,[246] obliging its commentator to reconcile that connection with the arbitrary sign foundational to the *Cours de linguistique générale*.

Although the past two decades have seen a number of scholars endeavor to resolve that apparent contradiction, their commentaries have consistently approached the vowel-color text through the lens of synchronic linguistics*,* protecting the integrity of that science by demonstrating the vowel-color text's compatibility with its foundational principles as advanced in *Cours de linguistique générale*. It is in no way evident, however, that the vowel-color text's

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[244] Only in 2004 did the *Cahiers* make note of the vowel-color text, which is reproduced in full in Mazzeo's "Les voyelles colorées : Saussure et la synesthésie," pp. 132-3.
[245] The anagram notebooks came to scholarly attention primarily through Jean Starobinski's publication of selected excerpts in *Les mots sous les mots* (Paris: Gallimard, 1971); readings imputing mental illness to their author had begun even before Starobinski's book appeared (see Michel Deguy, "La folie de Saussure," *Critique,* No. 25 [1969], pp. 20-6). Reading the anagram notebooks as evidence of Saussure's madness became commonplace in the 1970s, as Ivan Callus's annotated bibliography on the secondary literature attests ("A Chronological and Annotated Bibliography of Works Referring to Ferdinand de Saussure's Anagram Notebooks," *Cahiers Ferdinand de Saussure* 55 (2002), pp. 269-95).
[246] See Jean-Claude Milner, *L'amour de la langue*, Paris: Verdier [1978] 2009, pp. 78-89.

contribution lies in its capacity to reinforce, or even to nuance or clarify the principles of synchronic linguistics laid out in the *Cours.* For as readers of that text will recall, it introduces a synchronic approach to linguistic study not in order to replace a diachronic perspective, but rather to complement it: "Les deux parties de la linquistique, ainsi délimitées, feront successivement l'objet de notre étude," we read in the closing lines of the introductory "Principes généraux":

> La *linguistique synchronique* s'occupera des rapports logiques et psychologiques reliant des termes coexistants et formant système, tels qu'ils sont aperçus par la même conscience collective.
>
> La *linguistique diachronique* étudiera au contraire les rapports reliant des termes successifs non aperçus par une même conscience collective, et qui se substituent les uns aux autres sans former système entre eux.[247]

Neither an exclusively synchronic nor an exclusively diachronic perspective is sufficient to elucidate a given language, let alone language writ large; the linguist is "amené par la force des choses à la considérér tour à tour statiquement [synchroniquement] et historiquement [diachroniquement]." The crucial methodological point is this:

> il ne faut pas oublier qu'en théorie cette unité [d'une langue donnée à un moment donnée] est superficielle, tandis que la disparité des idiomes cache une unité profonde. Que dans l'étude d'une langue l'observation se porte d'un côté ou de l'autre, il faut à tout prix situer chaque fait dans sa sphère et ne pas confondre les méthodes.[248]

Synchronic analysis may well yield great insights into the "profound unity" of languages, but only if its practitioners remain constantly aware that their object of study—a given language at a given moment in time—is but a "superficial unity." Anyone who seeks to speak with authority

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[247] *Cours de linguistique générale*, Paris: Payot, 1962, p. 140 (henceforth *CLG*). For the sake of simplicity, I will be quoting from this edition for all points securely attested in Rudolf Engler's critical edition (Wiesbaden: Harrassowitz, 1967-74); citations drawn from other editions will be explicitly noted as such.
[248] *CLG*, p. 140.

on language generally must understand the procedures of both synchronic and diachronic linguistics, and also be able to distinguish observations susceptible to synchronic analysis from those susceptible to diachronic study.

In the pages that follow, I demonstrate that Saussure's observations on vowel colors may be profitably considered from the perspective of diachronic linguistics, a perspective from which it is possible to see their striking relationship to the *teintes*, or timbres, of vowel sounds.[249] The text proceeds in four parts. Part one reviews the three existing scholarly attempts to reconcile the vowel-color text with the principles of synchronic linguistics advanced in the *Cours*. Part two proceeds to a close reading of the vowel-color text itself, finding that the color sensations Saussure reports are prompted by something other than a differential phoneme, the minimal unit of analysis in synchronic linguistics. Part three demonstrates that the colors' prompt must be phonetic, rather than phonological in nature, and that the colors might be best elucidated from a diachronic perspective. Finally, part four draws out the affinity between those colors, explicitly equated with the colors of objects seen in the world, and the vocalic "colors" (*couleurs*) and "hues" (*teintes*) that Saussure traces through the vowel systems of the Indo-European languages in his ground-breaking *Mémoire sur le système primitif des voyelles dans les langues indo-européennes* of 1879.

[249] In Saussure's usage, the term *teinte* usually designates "timbre"; however, Saussure also uses the term *teinte* in its visual sense, to designate "hue." The same is true of the term *couleur* and its variants (colorer, coloration, décoloration, etc.).

I. Colored vowels and the Cours

The three extended commentaries that have been devoted to the vowel-color text, by the Swiss literary scholar Johannes Fehr (1997), Italian philosopher Marco Mazzeo (2004), and Scottish linguist John E. Joseph (2012),[250] furnish three distinct attempts at reconciling Saussure's color sensations with the model of synchronic linguistics advanced in the *Cours de linguistique générale*. In his 1997 monograph *Saussure : Entre linguistique et sémiologie,* Johannes Fehr contends that the vowel colors, purely subjective and particular to Saussure, may be accommodated within a slightly broadened understanding of the associative axis fundamental to Saussure's model of synchronic analysis.[251] As readers of the *Cours* will recall, the text's establishment of the linguistic sign as the fundamental unit of analysis for synchronic linguistics is followed by a discussion of that unit's behavior in terms of two axes: the syntagmatic axis and the associative (or paradigmatic) axis. The syntagmatic axis describes the "sphere of mental activity" by which a speaking subject combines words into meaningful sequences, the "associative axis," that by which the subject selects each word in the sequence from a cluster of associated words. While the rules governing syntagmatic relations are "purement immanents à la

[250] Johannes Fehr, "Les couleurs des voyelles," *Saussure : Entre linguistique et sémiologie*, trans. Pierre Caussat, Paris : P.U.F., [1997] 2000, pp. 146-79 (and particularly 160-71); John E. Joseph, "Coloured Hearing," in *Saussure*, pp. 392-7. A slightly different version of Joseph's text appeared in the Nov. 6, 2007 issue of the *Times Literary Supplement* ("He was an Englishman," pp. 14-5). Saussure's colored vowel text is also noted, though not extensively analyzed, in Herman Parret's "Métaphysique saussurienne de la voix et de l'oreille dans les manuscrits de Genève et de Harvard," *Ferdinand de Saussure*, Paris: L'Herne, 2003, pp. 62-78; Mazzeo's *Storia naturale sinestesia : Dalla questione Molyneux a Jakobson*, Rome: Quodlibet, 2005, pp. 87-9; and Joshua T. Katz's "Saussure's *anaphonie* : Sounds Asunder," *Synaesthesia and the Ancient Senses*, ed. Shane Butler and Alex Purves, Durham: Acumen, 2013, pp. 167-84.

[251] The associative axis, more familiar to modern readers as the "paradigmatic axis," thanks to Louis Hjelmslev and Roman Jakobson, is outlined in "Rapports syntagmatiques et rapports associatifs," *CLG*, pp. 170-5.

langue"[252] and therefore identical for all speakers of a given language, associative relations will vary in accordance with the personal experience of the language user: "elles font partie de ce trésor intérieur qui constitue la langue chez chaque individu."[253] Fehr's suggestion is that just as any given word "fera surgir *inconsciemment dans l'esprit* une foule d'autre mots"[254] along the associative axis whose contents depend on the personal experience of the subject, so will any given vowel give rise to a host of associations that will differ in accordance with that subject's personal experience.[255] Transposing the associative axis from the level of the word to the level of the vowel, Fehr is able to maintain the integrity of the linguistic model proposed in the *Cours*, even—he argues—achieving greater insight into the applicability of its precepts.

The elegance of Fehr's argument belies a number of dubious transpositions, for the *Cours* articulates the associative axis exclusively with reference to the linguistic unity of "the word." "[L]es mots offrant quelque chose de commun," we read, "s'associent dans la mémoire, et il se forme ainsi des groupes au sein desquels règnent des rapports très divers […] Nous les appellerons *rapports associatifs.*"[256] A first question to address in considering potential "associative relations" on the level of phonology would be the "something common" (*quelque chose de commun*) by means of which phonemes might come to be associated. In the case of words, this "something common" is explicitly identified as "la seule analogie des signifiés (*enseignement*, *instruction*, *apprentissage*, *éducation*, etc.), ou […] la simple communauté des images acoustiques (par exemple enseigne*ment* et juste*ment*)."[257] The common element that

[252] Fehr, p. 152.
[253] *CLG*, p. 171.
[254] *CLG*, p. 171, cit. Fehr, p. 152 (emphasis Fehr's).
[255] Thus, in Fehr's account, other speakers might well possess color-vowel conjunctions just as Saussure does, but these "colorations" would be "différente[s] de sujet à sujet" (164).
[256] *CLG*, p. 171.
[257] *CLG*, p. 174.

would create associative relations between vowels, however, goes unspecified in Fehr's account. Furthermore, the search for the common element reveals an additional structural complication inherent in Fehr's transposition. For the "associative relation" he describes conjoins elements unlike in kind—vowels to colors—by means of an unstated "quelque chose de commun," whereas the "associative relation" of the *Cours* describes associative relations between elements alike in kind—words—by means of analogy between these words' signifieds or, alternatively, similarity between their signifiers. One final slippage in Fehr's analysis should also be noted. Where Saussure refers to color "sensations," Fehr offers an account of vowel-color "associations." Saussure uses the term "association" in analyzing his color sensations, to be sure, but these "associations" remain appreciably distinct from the "sensations" themselves, which are consistently referred to as "sensations."[258] While the term "sensation" indicates a physical response concerning the senses, an "association" need not implicate the senses at all; in Fehr's assimilation of "sensation" into a rubric of "association," the question of sensory perception is entirely effaced.[259]

Rather than assimilate the vowel colors into the model of synchronic analysis advanced in *Cours*, Saussure's biographer John E. Joseph casts the colors out of the field of linguistics

[258] For example: Saussure explains that it is not the vowel as such "qui appelle une certaine sensation visuelle correspondante. D'un autre côté, ce n'est pas non plus la vue d'une certaine lettre ou d'un certain groupe de lettres qui appelle cette *sensation*. Mais c'est la voyelle en tant que contenue dans cette expression graphique, c'est l'être imaginaire que forme cette première association d'idées, qui, par une autre association, m'apparaît comme doué d'une certaine *consistance* et d'une certain *couleur*, quelquefois aussi d'une certaine *forme* et d'une certaine *odeur*." (Saussure cit. Flournoy, *Phénomènes*, p. 50; italics Flournoy's).

[259] As another of the text's commentators, Marco Mazzeo, points out, "la décision par laquelle le linguiste s'exprime dans ses réponses au questionnaire, fait pencher vers l'hypothèse que Saussure n'est pas en train de se référer à des associations ponctuelles, mais à l'expérience éclatante suscitée par les voyelles" (Mazzeo, p. 134). Mazzeo's comment is intended to dispel any doubts about the consistency of Saussure's color sensations over time (his rejection primarily concerns *ponctuelles*). But his characterization of Saussure's color sensations as "l'expérience éclatante suscitée par les voyelles"—as opposed to "associations"—is acute.

entirely. Implicitly rejecting Fehr's analysis, to which he makes no reference, Joseph suggests, non-committally, that the colors might derive from the visual qualities of objects in the world. If, for example, Saussure finds *-ain* to be "pale yellow, like an incompletely baked brick," this is probably because bread—in Saussure's native French, *pain*—"is also a sort of pale yellow when incompletely baked."[260] Identifying color as a quality proper to an object in the world, Joseph traces its migration—by means of the linguistic sign conjoining the concept under which it falls (bread, the signified) with a string of speech sounds (*pain*, the signifier)—to a detachable part of the sound sequence constitutive of this signifier (*-ain*). While the referent, incompletely baked bread, is pale yellow, the series of associations by which its pale yellow hue comes to attach to "*-ain*" is entirely contingent. Another speaking subject, even a Francophone one, might just as easily come to associate the earthy brown of a given *terrain*, for example, with the vowel sound *-ain*. Thus, even if Saussure's color associations can be traced through a series of logical steps, they remain subject-specific. No necessary link conjoins "pale yellow" with "*-ain*"; the conjunction is not inherent, but idiosyncratic. This idiosyncrasy is crucial to Joseph's reading, as it is the subject-specificity of Saussure's color-vowel conjunctions that permits his biographer to dismiss them as irrelevant to the study of language. "At no time does [Saussure] make the

[260] Joseph, *Saussure,* p. 394. Joseph's suggestion that the vowel colors ultimately derive from the referential world is not implausible, but it is far from conclusive. Joseph offers referential sources for the colors of only three vowels (*-ain/pain*, *-ein/veine*, *-in/in-*); of the numerous other vowel-color correspondences Saussure reports (-[i]*en*, *a*, *u*, *ou*, *i*, and *é*), Joseph offers no account. One might also observe that to accept this explanation is to attribute an uncharacteristic lack of acuity to Ferdinand de Saussure. For if his color perceptions were so easily explicable, it seems likely that Saussure himself would have reached this conclusion in the space of his response. Put another way, to dismiss the vowel colors as associations to related words' referents seems to be to take the object of study less seriously than Saussure did himself.

slightest suggestion that anyone else shares his way of seeing," Joseph concludes, decisively; "That being so, language—a social fact—is not implicated."[261]

While it is certainly true that Saussure never makes "the slightest suggestion that anyone else shares his way of seeing," it is not clear that this reticence should be taken as license to foreclose all inquiry into the vowel colors' potential relevance to linguistics. To begin with, one might observe that Saussure refrains from all speculation, be it positive or negative, concerning the generalizability of the sensations he reports. Responding to a question articulated in the second person ("Quelle couleur trouvez-vous aux voyelles a, é, i, o, u, ou ?"[262]), Saussure responds, naturally enough, in the first ("Je la vois jaune pâle," etc.). Although he employs a

[261] Joseph, *Saussure*, p. 397. Joseph's account, the only one available in English to date, contains a couple of questionable assertions. It states that "just one of [Flournoy's] 700 anonymous subjects reported that it made a difference to him how a sound was written" (393) and that for this reason, Flournoy "excluded it from the quantitative analysis performed on the other 700 responses" (394). Flournoy does not indicate that he excluded Saussure's account from his quantitative analysis, and in analyzing Saussure's response, he writes, "On peut dire que cette complexité de l'inducteur est la règle ; même lorsque le photisme est consciemment attribué au seul son, on découvre souvent que l'orthographe n'est pas sans influence, de sorte que, chez un même individu, la couleur d'un son change de teinte suivant qu'il se le représente écrit d'une façon ou d'une autre, ou qu'il n'en évoque aucune traduction écrite" (Flournoy, *Phénomènes*, pp. 52-3). Saussure's account was not exceptional in noting the influence of writing; on the contrary, at least in the data sample available to Flournoy, it was in keeping with "the rule." Second, Joseph asserts that "[s]tudies from this period do not mention Rimbaud, who with his fellow *poètes maudits* lay beyond the pale of polite academic discussion" (394). Today's scholarly will to distance all serious thinkers from the figure of Arthur Rimbaud could furnish material for a book unto itself, but for the purposes of this chapter, it will suffice point out that Flournoy refers to Rimbaud's sonnet in the *Phénomènes* twenty-two pages after the quotation from Saussure (Flournoy, *Phénomènes*, p. 74).

[262] I quote the questionnaire as reproduced by Flournoy in the appendix of the *Phénomènes de synopsie* (p. 256), as it corresponds very closely with Saussure's response. In her 1983 "Présentation," Mireille Cifali refers to a facsimile copy of the questionnaire held in the *Archives de la Faculté de psychologie et des sciences de l'education*; presumably this text provides the basis for her suggestion that "La question exacte est formulée en ces termes: « Quelles couleurs trouvez-vous aux voyelles ? »" (Cifali, "Réponse," p. 127fn). I cite the Flournoy over the facsimile because Saussure specifically addresses the vowels enumerated in the question as it appears in Flournoy's appendix with only two exceptions (he addresses /ɛ̃/ to explain the imprecision of the question, then skips *o*, for reasons less readily apparent).

number of impersonal constructions ("[une voyelle] appelle une certaine sensation visuelle correspondante"), these constructions are unambiguously intended to be understood with reference to the writer; with few exceptions, such constructions appear in pronominal forms ("elle me rappelle," "elle me fait l'effet") or in the company of prepositional phrases that limit their range of reference ("pour moi," "dans mon esprit," etc.).[263] Saussure thus maintains himself within the limits of his own experience, leaving to Flournoy the considerable task of relating that experience to the experiences of others. But it is important to note the distinction between Saussure's "for me" from Joseph's presentation of that "for me" as the assertion "*only* for me." The second phrase asserts knowledge about the condition of others; in claiming unique status for the speaker, it necessarily imputes a different status to everyone else. Saussure's constructions, however, carry no such implication. To qualify a statement with the phrase "for me" is simply to acknowledge the limits of one's experience, and to refrain from commentary on what one does not know. To say "for me" is not to say "for all," certainly; but neither is it to say "only for me." To construe Saussure's absence of commentary on the generalizability of his sensations as an authoritative position on a topic he does not appear ever to have studied, therefore, seems unjustified.

A careful reader might well wonder why Joseph should be so eager—even, perhaps, a bit hasty—to establish the vowel-color text's irrelevance to linguistics. Such a reader need look no further that Marco Mazzeo's 2004 commentary, which identifies the unstated adversary lurking behind Joseph's analysis. "Au delà du détail biographique," Mazzeo contends, "le témoignage de Saussure est intéressant parce qu'il nous ramène à une question théorique du plus grand relief, celle du phono-symbolisme." The question the vowel-color text forces its readers to confront,

[263] Flournoy, *Phénomènes*, pp. 50-2.

Mazzeo argues, may be simply stated: "Existent-ils des limites à l'arbitraire de la langue ? Si oui, en quoi consistent-elles ?"[264] Citing Tullio De Mauro's contention that within the framework established by the *Cours*, "[p]ostuler […] une rigide correspondance entre un son et sa valeur symbolique présupposée est impossible, et plus encore ridicule," Mazzeo points out that the vowel color text would seem to do just that: to propose a rigid correspondence between "a sound" (a vowel) and a "symbolic value" (a color).[265] While both Fehr and Joseph assume this correspondence to be subject-specific (and, therefore, not to imply a "rigid correspondence" between vowels and colors generally), Mazzeo points to a significant body of research suggestive of "un symbolisme phonique universel ou quasi-universel," even going so far as to place Saussure's vowel-color correspondences within a table that comprises empirical data on vowel-color synesthesia.[266]

Mazzeo readily acknowledges that to contend that a particular sound always corresponds to a particular idea is to invite a host of counterexamples drawn from innumerable languages. But he continues on to specify that "[c]ela ne signifie pas, toutefois, qu'il n'est pas possible de reconnaître des lignes de tendance indiquant certains liens privilégiés entre la structure des signifiants et le champ des signifiés dans le langage."[267] The specificity of the Italian philosopher's phrasing merits close consideration. It is not "preferential ties between signifiers and signifieds" that Mazzeo suggests might be discerned. Such a proposal would amount to nothing less than a direct assault on the arbitrary sign foundational to the *Cours de linguistique*

[264] Mazzeo, p. 136.
[265] Mazzeo, p. 136. The note to which he refers is note 142 in the French translation of Tullio de Mauro's critical edition of the *CLG* (pp. 446-7), which relates to Saussure's discussion of onomatopoeia.
[266] Mazzeo, pp. 137, 141.
[267] Mazzeo, p. 136.

générale.[268] It is, rather, "preferential ties between the structure of the signifiers and the field of signifieds" that Mazzeo proposes might be revealed. "The structure of signifiers" refers to the components of which signifiers are composed (of which vowels are cited as an example), and, perhaps, their arrangement; "the field of signifieds" refers to the semantic field composed of concepts defined by their realization in linguistic signs (in Mazzeo's account, colors are examples of "signifieds"). Thus, for Mazzeo, the vowel-color text presents an opportunity for a sharper understanding of the relationship between the field of signifieds and the structure of signifiers: between the field of concepts and the meaningless speech sounds constitutive of the signifiers that variously divide that field.

Mazzeo's ambition to discern what contribution Saussure's vowel-color text might make to the study of synesthesia is an admirable one. But the realization of such an ambition would be conceivable only in the presence of two elements absent from his study. The first is a clear understanding of the structure of Saussure's vowel-color sensations. As the nature of the stimulus prompting Saussure's color sensations would be decisive in determining how his account might be put into meaningful relation with existing scientific data, a first question to consider would be the status of the "vowels" themselves, as phonemes, graphemes, or the material components constitutive of their realizations as either (i.e., as acoustic sounds, angles, lines, etc.). The second element Mazzeo's approach would require would be an existing data set composed of accounts attesting to exactly the same vowel-color sensations Saussure reports.

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[268] "Nature du signe linguistique," *CLG*, pp. 97-103, and esp. "§ 2. Premier principe : l'arbitraire du signe," pp. 100-2. As is well known, the characterization of words' relationship to what they designate as "arbitrary" was commonplace in Saussure's day, and indeed well before (see, for example, André Chevrel, "Le débat sur l'arbitraire du signe au XIXe siècle," *Romantisme* 25-6 (1979), pp. 3-33). The novelty of the arbitrary sign of the *Cours* is not the arbitrary nature of the relationship it decares between concept and acoustic image (*signifié* and *signifiant*) but rather the distinction of the concept (*signifié*) from the thing in the world (the referent). On this point, see Jean-Claude Milner, "Saussure," *Le périple structural*, Paris: Verdier, 2008, pp. 15-57.

Clearly, the acquisition of element one (knowledge of the stimulus in Saussure's case) must precede any determination concerning element two (the data set to which that case might be related). For even if such a data set should happen to exist, it would be recognizable only to the scholar possessed of element one. A fourth reading of the text, therefore, might do well to begin with a simple question: what prompts the color sensations Saussure reports?

II. "L'être $\begin{bmatrix} \textit{voyelle} & \text{x} \\ \textit{lettre} & x \end{bmatrix}$ *est caracterisé par tel aspect, telle teinte, tel toucher."*[269]

That the answer to the question of what prompts Saussure's color sensations is not straightforward is attested by the length at which Saussure himself reflects on it. In response to the query,

> *Quelle couleur trouvez-vous aux voyelles a, é, i, o, u, ou ? — Indiquer autant que possible la nuance (rouge, blanc, etc.) et le degré de clarté (brillant, clair, foncé, etc.)*,[270]

Saussure replies:

> Je ne crois pas pouvoir répondre à la question (sur la couleur des voyelles) dans les termes où elle est posée. Car voici la circonstance qui me frappe : Nous écrivons en français la même voyelle de quatre manières différentes dans terr*ain,* pl*ein,* mat*in,* chi*en*. Or quand cette voyelle est écrite *ain*, je la vois jaune pâle comme une brique mal cuite au four ; quand elle est écrite *ein*, elle me fait l'effet d'un réseau de veines violacées ; quand elle est écrite *in*, je ne sais plus du tout quelle sensation de couleur elle évoque dans mon esprit et suis disposé à croire qu'elle n'en évoque aucune ; enfin, si elle s'écrit *en* (ce qui n'arrive qu'après un *i* précédent), l'ensemble du groupe *ien* me rappelle assez un enchevêtrement de cordes de chanvre encore fraîches, n'ayant pas encore pris la teinte blanchâtre de la corde usée.
>
> Ce n'est donc pas, semble-t-il, la voyelle comme telle, c'est-à-dire telle qu'elle existe pour l'oreille, qui appelle une certaine sensation visuelle correspondante. D'un autre côté, ce n'est pas non plus la vue d'une certaine lettre ou d'un certain groupe de lettres qui appelle cette sensation. Mais c'est la voyelle en tant que contenue dans cette expression graphique, c'est l'être imaginaire que forme cette première association d'idées, qui, par une autre association, m'apparaît comme doué d'une certaine *consistance* et d'une certaine *couleur,* quelquefois aussi d'une certaine *forme* et d'une certaine *odeur* […][271]

Saussure begins by observing that the term "vowel" does not accurately name that which "calls up a certain corresponding visual sensation." As is made explicit in his brief gloss "the vowel as such, which is to say, such as it exists for the ear," he understands the term "vowel" to refer to an

[269] Saussure cit. Flournoy, *Phénomènes*, p. 51.
[270] Flournoy, *Phénomènes*, p. 256.
[271] Flournoy, *Phénomènes*, p. 50.

exclusively aural phenomenon. A single vowel, thus defined—here, the French nasal /ɛ̃/[272]—is found to evoke "pale yellow," "purplish veins," "still-fresh hemp ropes," and "no color at all," depending on how it is spelled, leading Saussure to conclude that the "vowel as such" is not the exact stimulus, or at least not all of it. He then suggests that this stimulus might more accurately be described as "a vowel as it is contained in [its] graphic expression." The vowel, it bears noting, does not appear to require phonation in order to produce its effects; it need only be conceived in the mind of the reader confronted with its written form. "Ces attributs de couleur," Saussure goes on to observe, "ne s'attachent pas, autrement dit, à des valeurs acoustiques, mais à des valeurs orthographiques, dont je fais involontairement des substances. L'être $\begin{bmatrix}\text{vowel} & x \\ \text{letter} & \text{x}\end{bmatrix}$ est caracterisé par tel aspect, telle teinte, tel toucher."[273] The name "colored hearing" (*audition colorée*),[274] then, would appear to be imprecise. The activity in question is not hearing, but reading.[275]

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[272] In my discussion, I will use the symbol // to designate phonemes, [] linguistic sounds that may or may not precisely match the aural contours of the phonemes of a given language, and <> to designate graphemes. Saussure's account as it appears in Flournoy's text uses none of these symbols, however; letters are italicized for emphasis, but this emphasis alternately signals their graphic and phonic status. Nonetheless, I reproduce quotations from Saussure's account precisely as rendered by Flournoy.

[273] Flournoy, *Phénomènes*, pp. 50-1.

[274] Cifali's title for the excerpt in *Le Bloc-Notes de la psychanalyse* 3 (1983) is "Réponse à une enquête sur l'audition colorée" (p. 137); Joseph's chapter title, "Coloured Hearing," follows suit (*Saussure*, pp. 392-7). The application of the term to Saussure's text is entirely understandable—Flournoy himself felt compelled to add the parenthetical note "audition colorée" beneath the title *Phénomènes de synopsie* on the inside cover page—but it is also misleading. In his introductory remarks, Flournoy explains that "le terme reçu d'*audition colorée* est trop large, si on le prend dans son acceptation la plus vaste, selon laquelle il a parfois été appliqué à des liaisons où la vue ne joue aucun role; et trop étroit si on le restreint à son sens propre, qui ne convient qu'aux impressions de couleurs suscitées par l'ouïe" (*Phénomènes*, p. 5). Flournoy himself would certainly not have classified Saussure's response as a case of "colored hearing"—and with good reason.

[275] This would explain, at least in part, the difficulty Marco Mazzeo encounters in his attempt to reconcile Saussure's color sensations with various data sets furnished by scientific surveys (see "Tableau 1" in Mazzeo 2004, p. 141). Mazzeo collapses many different kinds of vowel stimuli

Reading is not reducible to seeing, of course, and as Saussure takes care to note, whatever prompts the sensations of color cannot be explained merely with reference to sight. It is not "seeing a certain letter or group of letters that calls forth this sensation; rather, it is the vowel as it is contained in this graphic expression," he explains; "it is the imaginary being formed by this first association of ideas which, through another association, appears to me as endowed with a certain *consistency* and a certain *color* […]." As a preliminary schema, then, we might sketch out something like

$$\text{letter(s)} + \text{vowel} \rightarrow \text{imaginary being} \rightarrow \text{color.}$$

As Saussure's phrasing does not exactly add "graphic expression" to "vowel," however, but rather cites the vowel specifically as it inheres in a particular transcription, a more precise expression might be

$$\begin{bmatrix} \text{vowel} & x \\ \text{letter} & \text{x} \end{bmatrix} \rightarrow \text{imaginary being} \rightarrow \text{color,}$$

with the expression $\begin{bmatrix} \text{vowel} & x \\ \text{letter} & \text{x} \end{bmatrix}$, which would appear to be Saussure's own[276], reflecting the unequal relationship between the letters and the unspoken "vowel" to which they give rise. For while Saussure reflects that the spelling of the vowel affects the color sensation that it evokes, it

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(spoken vowels that prompt color sensations, graphemes that prompt color sensations, and Saussure's "imaginary beings," to name just a few) in his chart, which—unsurprisingly—reveals no striking commonalities among the correspondences it collates.

[276] Flournoy's introductory remarks establish that the survey was distributed in paper form, and the many hand-drawn diagrams reproduced in the 1893 edition attest to the handwritten nature of many if not all of the responses. As one of these drawings can be securely attributed to Ferdinand de Saussure, it seems very probable that his response was submitted as a handwritten document, but the document itself is now lost (for the drawing, see Flournoy, *Phénomènes*, p. 164; for its attribution and an account of the search for Saussure's missing "Réponse" itself, see Cifali, "Présentation," pp. 133-5, as well as her note on p. 139 of the excerpt's re-publication). Flournoy's edition presents the passage on vowel colors in standard type (with occasional italics and one blackletter **𝔲**) and typographically rendered, rather than hand-drawn, matrices for the imaginary beings. It is thus difficult to determine the degree to which the rendering we have replicates Saussure's own expression.

is clear that orthography is of interest only insofar as it affects the color of the vowel. One could not say—to clarify by counterexample—that the vowel is of interest only to the extent that it suggests a spelling.

One lingering imprecision in the second model invites an additional correction. While the diagrams proposed progress in accordance with the successive structure of Saussure's prose, the parallel construction of the phrases "c'est la voyelle en tant que contenue dans cette expression graphique, c'est l'être imaginaire que forme cette première association d'idées," suggests a relationship of parallelism more than one of progression. In this reading, the vowel that inheres in a transcription does not "give rise" to the imaginary being. It *is* the imaginary being:

$$\begin{bmatrix}\text{vowel} & x\\ \text{letter} & \text{x}\end{bmatrix} = \text{imaginary being} \rightarrow \text{color.}$$

Finally, in order to reflect Saussure's closing remark that "[s]eules les voyelles des mots ont pour moi des couleurs assez définies,"[277] we might insert an indication that the imaginary being requires not just a letter (or letters), and "a vowel" but, more specifically, a vowel "in a word"—which is to say, in a particular langage:[278]

$$[\text{a language } [\text{a word } \begin{bmatrix}\text{vowel} & x\\ \text{letter} & \text{x}\end{bmatrix}]] = \text{imaginary being} \rightarrow \text{color.}$$

[277] Flournoy, *Phénomènes*, p. 52.

[278] As the graphic expressions of vowels differ dramatically from language to language, it is clear that the combination of $\begin{bmatrix}\text{vowel} & x\\ \text{letter} & \text{x}\end{bmatrix}$ is, generally speaking, always going to be embedded in a particular tongue. *Pain*, for example, would give one imaginary being for French [ɛ̃/-ain], quite another for English [eɪ/-ai-]. Interestingly, when Saussure considers the vowels "*ou*" and "*u*," whose phonation in French corresponds to the German vowels marked <u> and <ü>, he replaces the "voyelle x" slot in the matrix with the expression "voyelle déterminée" in the first case and with "son ü" in the second. Thus, he ends up with equations such as "*u*, c'est-à-dire $\begin{bmatrix}\text{son} & \text{ü}\\ \text{lettre} & \text{u}\end{bmatrix}$ est acier bleu sombre," illustrating that even if a "sound" exists in two languages, it has to be placed in the context of one or the other by means of its graphic rendering in order to prompt a particular color (Ibid.).

One might well pause to wonder just what sort of "vowel" lurks within that term as it appears in Saussure's text at this juncture. Neither an audible sound nor a graphic expression, this "vowel" would appear to be, like the well-known *signifiant* or *image acoustique* of the *Cours*, "pas le son matériel, chose purement physique, mais l'empreinte psychique de ce son, la représentation que nous en donne le témoignage de nos sens."[279] This vowel would be a memory, a recollection, an aggregate of an oft-repeated sound associated over time with a particular "graphic expression." But the psychological imprint, in the Saussurean model, differs from the sound itself in one crucial respect. The psychological imprint retains the memory of a signifying sound only, which is to say, the sound only insofar as it is decisive in meaning. While a sound that is realized coincides, necessarily, with a material form, and may therefore be said to bear particular properties inherent to that material, the psychological imprint is bereft of qualitites. The *Cours* articulates this principle in no uncertain terms. The linguistic signifier, we read, "n'est aucunement phonique, il est incorporel, constitué, non par sa substance matérielle, mais uniquement par les différences qui séparent son image acoustique de toutes les autres." And what is true for the *signifiant* holds for "all the material elements of language, including phonemes":

> Ce principe est si essentiel qu'il s'applique à tous les éléments matériels de la langue, y compris les phonèmes. [… C]e qui les caractérise, ce n'est pas, comme on pourrait le croire, leur qualité propre et positive, mais simplement le fait qu'ils ne se confondent pas entre eux. Les phonèmes sont avant tout des entités oppositives, relatives, et négatives.[280]

But if the "vowel" of the expression $\begin{bmatrix}\text{vowel} & x \\ \text{letter} & \text{x}\end{bmatrix}$ is the differential phoneme that it would appear to be, how can it be "characterized by a certain aspect, hue, and feel" (*caracterisé par tel aspect, telle teinte, tel toucher*)? Two possibilities present themselves. The positive qualities could be attached exclusively to the "orthographic values" associated with the "vowel" noted in

[279] *CLG*, p. 98.
[280] *CLG*, p. 164.

the upper portion of the expression and bear no relationship to that vowel at all. As Saussure states that merely "seeing a certain letter or group of letters" does not suffice to prompt the colored sensations, however, this first possibility must be cast out. It is only when the letters are associated with a vowel that "a certain corresponding visual sensation" is "called up." The conception of a "vowel" distinct from its graphic expression is requisite to the prompting of the color sensation, even if the phonation of that vowel is not.

The second possibility would be that the properties somehow come to inhere in the vowel itself as it takes shape in the mind of the reader. In the passage from "group of letters" to "vowel," or perhaps the passage from "vowel" to vowel in a word in a particular language, it would have to become something other than a vowel: something immaterial and incorporeal, yet also possessed of "its own positive properties." This, it seems, is what compels Saussure to refer to the prompt for his color sensations not as a "vowel" but as an "imaginary being."

The imaginary being, then, would seem to be less the differential phoneme of synchronic linguistics than the *lĭttera* of Ancient Rome. The minimal unit of language, the Roman *lĭttera* was said to possess three aspects, or realizations: *figura*, the written form; *potestas*, the spoken form; and *nomen*, the name by which it may be designated in teaching.[281] *L'être imaginaire* Saussure describes is very much the ancient *lĭttera*—an abstraction that, in his native French, one might well call a *lettre imaginaire*.

[281] David Abercrombie, "What is a 'letter'?" *Lingua* 2 (1949), pp. 58-9.

III. "Ce qui fixe la prononciation d'un mot, ce n'est pas son orthographe, c'est son histoire." [282]

The imaginary being that prompts a color sensation differs appreciably from the "vowel as such," be it the differential phoneme or its acoustic realization. Saussure initially identifies this difference with orthography, noting that the single French phoneme /ɛ̃/ prompts four different visual responses in him, in accordance with that phoneme's written form in the context of different words (*terrain*, *plein*, *matin*, *chien*). He later notes that if a single word is written out phonetically, rather than in accorance with its conventional spelling, his color impression changes again. "Un *a* qui n'est pas écrit *a,* par exemple l'*a* de *roi*," he reflects, "n'évoque pas ces idées [of yellowish white, yellowed paper, eggshells]—à moins que je n'écrive le même mot phonétiquement *rwa.*"[283] Here, the color sensation would seem to follow the letter *a*, rather than the phoneme /a/: the thought of *roi*, despite its /a/, does not prompt the colors, unless it is imagined in its phonetic transcription, <rwa>. The fact that "rwa" is not a word that exists in written French does not appear to be a problem.

Finally, Saussure suggests that in addition to orthography, typography might play some role in his color sensations as well. The French vowel *ou* (/u/) is "a beautiful, gray velvet, or a very soft, gray drape, very faded in tone," but when the same vowel, "en allemand par exemple, s'écrit **u**, la sensation est foncièrement la même, mais incomparablement moins forte."[284] As the vowel at issue here crosses three distinct boundaries—of orthography (<ou> → <u>), typeface (Roman to Blackletter), and idiom (French to German)—it is difficult to say with certainty which

[282] *CLG*, p. 53.
[283] Flournoy, *Phénomènes*, p. 51.
[284] Flournoy, *Phénomènes*, p. 52.

of these variables, or which combination thereof, is decisive.[285] What is clear, in any case, is that the isolated vowel sound alone is insufficient to explain the colored sensations associated with it.

On the basis of this evidence, it would certainly be tempting to conclude that it is the sight of a graphic letter that provides the stimulus for the color, for there is no discrepancy noted in the text that cannot be tied to a written character. And yet, Saussure's explicit consideration, and rejection, of this conclusion casts serious doubt on its validity. His statement is unambiguous: "it is not the sight of a certain letter or of a certain group of letters that calls up this sensation."

Let us go back to the drawing board. If we take a slightly closer look at the four "imaginary beings" with which Saussure begins—[ɛ̃/-*ain*], [ɛ̃/-*ein*], [ɛ̃/-*in*], and [ɛ̃/-*ien*]—we might note, as indeed Saussure himself does, that one of these is not quite like the others:

> … si elle s'écrit *en* (ce qui n'arrive qu'après un *i* précédent), l'ensemble du groupe *ien* me rappelle assez un enchevêtrement de cordes de chanvre encore fraîches, n'ayant pas encore pris la teinte blanchâtre de la corde usée.[286]

In the case of the /ɛ̃/ of 'chien,' the visual sensation of "a tangle of hemp ropes" is called up by the group of letters <ien>, which is to say, a different group of letters from the ones Saussure knows to be the transcription of the vowel (<en>). The color of the imaginary being thus appears to be based not just on the orthography of the "vowel" but also on the orthographic environment that surrounds it—or, perhaps, on the phonological or morphological environment that that orthography was devised to reflect. The exceptional inclusion of the letter *i* within the imaginary

[285] The type of visual alteration Saussure describes here—the color remains "fundamentally the same" but seems "incomparably less strong"—does correspond to the dimunition of intensity he identifies with vowel sounds' passage out of French and into other languages. "Je n'ai guère observé si dans les langues étrangères la série des correspondances est pour moi la même qu'en français," he mentions in passing; "Il me semble en tout cas qu'elle y est moins intense, moins développée, moins précise" (Flournoy, *Phénomènes*, p. 51).
[286] Flournoy, *Phénomènes*, p. 50.

being would seem to correspond not to a graphic specificity of the word *chien,* but rather to a phonological specificity: what makes the *i* of *chien* categorically different from the *l* of *plein* or the *r* of *terrain* or the *t* of *matin* is not its visual shape, but its phonological necessity. Without it, the <en> that follows is not /ɛ̃/, but /ɑ̃/, as in "*en français*." What makes the <en> of *chien* fall into rhyme with *terrain*, *matin*, and *plein* is not the grapheme <i>, but the phonological form of the speech sounds transcribed in Modern French as "-*ien*." The <i> is merely a signal for the semi-vowel /j/, which the reader subconsciously understands to indicate that the vowel to come bears a different timbre than one expects. Saussure's anomalous inclusion of the letter *i*, in short, seems to be less the inclusion of a letter *per se* than the inclusion of a phonological specificity signaled by a letter. The *i* is not the letter <i>, but the semi-vowel /j/ that it transcribes, which acts as a sort of timbral coefficient, signaling the exceptional quality of the vowel to come. Although the semi-vowel is appreciably distinct from "the vowel as such," it is decisive in determining that vowel's timbre as well as, it would seem, its color.

The implications of this proposition are not trivial. For if we concede that, despite appearances, the *i* of the imaginary being [ɛ̃/-*ien*] is not in fact a letter but a phonological element, we are obliged to ask if all the letters of all the imaginary beings might not be phonological elements as well. Might the groups of letters <in>,<ain>, and <ein> also signal phonological structures in excess of what may be articulated by the isolated phoneme, "the vowel as such"?

The skeptical reader may well ask: what sort of "phonological structures" would these be? After all, by Saussure's own account, "-ain," "-in," "-ein," and "-[i]en" are all "*la même voyelle*." And from the perspective of phonology, the fact is indisputable: regardless of any variations in pronunciation, <ain>, <in>, <ein>, and <[i]en> all correspond to a single phoneme

of modern French, defined by its capacity to be opposed to all the other phonemes of the language. Any difference in the aural contours of these vowels in Saussure's mind, therefore, must be phonetic in nature, not phonological.

Phonetics, the study of linguistic sounds, endeavors to describe the sounds of language in terms of those sounds' qualities. These qualitites are typically noted in anatomical terms that describe the nature of a speech sound's phonation (labials, nasals, gutturals, etc.). Although phonology frequently employs the same terminology as phonetics, the fundamental procedures of the two fields of study are entirely distinct. Phonology, the study of linguistic sounds only insofar as they are meaningful, defines the minimal units of language exclusively in differential terms. Phonology, therefore, "dissout les qualités phoniques en leur substituant des propriétés phonologiques qui, de leur côté, se fondent exclusivement sur la relation d'opposition et non sur des qualités."[287] Thus, a phonetician may establish equivalences between the speech sounds of different languges on the basis of their acoustic and articulatory properties, but a phonologist, by definition, cannot. Defining a phoneme exclusively by means of its opposition to the other sounds within a given system, the phonologist may equate that phoneme only with other elements within that same system. An analogous element of another system, however similar in qualitative terms, can never be considered its equivalent from the perspective of phonology.[288]

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[287] Jean-Claude Milner, "Forme et structure ou le conte des faux jumeaux," *Les Temps Modernes* 676 (5/2013), p. 123. A phonetic quality of a given speech sound—the voicedness of the phoneme /b/, for example—may be said to be a phonological property only in languages in which /b/ is opposed to its unvoiced counterpart /p/. "B" cannot categorically be said to bear the quality of voicedness because in languages that do not oppose /b/ and /p/, the sound [p] may well fall within the phoneme transcribed <b>.

[288] It is interesting to note that in his reflections on the minimal linguistic unit, Saussure articulates the distinction between qualitative and differential definition by means of an analogy to color. Endeavoring to define the "impression acoustique" (Saussure's term for the minimal unit of language, not to be confused with the "image acoustique," or *signifiant*, of the *Cours*, whose unit is the word), Saussure wonders, "L'impression acoustique est-elle définissable ? Elle

A number of points in the vowel-color text would suggest that Saussure is indeed considering vowels from a phonetic perspective, at least at times. When he writes that the French vowel transcribed "*ou"* and the German one marked "*u*" are "the same vowel,"[289] for example, he reveals the phonetic perspective from which he is considering the two speech sounds at that moment. And this phonetic perspective, as the *Cours* later explicitly states, is the perspective not of the synchronic linguist, but of the diachronic one:

> Tout ce qui est phonétique est diachronique. […] Nous ne considérons que la partie matérielle des mots, en phonétique; mais ce n'est pas ce qui est le plus charactéristique en phonétique; ce qui est le plus charactéristique en phonétique, c'est que la phonétique est <uniquement> diachronique.[290]

The procedures of diachronic study demand a metalanguage applicable across languages and over time. If a linguist is to study "les rapports reliant des termes successifs non aperçus par une même conscience collective, et qui se substituent les uns aux autres sans former système entre

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n'est pas plus définissable que la sensation <visuelle> du rouge <ou du bleu>, laquelle est psychique, est complètement indépendante <en soi> du fait que ce rouge dépend de 72'000 <vibrations> qui pénètrent dans l'œil <ou du nombre qu'on veut>" (Saussure's corrections, marginal notes, and interlinear insertions are contained within <>. *Cours de linguistique générale*, critical edition by Rudolf Engler, Vol. 2, fascicle 4, Wiesbaden: Harrassowitz, 1974, p. 31). The "visual sensation of red," being psychological in nature, is "completely independent" from the fact that this red may be said to possesses a frequency articulable in terms of vibrations. The color "sensation," in other words, cannot be defined by the wavelength on which it depends. The same distinction is articulated with perhaps even greater clarity by Jean-Claude Milner, who, without reference to Saussure, draws precisely the same analogy: "On pourrait soutenir qu'entre le rouge qualitatif et la longueur d'onde rouge, il y a généralement synonymie référentielle, mais il n'y a jamais synonymie méthodologique ; entre le sonore phonétique, qui n'est pas oppositif, et le sonore phonologique, qui est oppositif, il n'y a jamais synonymie méthodologique et il arrive qu'il n'y ait même pas synonymie référentielle" (Milner, "Forme et structure," p. 124).

[289] Saussure cit. Flournoy, *Phénomènes*, p. 52.

[290] Ferdinand de Saussure, *Deuxième cours de linguistique générale (1908-9), d'après les cahiers d'Albert Riedlinger et Charles Patois*, ed. Eisuke Komatsu with an English translation by George Wolf, Oxford and New York: Pergamon, 1997, pp. 66-7.

eux,"[291] this linguist must have recourse to terms by which the speech sounds of distinct idioms may be put into meaningful relation—something that phonology, by definition, cannot provide.

Thus the distinctions signaled by the letters <ain>, <in>, <ein>, and <[i]en> might reflect phonetic qualities of the phoneme /ɛ̃/: qualities that might be of consequence for phonology, or might not. The letter <n>, for example, might be understood to signal the nasal quality of the vowel /ɛ̃/, a quality reflective of the nasal consonant /n/ that was, at some point, pronounced after the vowel. Without its <n>, the final vowel of *terrain* would seem to be /ɛ/, as in *quai* [kɛ]; the final vowel of *matin* would seem to rhyme with *parti* [paʁti]. Just as the letter <i> signals the particular timbre of the "-en" that follows it in the word "chien,"[292] so does the letter <n> signal the nasal quality of the vowel that precedes it in the words *chien*, *terrain*, *plein*, and *matin*. The graphemes integral to the imaginary being, read thus, would indicate particular phonetic aspects of a single phoneme. They would indicate how the phonetic environment surrounding a vowel has, over time, shaped its particular sound.

The homophonic sounds that have become "the same vowel" from the perspective of the synchronic linguist belie an array of vocalic genealogies that may be traced by the diachronic one. And from the perspective of diachrony, the final vowels of *terrain*, *plein*, *matin*, and *chien* are hardly "the same." *Terrain* derives from **terrānum*, a popular form of the classical Latin *terrēnum*, and bears the latinate suffix *-ain*; *plein* derives from the classical Latin *plēnum*; *matin*

[291] *CLG*, p. 140.
[292] The *i* is a by-product of the palatalization of the word-initial Latin /k/ (*cānus*) into the French /ʃ/ (*chien*), a phonetic development that may also be observed in such medieval forms as *laissier*, *changier*, and *chassier*. ("chien," *Trésor de la langue française,* http://www.le-tresor-de-la-langue.fr, accessed 14 July 2017); see also Georges Straka, "Remarques sur les voyelles nasales, leur origine et leur évolution en français," *Revue de linguistique romane* 19 (1955), p. 258.

from *mātūtīnum*; and *chien* from *cānum*, itself derived from Ancient Greek κύων.[293] The synchronic coincidence of sounds within the single, French phoneme /ɛ̃/ might therefore be said, by the diachronic linguist, to reflect different phonetic conditions: conditions that may no longer be of phonological consequence, or indeed even be perceptible to the speaker of Modern French, but which continue to be reflected, nonetheless, in orthography.

The reason for the difference of hue corresponding to "the same vowel" in Saussure's account, then, might not lie in orthography as such but rather in the diachronic evolution to which it attests. This would explain not only why Saussure finds that spellings inflect his color perceptions but also why he feels the need to specify that it is "only the vowels in words that, for me, have sufficiently defined colors." For vowels in words, unlike isolated vowels, are inscribed in a lineage of linguistic evolution, bearing within them invisible laws of inflection and language change.

Saussure's color perceptions, therefore, would seem to be tied to vowels' transformations over time and across languages: to the diachronic evolution absent from the synchronic perspective that understands vowels in differential terms. But we have come to a contradiction. The "synchronic perspective" from which a phoneme is differentially defined is the perspective of speaking subjects. As the *Cours* famously instructs: "La synchronie ne connaît qu'une seule perspective, celle des sujets parlants."[294] Yet he colors of Saussure's report inhere in a subject—it is from Saussure's perspective alone that the sensations of color can be said to exist at all. Thus the colors would seem to guide us toward a point in Saussure's thinking at which synchrony and

[293] "terrain," "plein," and "matin," *Trésor de la langue française,* http://www.le-tresor-de-la-langue.fr, accessed 14 July 2017.
[294] *CLG*, p. 128.

diachrony meet: a point at which his synchronic perspective betrays a latent consciousness of vowels' evolution over time.

Saussure's consciousness of the diachronic evolution of vowels was, of course, anything but "latent." During his lifetime, he numbered among the most authoritative scholars on precisely this subject. Yet Saussure draws no explicit connection between his color sensations and the diachronically discernible aspects of vowels to which they appear to be tied. Those aspects, whatever they might be, remain decidedly latent in Saussure's consciousness throughout the vowel-color text, suggesting a set of unconsidered assumptions or intuitions rather than explicit, specialized knowledge. And it is worth noting that some unconscious awareness of homophonic vowels' distinct natures might well be identified in the non-specialist as well. Even from the purely synchronic perspective of a non-specialized speaking subject, the various spellings of /ɛ̃/ that Saussure cites correspond to vowels that, while homophonic, behave differently. When the adjective "plein," for example, appears in its feminine form, "pleine" [pl**ɛn**], it takes on a different vowel sound from the feminine form of "matin," "matine" [mat**in**]. No speaker of French, even an illiterate one, would ever say "pline" [plin] or "meteine" [mat**ɛn**], though few would be able to explain why. The imaginary being may well reflect a vowel's voyages through distant tongues, but it might also be linked to the laws of apophony within a single one. *L'être imaginaire*, then, would seem to bear witness to a reading subject's unconscious knowledge of the laws of both inflection and language change—laws of which that reader is, of course, the unwitting bearer. Followed closely, its colors might betray subtle indications of where a vowel has been, as well as, perhaps, what it will become.

IV. "la teinte de tous les ciels"[295]

One of the evident questions prompted by the vowel-color text concerns its unique status. If its author saw colors in vowels, surely he must have left traces of this perception elsewhere: if not in his scientific publications, then perhaps in his notebooks on phonology or anagrams. As the vast majority of Saussure's work bears on languages other than French, any trace of his color sensations would likely be faint: "moins intense, moins développée, moins précise." It would also be unconscious, or "unobserved": for Saussure notes in his response to Flournoy, "Je n'ai guère observé si dans les langues étrangères la série des correspondances est pour moi la même qu'en français."[296] But his

passing observation that a German <**u**> prompts a visual sensation that is "basically the same" as the "beautiful, gray velvet," of its French homophone (if "incomparably less strong"), gives sufficient grounds for wondering whether traces, however faint, might be inscribed elsewhere in Saussure's writings. The structure of the color-vowel correspondences, in any case, would bode well for the search. Were Saussure's sensations prompted exclusively by realized speech sounds, they could be related to most of his work indirectly at best, as the ancient and even unattested tongues that Saussure studied were ones of which he had little, if any, aural experience.[297] But seeing as the color sensations are prompted by "imaginary beings" dependent

[295] "Essai pour réduire les mots du grec, du latin & de l'allemand a un petit nombre de racines" (1874), *Cahiers Ferdinand de Saussure* 32 (1978), p. 78.
[296] Flournoy, *Phénomènes*, p. 51.
[297] By definition, Saussure could have had no direct aural experience of Proto-Indo-European; like all the linguists of his time, his acquaintance with the aural contours of the ancient languages he studied (Sanskrit, Prakrit, Pali, "Zend" [Avestan], Old Persian, Greek, Latin, Oscan, Umbrian, Gaulish, Gothic, Old Low German, Old High German, Middle High German, Frisian, Anglo-Saxon, Old Norse, Old Church Slavonic, and Old Prussian) was primarily based on written forms and conjectured phonologies. Saussure's journey to Lithuania in the summer of 1880 afforded him direct aural experience of Lithuanian in its famously conservative modern form, but the

only on a reading subject and a written form, there is no reason, theoretically, that vowel colors could not be found lurking among Saussure's writings on ancient languages as well.

As Marco Mazzeo correctly points out, "l'attention de Saussure pour les structures vocaliques des langues historico-naturelles, tellement extrême qu'elle peut paraître parfois injustifiée, constitue une vraie constante de sa production."[298] For while Saussure is undoubtedly best known today for the *Cours de linguistique générale*—a palimpsestic, posthumous work compiled and published by his students—he was known during his lifetime as a scholar of Indo-European linguistics whose most prominent publication bore, precisely, on vowels. Mazzeo's reference to Saussure's "extreme" and even perhaps "unjustified" attention to vocalic structures alludes, unmistakably, to this publication, Saussure's master's thesis on the *Mémoire sur le système primitif des voyelles dans les langues indo-européennes* (1879). In this text, which—unlike the *Cours*—reflects Saussure's own rhetorical choices, vowels appear to be synonymous with, or in possession of, distinctive "hues" (*teintes*) and "colors" (*couleurs*).[299] Saussure notes

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experience, which could have lasted a maximum of 14 days, appears to have been the opposite of illuminating. Rather than affording him insight into the intonation system of the language, the excursion convinced Saussure that no one who was not a native speaker of the tongue could hope to contribute to the elucidation of its accentual system through direct observation. "There is in effect no foreign observer capable of *discovering* Lithuanian accentuation," Saussure writes in an undated manuscript that appears to have been penned upon his return from Lithuania in 1880; "one cannot carry the first axe into this virgin forest, without having been born Lithuanian. I leave aside all the difficulty that a foreign ear has in grasping this accent; I am supposing a perfect and ideal <ear>: even then, the observer would find it impossible to obtain a general idea of the accent" (BGE Ms. fr. 3953, f. 224 recto and verso; cit. and trans. Joseph, *Saussure*, p. 273). All extant documents suggest that although Saussure continued to work on Lithuanian, he relied exclusively on the published literature, making no reference to his 1880 attempt at "field work" (Joseph, *Saussure*, pp. 272-3).

[298] Mazzeo 2004, p. 130.

[299] Ferdinand de Saussure, *Mémoire sur le système primitif des voyelles dans les langues indo-européennes,* Leipzig: Teubner, 1879. Saussure's color terminology appears in both appositive and possessive grammatical constructions, alternately suggesting identity ("la couleur *o*") and possession ("la couleur de l'*e*"). He notes "la teinte *u*" (12), "les deux teintes ε et α" (20), and "la couleur *o*" (51), for example, but he also refers to "la couleur de l'*e*" (19) and describes how a

the opposition of the vowels ε and α in Ancient Greek, for example, as "les deux teintes ε et α,"[300] and in tracing the behavior of a particularly chameleonic "mute vowel," he observes that "les formes comme ἐρ**ε**-τμόν, κἐρ**α**-μος, ἄρ**ο**-τρον, ἀρ**ι**-θμός indiquent que la voyelle muette peut prendre quatre couleurs différentes, sans qu'on voie du reste ce qui détermine l'une d'elles plutôt que l'autre."[301] Where a modern linguist would most likely use the term "timbre" to designate the difference of sound quality distinguishing one vowel from the next,[302] Saussure consistently refers to a vowel's "hue" (*teinte*), "coloration" (*coloration*), or "color" (*couleur*). These terms are ones that the science of linguistics has read, for more than a century, as metaphors, understanding that the "hue" or "color" of a vowel is something that is heard. Indeed, the term "color" continues to be used to this day to designate the difference in sound by which one vowel may be distinguished from the next. But while a twenty-first century speaker might

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vowel "is (dis)colored by" or "takes on" a shade or color from a neighboring sound ("Dans *ὄμβρος* la voyelle [noted as both *a* and α] a pris une teinte plus obscure," 278; "l'υ (*u*) vient d'une consonne d'organe labial qui a déteint *sur une voyelle irrationnelle*," 99). A side note: an "irrational vowel" appears be "un phonème indéterminé" particularly susceptible to coloration by neighboring phonemes; it is a colorless vowel that can undergo transformations other vowels cannot (see also the *Recueil des publications scientifiques de Ferdinand de Saussure,* Geneva: Société anonyme des éditions sonor, 1922, p. 41). "Ainsi dans *ἀνώνυμος*," Saussure explains, "il n'y a pas eu transformation de l'o d'*ὄνομα* en *u* : le phénomène remonte à une époque où à la place de cet *o*, n'existait qu'un phonème indéterminé. C'est ce dernier que *μ* put colorer en *u.*" The /u/ sound of Greek ἀνώνῡμος ("anonymous") does not represent a discoloration of the *o* of the word ὄνο̲μα ("name"); rather, both the medial *o* of ὄνομα and the *u* of ἀνώνυμος descend from "an indeterminate phoneme" that has taken on the color *o* in the case of ὄνομα and the color *u* in the case of ἀνώνυμος. Although Saussure attributes the second coloration of the "indeterminate phoneme" to the neighboring nasal, *μ,* it is not entirely clear how he comes to this conclusion, as the medial *o* of ὄνομα is also followed by *μ*.

[300] *Mémoire*, p. 20.

[301] *Mémoire*, p. 180, emphasis mine.

[302] In a 1926 article discussing Saussure's *Mémoire*, for example, Jerzy Kuryłowicz moves easily between the term "timbre" (which Saussure almost never uses) and Saussure's vocabulary of "coloration." Kuryłowicz notes that "certains *e* se trouvent colorés en *a* dès l'époque de la communauté indo-européenne," adding in a footnote to an example that the "*e* acquiert, avant la contraction, le timbre *a*" ("ə indoeuropéen et ḫ hittite," *Symbolae grammaticae in honorem Ioannis Rozwadowski* ed. Witold Taszycki and Witold Jan Doroszewski, Vol. 1, Krakow: Jagiellonian University Press, 1927, p. 96).

well use the term "color" to refer to the difference in sound distinguishing an /a/ from an /o/, for example, this same speaker would not hesitate to explain that the term "color," in this context, is merely homophonic with the "color" belonging to objects seen in the world. In contemporary parlance, vowel "color" refers to an exclusively aural phenomenon.

And yet, in light of the vowel-color text, one wonders how Saussure himself understood these terms. Saussure's use of color terminology in describing vowels may be traced at least as far back as his 1874 "Essai pour réduire les mots du grec, du latin & de l'allemand a un petit nombre de racines," an amateur effort he penned at the age of sixteen.[303] The "Essai" advances the theory that languages appartently distinct (German, Latin, Greek) can all be demonstrated to contain words deriving from "nine primitive words" (*neuf mots primitifs*) or "roots" (*racines*). These nine primitive roots, Saussure proposes, are each composed of a single vowel flanked by consonants. The consonants, represented by the letters "P," "T," and "K," reflect wide ranges of sound whose defining feature is their place of phonation. As Saussure explains in a chart drawn out on the opening page of his essay, P, T and K are less specific speech sounds than shorthand notation for classes of sounds that exist in all the languages under consideration: gutturals (K), labials (P), and dentals (T):[304]

[303] Saussure suggests in his 1903 "Souvenirs" that he composed the essay in the summer of 1872; Roman Jakobson subsequently offers this date in his 1969 article "Saussure's Unpublished Reflections on Phonemes" (*Cahiers Ferdinand de Saussure* 26 [1969], pp. 5-14; reprinted in Roman Jakobson, *Selected Writings* I, pp. 743-50), as does Boyd Davis in his introduction to the *Essai*, published in *Cahiers Ferdinand de Saussure* 32 (1978), pp. 73-101. As John Joseph has convincingly demonstrated, however, Saussure's 1903 recollection must have been slightly off, as the essay can only have been written in the summer of 1874. See Joseph, *Saussure*, pp. 152-8, as well as his "Two Mysteries of Saussure's Early Years Resolved," *Historia Linguistica* 34 (2007), pp. 155-66.

[304] Saussure, "Essai," p. 77.

1º les *Gutturales :*

K, Γ, X, Ξ	– en grec
C, G, H	– en latin
K, G, H, Ch	– en allemand

2º les *Labiales :*

Π, B, Φ, Ψ, M
P, B, F, V, M
P, B, F, V, W, M

3º les *Dentales :*

Τ, Δ, Θ, Z, Σ, N
T, D, J, S, N
T, D, Th, Z, S, N

As for the vowel, marked "A," it is both all the vowel sounds of these languages and none in particular. While consonants belonging different languages may be classed and equated, Saussure argues, "[l]a voyelle, élément changeant, qui prend la teinte de tous les ciels sous lesquels elle voyage, ou qui s'efface complètement, ne saurait servir d'indice certain."[305] Two points in his formulation are worth retaining. The first is its claim: with vowels, it is difficult, if not impossible, to discern distinct classes potentially revelatory of relations between languages. Words that bear nearly homophonous forms but belong to different languages—words that might otherwise be taken to suggest a shared parentage—contain vowels so apparently dissimilar as to defy comparative study. Lacking the distinctive "place of phonation" feature by which the consonants of different languages may be grouped and equated, vowels are useless to the linguist in search of systematic phonetic similarity.

The second point to note is the specific analogy Saussure draws between reflective, presumably aqueous, surfaces and vowels. Just as a stream glinting amber at sunset may well appear gray in an overcast dawn, so may a vowel that manifests itself as ε in Greek turn up in Latin as *a* and in German as *o*. The elements Saussure's analogy draws into relation are not

[305] Saussure, "Essai," p. 78.

merely vowels and reflective surfaces, however, but, more specifically, "the hues of all the skies" (*la teinte de tous les ciels*) that a surface may reflect, and the timbres of all the languages that a vowel may assume. The "hue" of Saussure's formulation thus forms part of an analogy, but it also constitutes a pun *avant la lettre*: simultaneously referring to celestial colors and to vocalic timbres as *teintes*.[306]

One might well wonder wherein the identity of such a chameleonic "vowel" inheres. If a given vowel can be clad in ɛ, in *a*, and in *o*—and for that matter, disappear entirely—in what way can it be said to be one and the same vowel? For, by its conventional definition, as vowel is defined, precisely, by its timbre.[307] The question of how to establish equivalence and difference between the vowel sounds that occur in different words goes unaddressed in the "Essai," whose ambitions are limited to the establishment of nine primitive roots, consonantally defined. For the purposes of the 1874 text, the undifferentiated "vowel" intuited to be required by the mechanics of phonation need never be set in opposition to any other vowel sound. Thus, Saussure devotes nothing more to it than a place-holding symbol, "A." Like the V of contemporary linguistic notation, which marks not the sound /v/ but the presence of a vowel, Saussure's "A" is algebraic

[306] The pun on the technical term (between *teinte* in the visual sense of "hue" and *teinte* in the acoustic sense of "timbre") is very likely anachronistic, but behind it lurks another, older pun between the verbs *tinter* ("to chime") and *teinter* ("to dye, stain, color"). *Tinter* (attested as early as 1100) derives from the Late Latin *tinnitare*, itself derived from the earlier *tinnire* ("tinter, rendre un son clair," "faire entendre des sons," "faire tinter l'argent"). The homonymic *teinter* is a later verbal variant (attested 1410 in Anglo-Norman) of the synonymous *teindre* (attested c. 1100), which may be traced back to the Latin *tingere* ("mouiller, tremper, imprégner"). ("Tinter," "teinter," and "teindre," *Trésor de la langue française,* http://www.le-tresor-de-la-langue.fr, accessed 15 July 2017).

[307] "Les sons […] distingués par le **timbre** sont dits « voyelles ». Le **timbre** est donc la qualité fondamentale d'une voyelle, celle qui la distingue des autres" (Georges Le Roy, *Grammaire de la diction française,* Paris: Delaplane, 1912, p. 39, emphases Le Roy's). This timbre is, of course, shaped by the particular positioning of the human speech apparatus and may therefore be articulated in anatomical terms, as well ("open/closed," "palatalized/nasalized," etc.). On this point, see Chapter 1, "The Proper Tone: Hermann von Helmholtz's *Klangfarben der Vokale*."

rather than phonetic in nature, marking an unknown value *x* within a given linguistic expression.[308]

This vocalic variable "A" re-emerges, in a way, in the *Mémoire sur le système primitif des voyelles dans les langues indo-européennes*, which Saussure published less than five years later. As the opening lines of the text announce, its object of study is in no way straightforward: "Étudier les formes multiples sous lesquelles se manifeste ce qu'on appelle l'*a* indo-européen," Saussure writes, "tel est l'objet immédiat de cet opuscule."[309] The object of study, "what one calls the Indo-European *a,*" is identified not as a discrete and homogenous entity but rather as something, or perhaps some things, that have been referred to under a single name: "*a*." Whether singular or plural in nature, this "*a*" "manifests itself" (or, perhaps, its selves) in "multiple forms."

This "*a*" that might have appeared, to the untrained eye, to be singular in nature is quickly established as comprising a number of discrete entities. Saussure cites the origin of the "*a*" he will be discussing in the foundational text of Indo-European linguistics, Franz Bopp's 1833 *Vergleichende Grammatik des Sanskrit, Zend, Griechischen, Lateinischen, Litthauischen, Gothischen und Deutschen*, which observes that "en regard des trois voyelles *a e o* des langues européennes, l'arien montrait uniformement *a*."[310] This *a* is soon revealed to constitute a more circumscribed entity than the "A" of Saussure's 1874 "Essai," as this *a* is already opposed to two other vowels, marked "*i*" and "*u.*" "[P]artant de l'idée reçue que la langue-mère ne possédait que les trois voyelles *a i u*," Saussure explains, the next significant scholar of "*a*," Georg Curtius,

[308] See John Joseph, "« La teinte de tous les ciels » : divergeance et nuance dans la conception saussurienne du changement linguistique," *Cahiers Ferdinand de Saussure* 63 (2010), p. 148.
[309] *Mémoire*, p. 1.
[310] *Mémoire*, p. 2.

observed that "l'*e* apparaît à la même place dans toutes les langues d'Europe, et qu'elle ne peut par conséquent s'être développé indépendamment dans chacune d'elles."[311]

Both Saussure's reference to "la langue-mère" and the imputation of causality conveyed in the adverbial phrase "par conséquent" require a moment's explanation. Both expressions signal the *Mémoire*'s belonging to the nineteenth-century science of Indo-European linguistics, a summary understanding of which is requisite to any discussion of Saussure's text.[312] Indo-European linguistics, unlike the "Saussurean linguistics" that took the *Cours* as its founding document, sought to articulate the relationships linking the languages of the Orient and the Occident and, by means of these relationships, to identify the languages' points of divergence in time. This "time" differs from historical time in that it is relative in nature: it is important only

[311] *Mémoire*, p. 2.

[312] It could be argued that the "Essai" already participated, in a way, in the Indo-European project, but appreciable differences nonetheless separate that work from the decidedly Indo-European *Mémoire*. Saussure addressed his "Essai" to his neighbor Adolphe Pictet after reading Pictet's *Les origines indo-européennes, ou Les Aryas primitifs : essai de paléontologie linguisique* (Paris: Cherbuliez, 1859); he is thus perfectly aware of the Indo-European hypothesis by which the languages of the Orient and the Occident descend from a shared, singular tongue. In establishing the minimal components by which his "primitive roots" might be recognized, for example, he writes, "Si une séparation des peuples avait eu lieu à ce moment dans la race dont nous parlons, serait-il possible de reconnaître aujourd'hui une même origine aux idiomes de ces peuples ? Non, certainement. Ces racines sont encore trop peu caractérisées […]" ("Essai," p. 78). As his hypothetical clause indicates, however, Saussure does not seem entirely convinced by Pictet's "linguistic paleontology," and the search for a single tongue spoken by a single tribe of people seems less to motivate his essay than to provide an excuse for his ruminations on the similarities he perceives to exist among the three languages he was studying at the time. As Saussure states in the opening lines of his essay (under the subtitle "*Naissance du Langage*"), the circumstances by which language developed historically are essentially accessory to the "idea" he wants to convey. "Rassurez-vous," he begins, compellingly: "ce chapitre n'a aucune prétention à faire des théories ; c'est simplement un échaffaudage provisoire qui n'aura plus qu'à disparaître une fois qu'il aura servi à vous introduire dans mon idée" ("Essai," p. 77). The reassurance is not false: the vast majority of the text is devoted to structural comparisons, with questions of chronology and etiology falling entirely by the wayside.

insofar as it facilitates the reconstruction of the sequence of linguistic divergence.[313] The particularity of the project is perhaps most swiftly grasped by means of its axioms, which, as Jean-Claude Milner has demonstrated, are but two. The first is that observable similarities between different languages admit of etiology. For the Indo-Europeanist, homophonies between languages recognized to be distinct are not the products of chance, but the effects of a cause (hence Saussure's, or perhaps Curtius's, "par conséquent"). The second axiom is that this cause is a language. The cause-language, referred to by its seekers as "Indo-European," or, at times, "la langue-mère,"[314] is singular and unattested: although it can be reconstructed on the basis of extant languages, it itself cannot be directly observed through any material artifact. Indo-European, therefore, "n'est pas simplement une langue morte, semblable au latin, qui n'est plus parlé, mais qu'il est toujours possible de rapporter à des sujets : l'indo-européen, lui, n'est jamais en position de pouvoir être supposé langue maternelle pour des sujets, même disparus."[315] "La langue-mère," in other words, by its very nature, can never coincide with any "langue maternelle."

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[313] Herein lies one of the cardinal distinctions between diachronic linguistics and history: as Milner explains, "La méthode de la linguistique diachronique n'a rien de commun avec la méthode historique proprement dite. Notamment, la première ne se préoccupe pas de datations absolues (quand bien même elle peut en donner); elle se préoccupe seulement de datations relatives (telle donnée est-elle antérieure ou postérieure à telle autre?)" (*Le périple structural*, Paris: Verdier, 2008, p. 52).

[314] What modern linguists call "Proto-Indo-European" appears in nineteenth-century sources under the names of "Indo-European" (*indo-européen*, *Indoeuropäisch*) and "Indo-German" (*Indogermanisch*), as well as "the proto-language" (*Ursprache*) and "the mother language" (*la langue mère*). In the *Mémoire*, Saussure uses *indo-européen* and *la langue mère*; in the interest of philological and historical specificity, I retain his terms.

[315] Milner, *L'amour de la langue,* pp. 98-9. Milner points out that Sanskrit and Hittite offer two striking illustrations of Indo-European linguists' insistence on the unattested nature of the cause-language: "tour à tour plusieurs langues réelles ont pu jouer le rôle de la langue-cause incarnée : ainsi le sanscrit et, bien plus tard, le hittite. À chaque fois, la discipline s'est développée en les traitant comme langues-effets" (98fn).

Saussure's object of study, "what one calls the Indo-European *a*," ostensibly partakes of this curious cause-language: it is a hypothetical vowel belonging to a constructed tongue, "à la fois l'origine et l'écho d'un ensemble de formes observées."[316] In Saussure's thesis, however, this *a* is not "a" hypothetical vowel, as in Bopp's *Vergleichende Grammatik*, but four distinct entities: "four different terms" (*quatre termes différents*). The novelty of Saussure's 1879 thesis lay in its argument that the vowel system of Proto-Indo-European possessed not one *a* but "*quatres espèces d'*a," which Saussure marks with the symbols A, A_2, a, and a_2.[317] Although derived from the vowel systems of the Indo-European languages, these four *a*s, like the *A* of the "Essai," operate not as phonetic letters, but as place-holders. Contrary to what graphic convention might lead one to expect, A, A_2, a, and a_2 do not denote distinct timbres, but four distinct—if unattested—vowels of unknown timbre, whose existence may be inferred from the overall behavior of the vowels in the Indo-European languages. Saussure is explicit on this point. "Quand nous voudrons parler du *son* a ou de l'a en général, et non de la voyelle indo-européenne que nous entendons par *a,*" he writes in his first introduction to the work, an essay published in 1878, "nous emploierons le caractère ordinaire au lieu de l'italique."[318] The algebraic *a*s are thus

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[316] Milner, *L'amour de la langue*, p. 99.

[317] See Saussure, *Mémoire*, pp. 1-5. Saussure's leap from one *a* to four *a*s is mediated by a considerable amount of intervening scholarship (Curtius, Fick, Schleicher, Amelung, Brugmann), which went so far as to concede the existence of three distinct *a*s in the European languages. Following his overview of the literature, Saussure summarizes, "On voit qu'en résumé, pour ce qui est des langues de l'Occident, les différents auteurs, quel que soit leur point de vue, opérent avec trois grandeurs: l'*e,* l'*a*, et l'*ā*" (5). The originality of Saussure's thesis thus lay not only in its proposal of a fourth *a* but, more audaciously, in its contention that the multiplicity of European *a*s could be demonstrated to have existed in Indo-European. "Ces quatres espèces d'*a* que nous allons essayer de retrouver à la base du vocalisme européen," he announces, "nous les poursuivrons plus haut encore, et nous arriverons à la conclusion qu'ils appartenaient déjà à la langue mère d'où sont sorties les langues de l'Orient et de l'Occident" (5).

[318] Ferdinand de Saussure, "Essai d'une distinction des différents *a* indo-européennes," *Mémoires de la Société de Linguistique de Paris* 3.5 (1877), p. 362.

clearly distinguished from "the *sound* a" as well as from "a in general," this last referring to all that has fallen under the name of "a": "un agrégat qui n'a point d'unité organique."[319]

The four Indo-European *A*s whose distinct existences Saussure seeks to demonstrate possess no set timbres; like the *A* of the "Essai," these *A*s assume different hues over the course of the *Mémoire*. In tracking the behavior of the Indo-European *a*, for example, Saussure notes that "ce que nous appellerons *a* […] *apparaît en slave sous la forme de o,* mais peu importe : un tel *o* est adéquat à l'*a* du lithuanien et du germanique; la couleur *o* ne fait rien à l'affaire."[320] While *a* is a hypothetical vowel—and therefore presumably possessed of a timbre, albeit an unknown one—it may "appear" in attested languages "in the form of *o*," a vowel which may be considered "adequate" to the "Lithuanian and Germanic *a*." Thus, Saussure's Indo-European *a* would appear to be dual in nature: referring at once to a vowel of unknown timbre in the proto-tongue, and to a set of attested Indo-European vowels whose link to that proto-vowel resides in something other than timbre.

This "something" is never explicitly defined and extremely elusive in nature. One may argue for its existence on the basis of a vowel's occurence within a word that appears in different forms or inflections within a single language (e.g., *sing sang sung song*), as well as a vowel's occurence in a word's analogues in other languages (e.g., ἀστέρι*, stella*, *astre*, *star*). These analogues are established not only on the basis of meaning and part of speech (as are synonyms within a single language, for example), but also—often primarily—on the basis of their phonetic resemblance.

Establishing the defining features by which the attested Indo-European descendants of *A*, A_2, *a*, and a_2 may be distinguished is, in essence, the task of the *Mémoire*. One might illustrate its

[319] Saussure, *Mémoire*, p. 5.
[320] Saussure, *Mémoire*, p. 51. Italics Saussure's.

method through any number of examples. In Ancient Greek and the early Italic languages, for instance, Saussure notes an alternation between *e* and *o* that is "absolument régulière (ἔτεκον : τέτοκα, τόκος. tego : toga)."[321] In none of these languages, however, does *a* alternate with *e*.[322] "Comment l'*a* et *l'o* des langues du sud pourraient-ils donc être sortis d'un seul et même *a* primitif ?," Saussure inquires: "Par quel miracle cet ancien *a* se serait-il coloré en *o*, *et jamais en a*, précisément toutes les fois qu'il se trouvait en compagnie d'un *e* ?—Conclusion : le dualisme : *a* et *o* des langues classiques est originaire."[323] Thus the *e*s and *o*s of the early Greek and Italic languages are established within a single lineage distinct from that of *a*.

Despite its italicization, this "*a*" represents not the *a* of the hypothetical Indo-European *A*, A_2, *a*, and a_2[324] but rather the *a* of Classical Latin as well as the α of Ancient Greek. Thus, it signals a second system of vowel representation at work in the *Mémoire*, the one that transcribes the attested Indo-European vowels. These vowels also merit a moment's scrutiny. As the reader will have noticed, it is they, and not the algebraic *A*, A_2, *a*, and a_2 that appear to bear, or be, "colors." But to which vowels does Saussure refer when he notes "les deux teintes ε et α" or when he argues that a_2 has been "coloré en *o*"? Considering these quotations in the context in which they appear, one might well be tempted to conclude that ε, α, and *o* refer to the phonemes of the Ancient Greek and Italic tongues. There is no lack of clarity in Saussure's text as to the languages under consideration; the "hues" or "colors" of these vowels thus refer, or attach, to the speech sounds of those languages. A closer look at Saussure's formulations, however, suggests that this conclusion may be a trifle premature. Which *o* is it after all: the Latin one or the Greek

[321] Saussure, *Mémoire*, p. 51.
[322] Except when the root contains a liquid or a nasal sonant (r, l, m, n), in which case the timbre of the vowel represents a later development caused by the quality of that liquid or nasal (Saussure, *Mémoire*, p. 51).
[323] *Mémoire*, p. 51. Italics Saussure's.
[324] Within the algebraic vowels, it in fact represents *A*, not *a*; *e* and *o* represent the algebraic *a*.

one? And when Saussure observes that "la voyelle qui s'est développée devant [la nasale sonante] a pris, dans plusieurs idiomes, la couleur de l'*e*,"[325] what sort of *e*, specifically, does he have in mind? This "*e*" does not appear to partake of any language in particular but, rather, can appear in "plusieurs idiomes."

The question is not trivial. For as anyone literate in more than a single language knows well, what is marked <e> in one tongue may bear little relation to what is marked by the very same character in another. And even if both langages were to be transliterated by means of a single, phonetic alphabet, as is more or less the condition of the languages studied in the *Mémoire*,[326] what was marked <e> in one language would still not be entirely commensurate with what was marked <e> in the next. The transcription enabled by a process of phonetic approximation, however precise, would merely mask the definitional incommensurability of the phonemes of different languages. It would suggest that the <e> of one language is identical to the <e> of the next, which might or might not be true in phonetic terms, but which would never be so phonologically.

The *e* whose "color" may be "taken" by the phonemes of "multiple idioms," then, is essentially a phonetic category: an aggregate similar in nature to the "Gutturals," "Labials," and "Dentals" under whose headings Saussure classed the consonants of German, Latin, and Greek in the 1874 "Essai." Just as the symbols "P," "T" and "K" enable the Saussure of the "Essai" to equate these languages' consonants, so do the "colors" ε, α, and *o* create pan-linguistic categories by means of which Saussure may equate the vowels of the Indo-European languages. The two systems, however, differ in two significant respects. First, the consonantal classes of the "Essai"

[325] Saussure, *Mémoire*, p. 19.
[326] With the exception of Greek, which is rendered in Greek characters, all of the languages Saussure cites are offered in standard transliterations into the Roman alphabet.

were presumed to constitute the consistent and distinctive element that could be traced back to the nine "primitive roots." The vocalic color classes of the *Mémoire*, however, do not identify the consistent and distinctive element by which a vowel's diachronic lineage may be traced. That elusive element is marked *A*, A_2, *a*, or a_2. Second, whereas the categories marked "P," "T," and "K" in the "Essai" are defined by place of phonation, what distinguishes "the color *i*" from, say, "the color *u*" is entirely unclear. Saussure simply assumes an unstated division that separates "the color *a*" from "the color *o*." These italicised vowels indicate sounds whose aural contours the reader is presumed to understand, although the sounds themselves cannot precisely be said to be the sounds of any earthly tongue. Strictly speaking, they are constructed vowels, phonetically conceived and yet as impossible to observe directly in material form as Indo-European itself.

Saussure's *Mémoire* thus presents not two systems of vowel notation but three:

1) the vocalic variables of Indo-European, marked *a*, a_2, *A*, *and* A_2
2) the phonologically defined vowels of particular languages, rendered in their own alphabets (Latin, Greek), or approximately transliterated into Roman characters (as in the case of the Indic languages)
3) the phonetically defined vowels that may be identified in multiple idioms and are marked with the Roman characters *a*, *e*, *i*, *o*, *u*, and *y* as well as, occasionally, the Greek characters α, ε, ι, ο, and υ.[327]

The symbols of the first system are algebraic variables contrived to facilitate diachronic study; the symbols of the second represent the speech sounds of attested Indo-European languages; and the symbols of the third denote phonetic aggregates of linguistic sound whose internal divisions are never explicitly defined.

[327] The Greek characters are explicitly equated with their Roman corollaries and are freely interchanged with them. For example: Saussure uses the Roman *u* rather than the Greek *υ* when discussing ἀνώνυμος, writing, as the reader will recall, "il n'y a pas eu transformation de l'o d'*ὄνομα* en *u*" (*Mémoire*, p. 99). Greek letters can also operate as phonetic designators, however. Saussure elsewhere notes that "la liquide développa […] une voyelle de soutien, qui serait certainement un α dans tout autre dialecte, mais à laquelle l'éolien donne la teinte ε" (*Mémoire*, p. 46).

The three representational systems, though distinct, may interact. The four algebraic variables of system one, for example, are said to be "reflected" (*reflétée)* or "represented" (*représentée*) by the letters representing the phonemes represented in the symbols of system two (the speech sounds of attested languages), which themselves are often grouped into the broad phonetic categories of system three. Saussure explains in his 1878 article, for example, that "il y a une espèce d'*a* indo-européen reflétée en sanscrit par *i* ou *u* devant les liquides, et dans les langues classiques par *a* ou *o* devant les mêmes consonnes."[328] The symbolic variable, the "indo-european *a*," may be "reflected" in Sanscrit by the vowels "i" and "u," and in Latin and Greek by the vowels "a" and "o." The first *a* is a variable possessed of no secure aural attributes; *i*, *u*, *a*, and *o* are phonemes of Sanskrit, Latin, and Greek.[329] The equation of the *a*s and *o*s of "the classical languages," however, points to a conception of those vowels in the phonetic terms of system three. The three systems of representation, then, might be consideres as three alphabets aimed at the description any given vowel. The first alphabet notes the vowel's diachronic lineage, the second its phonemic status in a given language at a given moment in time, and the third its phonetic "color."

But is one more alphabet. Early in the *Mémoire*, Saussure introduces a class of sounds that he calls "*coefficients sonantiques*" or "resonant coefficients." The coefficients, as their name suggests, are phonetically stable entities (in the manner of the gutturals, dentals, and labials of

[328] "Essai," 1878, p. 361.

[329] The algebraic symbols even enter into contact with the letters meant to transcribe the speech sounds of attested languages. In discussing the development of Sanskrit diphthongs, for example, Saussure proposes that the diphthong "*au* du skr. *staúti*, *yaúti*, etc. […] soit de préférence $a_1 i$ et $a_1 u$" (*Mémoire*, p. 128). The first letter is a variable, a hypothetical sound of a constructed language; the second is a Sanskrit phoneme, a speech sound proper to an attested tongue. What Saussure intends the symbol "a_1" to represent here, of course, is not in fact "a_1," but the Sanskrit "a" of "*staúti*, *yaúti*, etc.," a slippage in symbolic representation indicative of the degree to which the abstraction "a_1" may be equated with the attested Sanskrit "a."

the "Essai") that condition the behavior of the vocalic variables that stand beside them (*a*, a_2, *A*, and A_2). Like these hypothetical vowels, the resonant coefficients are posited as "primordial phonemes" of Indo-European and count among their number liquids (r, l), nasals (m, n), and two hypothetical phonemes marked "A" and "o̯".[330] What makes these sounds collectively form a class is that they function both as consonants and as "sonants": phonemes that form the primary support for a syllable.[331] When they appear as "consonants" sounding with a neighboring vowel, the *coefficients sonantiques* condition the quality of its sound; when that vowel is absent, they become "sonants," independently furnishing the basis for a syllable.

Saussure easily relates the liquid and nasal sonants to existing phonological structures in Sanskrit, Greek, Latin, Gothic, Lithuanian, and other languages still, explaining how the Greek αρ, αλ, ρα, and λα, for example, may be undertood as traces of a primordial resonant coefficient ṛ.[332] But for "A" and "o̯," Saussure does not point to any attested phonemes in order to advance his argument that these elements existed in the proto-tongue. This is because, at the time that Saussure was writing, there was no known speech sound in any attested language to which "A" and "o̯" could be demonstrated to correspond. Saussure merely hypothesized the existence of such phonemes on the basis of the entire Indo-European vowel system, whose behavior led him to infer that there must have been two elements that, at some point, disappeared: two

[330] "A" and "o̯" are marked with graphemes that typically suggest vocalic sounds, and they are said to participate in the vocalism of Indo-European, but they are always noted, cautiously, as "phonemes"—not "vowels."
[331] Some of the speech sounds commonly referred to as "consonants" can form the basis for a syllable in the absence of a vowel. Examples of such syllabic consonants include the terminal nasals of the German "sieben" [zi:bn̩] and the English "rhythm" [ɹɪðm̩].
[332] See *Mémoire*, pp. 6-50.

"coefficients" that conditioned their neighboring vowels' behavior, causing those vowels to take on different colors than they otherwise would have.[333]

Saussure based his exceedingly tenuous argument on the existence of particular long vowels that seemed, in a number of languages, to demonstrate a systematic relationship to their short counterparts: *a* and *ā*, *o* and *ō*. Suspecting that it must be possible to trace these vowels' lineage by means of a single set of terms, Saussure advanced the hypothesis that, in certain instances, *ā* might be understood as a contraction of either a_1+*A,* or a_2+*A* and *ō* as a contraction of a_1+ o̯ or a_2+o̯.[334] The first letter in each expression (a_1, a_2) is a hypothetical vowel of Indo-European, the second (*A*, o̯) a hypothetical *coefficient sonantique*. These second letters are thus, paradoxically, both variables and coefficients: they are hypothetical phonemes of the primordial tongue, but they are also phonetically stable entities possessed of a defining feature comparable to the articulatory features defining the liquid and nasal sonants. In the case of "A" and "o̯," that defining feature appears as nothing more than a propensity toward coloring neighboring vowels with a particular hue. For "A" and "o̯," it bears stressing, do not mark the phonemes *a* and *o* or α and o, despite their near homography with these symbols, nor do they represent "la teinte α" and "la couleur *o*." Algebraic variables representing the conjectured phonemes of a constructed language, "A" and "o̯" stand in for purely theoretical speech sounds whose phonetic qualities are entirely unknown. In the absence of positive, empirical evidence, all Saussure can cite in support of his bold proposition is a scarcely discernible pattern of vocalic lengths and colors sounding through the extant Indo-European tongues. Perceiving that pattern as no one before him had done, Saussure argued that it could only be explained by means of two distinct, primordial

[333] Saussure's discussion of A and o̯ is in §11 of the *Mémoire*, "Role grammatical des phonèmes A and o̯. Système complet des voyelles primordiales" (*Mémoire*, pp. 134-84).
[334] *Mémoire*, pp. 134-5.

phonemes: phonemes that might not survive in any material form, but which might still be reflected in the hues of the vowels beside which they once stood.

Coda: The Laryngeal Theory

Two years after Ferdinand de Saussure died in 1913, a Czech linguist by the name of Bedřich Hrozný deciphered an ancient cuneiform language that had recently been rediscovered by archaeologists in Anatolia. The language, now known as Hittite, was found to bear striking similarities to the older Indo-European languages, but it presented two puzzling phonemes that could not be convincingly placed within the established lineage of their speech sounds. The unknown elements remained a mystery for over a decade, until the Polish linguist Jerzy Kuryłowicz observed that they behaved in precisely the manner of the unattested c*oefficients sonantiques* of Saussure's theory.[335] "A" and "o̯," in other words, were demonstrated to correspond to phonemes in an attested language.

The discovery validated Saussure's theoretical speculations, posthumously transforming him into the founding figure of what is now known as "the laryngeal theory."[336] But it is interesting to note that Saussure's system of *coefficients sonantiques* differs from the laryngeal

[335] Jerzy Kuryłowicz, "ə indoeuropéen et ḫ hittite" (1926), *Symbolae grammaticae in honorem Ioannis Rozwadowski* ed. Witold Taszycki and Witold Jan Doroszewski, Vol. 1, Krakow: Jagiellonian University Press, 1927, pp. 95-104. See also Katz, "Saussure's *anaphonie* : Sounds Asunder," pp. 170-1. For an extensive account of the history, decipherment, and writing systems of Hittite, see Mark Weeden's *Hittite Logograms and Hittite Scholarship*, Wiesbaden: Harrassowitz, 2011.

[336] Saussure himself never uses the term "laryngeal," which was coined by the Danish linguist Hermann Møller in 1906. Saussure's expression *coefficients sonantiques* reflects his conviction that linguistics proper requires an algebraic vocabulary that makes no reference to the mechanics of phonation. Interestingly, in a 1962 study, Émile Benveniste uses the by-then standard term "laryngeal," but maintains that the laryngeals should be conceived in algebraic rather than phonetic terms. "On a trop cherché à convertir les laryngeales et réalités phonétiques," he contends, noting that he personally has "toujours pensé que le statut qui leur convenait présentement était celui d'être algébraiques. Loin d'en être gênée, la reconstruction indo-européenne s'en trouve facilitée. Les modèles de reconstruction ne doivent pas dépendre d'interprétations phonétiques encore largement conjecturales et qui seraient nécessairement « historiques »" (*Hittite et indo-européen*, Paris: Maisonneuve, 1962, p. 10).

theory it anticipates in one telling aspect. For while the theory Saussure posited in 1879 identifies two types of unattested resonant coefficients, students of laryngeal theory today typically learn that there are not two types of such sounds but three. "*h_1," "*h_2," and "*h_3," as they are conventionally noted, mark the positions of three distinct types of sounds. *h_2, the "a-colouring laryngeal," draws its lineage from the hypothesized sound Saussure marked in his thesis with the symbol "A," and *h_3, the "o-colouring laryngeal," corresponds to the sound Saussure marked "o̯." But the first of the three laryngeals recognized by twenty-first century linguists, *h_1, bears no trace in Saussure's study of the primitive vowel system of the Indo-European languages. The question thus arises: why would Saussure have missed it?

Although *h_1 is similar to *h_2 and *h_3 in the decisive role it plays in determining vowel length, it differs from the other two laryngeal types in that it exercises no effect on vowel timbre, or "color": hence its designation as the "non-colouring" or "neutral laryngeal."[337] Otherwise put: *h_2 and *h_3 may disappear from a language and still linger in the lengths and timbres of that language's vowels, but *h_1 will leave its subtle trace in vowel length only. Were a reader with a particularly acute sensitivity to vowel color to study the vocalic system of the Indo-European languages, he might well catch a glimpse of *h_2 or *h_3 reflected in the vowels beside which they once stood. But the neutral laryngeal, *h_1, would be much more likely to escape his notice.

[337] Fredrik Otto Lindeman, *Introduction to 'Laryngeal Theory'*, 2nd ed., Innsbruck: Institut für Sprachwissenschaft der Universität Innsbruck, 1997. The actual sound qualities of all the laryngeals remains much disputed, but *h_1 is generally hypothesized to have been a glottal stop [ʔ] or, possibly, an [h]. One might be inclined to argue, therefore, that Saussure would have been more apt to miss this laryngeal because its sound is absent from the soundscape of his native language (it is generally accepted that Modern French features neither [ʔ] nor [h], disputes concerning the *h aspiré* aside). There is little evidence to suggest that Saussure was less capable of studying sounds absent from Modern French, however (and a great deal of evidence to the contrary). It is also worth pointing out that the conjectured pronunciations of *h_2 and *h_3 can scarcely be cited as evidence that these symbols correspond to sounds realized in Modern French.

ENVOI

In one of his last publications, *The Sound Shape of Language* (1979), Roman Jakobson makes a passing reference to the research of "Saussure's colleague, the Genevan psychologist Edouard Claparède."[338] The reference appears in the context of a discussion of "sound symbolism": linguistic instances in which a particular linguistic sound (typically a phoneme) seems to be intrinsically bound to a particular meaning (typically a quality, such as a color). In his effort to discern the nature of these conjunctions through various attestations in different languages, Jakobson notes the recurring connection between colors and vowels, citing Claparède's observation that "the capacity for comparison between colors and speech sounds seems to exist in each individual in at least an elementary stage."[339] Jakobson's bibliography links the reference back to Claparède's short article "Sur l'audition colorée" (1900)—a piece that, like the radio broadcast Mireille Cifali would come across a few years later, is devoted to defending the integrity of the subjects reporting synesthetic sensations.[340] As Claparède participated in but a single study of such sensations, the research to which Jakobson refers can be none other than Théodore Flournoy's 1893 *Phénomènes de synopsie*.

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[338] Roman Jakobson and Linda R. Waugh, *The Sound Shape of Language*, The Hague: de Gruyter, [1979] 1987, p. 197.
[339] Jakobson and Waugh, *Sound Shape*, p. 197.
[340] Édouard Claparède, "Sur l'audition colorée," *Revue philosophique de la France et de l'Étranger*, Vol. 49 (1900), pp. 515-7. Claparède's article is a response to M. Daubresse's "L'audition colorée," published in the March issue of the same journal (*Revue philosophique*, Vol. 49 [1900], pp. 300-5). Daubresse expresses the opinion that the public cannot be expected to offer reliable reports of *audition colorée* because "[o]u ils écoutent inattentivement ce qu'on leur demande, ne le comprennent point et restent sans réponse, leur esprit étant occupé ailleurs ; ou ils établissent entre les faits des relations fausses, hétéroclites et ils nous proposent comme preuves à l'appui, ce que leur imagination leur suggère, plutôt que ce qu'ils ont vraiment observé" (p. 301).

At the time of writing, of course, Jakobson had no means of knowing that Ferdinand de Saussure numbered among the subjects on whom Claparède's conclusion was based. As it turned out, Jakobson never would know. The towering figure of structuralist linguistics passed away in the summer of 1982, just months before Cifali re-published Saussure's newly attributed "Réponse." What Saussure's most prominent intellectual heir would have made of the vowel-color text, therefore, must remain a matter of speculation.

It seems safe to say, however, that Jakobson would have taken great interest in Saussure's observations on the colors of vowels. For Jakobson himself maintained throughout his scientific career that there existed "a phenomenal connection between different sensory modes, in particular between the visual and auditory experience."[341] Furthermore, he held that this connection furnished the very condition of possibility for sound symbolism, one of the hallmarks of poetic art. Poetry is not the exclusive domain of sound symbolism in Jakobson's account, to be sure, but it is "a province where the internal nexus between sound and meaning changes from latent to patent and manifests itself most intensely."[342]

The position finds its most lucid articulation in "Linguistics and Poetics," a lecture Jakobson delivered at Indiana University in the spring of 1958. Here, after investigating several instances of sound symbolism in poetry, he offers an explicit definition of the phenomenon:

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[341] Roman Jakobson, "Linguistics and Poetics" (1958), rpt. in *Selected Writings*, Vol. III, ed. Stephen Rudy, The Hague: Mouton, 1981, p. 44.
[342] Jakobson, "Linguistics and Poetics," p. 44.

> Sound symbolism is an undeniably objective relation founded on a phenomenal connection between different sensory modes, in particular between the visual and auditory experience. If the results of research in this area have sometimes been vague or controversial, it is primarily due to an insufficient care for the methods of psychological and/or linguistic inquiry. Particularly from the linguistic point of view the picture has often been distorted by lack of attention to the phonological aspect of speech sounds or by inevitably vain operations with complex phonemic units instead of with their ultimate components. But when, on testing, for example, such phonemic oppositions as grave versus acute we ask whether /i/ or /u/ is darker, some of the subjects may respond that this question makes no sense to them, but hardly one will state that /i/ is the darker of the two.[343]

The condition of possibility for sound symbolism is a "phenomenal connection between different sensory modes." As these "sensory modes" belong to the linguistic subject, the connection is entirely "subjective" in nature: it takes place within, and by means of, the human being. Jakobson's contention that "[s]ound symbolism is an undeniably objective relation," therefore, opposes the term "objective" not to "subjective," as is commonly thought, but to "subject-specific." His claim is that phenomenal connections between different sensory modes, such as one sees in the common perception that /u/ is darker than /i/, possess universal or near-universal subjective validity. Viewed from the proper vantage point, the connections are basically the same across all subjects.

In Jakobson's account, this phenomenal connection exists primarily between visual perceptions and the minimal units of language, aurally conceived—or, more precisely, their "ultimate components." These components are the phonetic qualities of speech sounds: the degree of oral aperture required for the production of a particular vowel, for example (often referred to in terms of an "open/closed" opposition), or the passage of air through the nose required for the production of "nasal" vowels (as in the French *chien*). The example Jakobson offers is, precisely, Stéphane Mallarmé's: that the "grave" vowel /u/ (*jour*) is "darker" than the

[343] Jakobson, "Linguistics and Poetics," p. 44.

"acute" vowel /i/ (*nuit*). This connection between sound qualities and visual perceptions provides the basis for linguistic expectation: for a collective intuition among speaking beings that a particular sound would be more fitting to one particular circumstance than another. Thus, while "[i]n referential language the connection between *signans* and *signatum* is overwhelmingly based on their codified contiguity, which is often confusingly labeled 'arbitrariness of the verbal sign'," Jakobson explains, the relationship between *signans* and *signatum* in poetry is not strictly one of convention.[344] In poetry, one perceives the possibility of a fittingness between sound and sense, a fittingness that derives from latent synesthetic conjunctions by which the minimal units of language are associated with visual qualities.

But whence might such universal synesthetic conjunctions between sound and sense derive? Neither the chapter on "Synesthesia" in *The Sound Shape of Language* nor the discussion of sound symbolism in the 1958 lecture offers any explanation as to why speakers of all languages would intuitively sense /u/ to be darker than /i/. A hurried reader of these texts might well conclude that Jakobson's conviction of this universal intuition is based solely on incomplete empirical data that, by his own account, is plagued by "insufficient care for the methods of psychological and/or linguistic inquiry."

Such a conclusion, however, would be hasty indeed, as Jakobson lays out the basis for this conviction in considerable detail in a much earlier text (albeit one that might not initially appear to have much bearing on questions of poetry). During his wartime exile in the Nordic countries between 1939 and 1941, Jakobson undertook a study of child language and aphasia, which he published in German under the title *Kindersprache, Aphasie und allgemeine*

[344] Jakobson, "Linguistics and Poetics," p. 44.

Lautgesetze (1941).[345] The text bears the considerable distinction of being the first to articulate the basic series of oppositions by which infants acquire the sounds of language, as well as the sequence of losses by which aphasiacs lose them. Rather than consider the imperfect speech of the child and the aphasiac as falling outside the realm of linguistics, as his predecessors had done, Jakobson contended that these inchoate utterances might provide privileged insight into the processes underlying normal human speech. His argument may be easily summarized.

Although each language in the world possesses its own distinctive set of sounds, the basic oppositions underlying them all bear striking resemblances. The first opposition to emerge in all infants learning to speak, Jakobson contended, is an opposition between sounds that severely constrict the passage of air and sounds that require it: what we might generally refer to as the opposition between consonants and vowels. One might also understand the distinction "from the motor point of view" in terms of aperture: the degree to which one opens one's mouth. Hence some variation of [a] is always the first vowel to appear, in opposition to the labial stop [m], as this difference more or less represents the largest motor opposition available to the human speech apparatus.[346] The first inter-consonantal opposition to emerge will oppose a nasal stop (e.g., [m], [n]), to an oral one (e.g. [p], [t]), and the oppositions will progress with increasing refinement until the full soundscape of a particular language has been established.

Within the vocalic sounds, the fundamental series of oppositions common to all languages involves only two steps. First, the child will oppose a wide vowel to a narrow one (i.e., oppose [a] to [i], enabling babbling strings of *papa-pipi*); the child will then split the narrow

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[345] Roman Jakobson, *Kindersprache, Aphasie und allgemeine Lautgesetze*, Uppsala: Språkvetenskapliga Sällskapets i Uppsala Förhandlingar, 1941; rpt. in Jakobson, *Selected Writings* Vol. I, The Hague: Mouton, 1962 (henceforth *SW* I); trans. Allen Keiler, *Child Language, Aphasia, and Phonological Universals*, The Hague: Mouton, 1968.
[346] Jakobson, *SW* I, p. 375; Keiler, p. 69.

vowel into a palatal and a velar (expanding the possibilities of babble beyond *papa* and *pipi* to include *pupu*).[347] These two processes, Jakobson concludes, lead to "a system of three vowels, which is the minimal vocalic system presented by the languages of the world."[348]



A few pages later, this "minimal vocalic system" proves integral to Jakobson's consideration of the "Agreements between the Systems of Sound and Color." Turning to "the penetrating analysis" of the German philosopher and psychologist Carl Stumpf, Jakobson considers Stumpf's proposition that to this basic vowel triangle there correspond "two psychophysical processes — the U - I process, which is connected to the brightness (*Helligkeit*) of sound sensations, and the A process, which determines their degree of chromatism (*Farbigkeit*)."[349]

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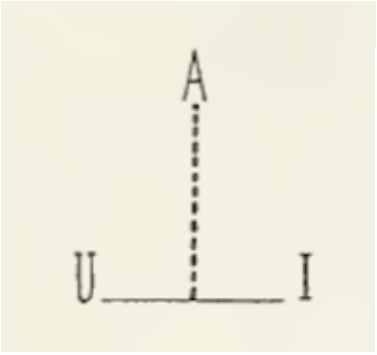
[347] "Die folgende Etappe des kindlichen Vokalismus bringt entweder eine Spaltung des engen Vokals in einen palatalen und velaren, also beispielsweise *papa-pipi-pupu*." The second step can, alternatively, involve "a third more central degree of opening, *e.g.*, *papa-pipi-pepe*" ("einen dritten, mittleren Öffnungsgrad, z.B. *papa-pipi-pepe*" (*SW* I, p. 358; Keiler, p. 49).

[348] "Jeder dieser beiden Prozesse führt zu einem System von drei Vokalen, und das ist zugleich der minimale Vokalismus, welchen die lebendigen Sprachen der Welt aufweisen" (*SW* I, p. 358; Keiler, p. 49).

[349] "nach der scharfsinnigen Analyse von Stumpf, zwei psychophysische Prozesse — der „U-I Prozess", der sich auf die Helligkeit und Dunkelheit der Lautempfindungen bezieht, und der „A-Prozess", der ihre Farbigkeitsgrad bestimmt" (*SW* I, p. 379; Keiler, p. 74). The reader will remember Carl Stumpf as Hermann von Helmholtz's eloquent obituarist (see Chapter 1, §3 "Klangfarbe"); Jakobson refers to Chapter 13 of Stumpf's study *Die Sprachlaute: experimentell-phonetische Untersuchungen nebst einem Anhang über Instrumentalklänge*, Berlin: Springer, 1926, pp. 326-48.



Farbigkeit, "chromatism," charts the axis on which the first vocalic distinction (*papa-pipi*) is based (what Jakobson refers to as the "wide-narrow distinction"); *Helligkeit*, "brightness," charts the axis established by the second vocalic distinction (*pipi-pupu*). Noting the pronounced visual metaphors parading as linguistic terms ("brightness," "chromatism"), Jakobson is led to question the strict metaphoricity of the technical jargon. "It is possible to stay within the limits of phonological phenomena concerning the inquiry into sound qualities," he writes,

> and to view the terms light-dark and chromatic-achromatic, as well as variegated or hueless colours, as simple metaphors and to replace them eventually with non-metaphorical terms; but the problem of the phenomenal similarity between sound and colour is becoming more and more evident. Obviously, both series of qualities, lightness-darkness and chromatic-achromatic, are common to sound and visual sensations, and the structure of sound and colour systems shows marked agreements.[350]

By way of illustrating how the apparently "simple metaphors" might in fact indicate a "phenomenal similarity between sound and colour," Jakobson points out that "cases of pronounced coloured hearing, especially in children or retained from childhood, […] show the

[350] "Man kann zwar bei der Untersuchung der Lautqualitäten in den Grenzen der lautlichen Phänomene verbleiben und die Bezeichnungen Hell-Dunkel, Farbig-Farblos, sowie andererseits getönte oder tonlose Farbe, als einfache Metaphern betrachten und sie eventuell durch bildlose Termini ersetzen, aber das Problem der phänomenalen Ähnlichkeit zwischen Laut und Farbe wird immer greifbarer; offensichtlich sind die beiden Qualitätenreihen „Dunkelheit-Helligkeit" und „Farbigkeit-Farblosigkeit" den Lauten und Gesichtsempfindungen gemeinsam, und der Bau des Laut- und Farbensystems weist markante Übereinstimmungen auf" (*SW* I, p. 386; Keiler, p. 82).

close connection of the vowels *o* and *u* with the specifically dark colours, and of *e* and *i*, on the other hand, with specifically light colours."[351] Such individuals also demonstrate a "distinct inclination […] to connect the more chromatic vowels with the variegated colours, especially *a* with red."[352] For synesthetic individuals who hear colors in vowels, Jakobson thus suggests, the axes of vowel brightness and chromatism simultaneously chart out the relations of both phonic and visual phenomena.

In Jakobson's account, then, the linguistic terms "brightness" and "chomatism" are not "simple metaphors" that might be easily replaced with non-metaphorical terms, as the metaphors signal the phenomenal connection between speech sounds' phonetic qualities and the visual brightness and chromatism experienced by synesthetes. This connection is crucial not only for the study of synesthesia, Jakobson contends, but also for the study of child language, and, consequently, language writ large. Suspecting colored hearing to be a vestigial condition, common to all in the last stages of infancy and surviving with varying degrees of strength into adulthood, Jakobson cautiously suggests that its structures might well be integral to the acquisition of speech, our mastery of maximal phonic oppositions aided and abetted by the relationships we perceive between visual shades and hues. As prattling children striving to produce the sounds of language, we might well memorize by means of association, mapping out

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[351] "Auch die Fälle des ausgeprägten, bes. kindlichen oder aus der Kindheit überlieferten Farbenhörens […] zeigen den engen Zusammenhang der Vokale *o* und *u* mit den spezifisch dunklen, *e* und *i* dagegen mit den spezifisch hellen Farben" (*SW* I, p. 386; Keiler, p. 82).

[352] "und ebenfalls eine deutliche Neigung, die farbigeren Vokale mit den bunteren Farben, insbesondere *a* mit Rot zu verknüpfen" (*SW* I, pp. 386-7; Keiler, p. 82). For a sense of where this perspectival shift has led in more recent research, see, for example, Lawrence E. Marks, "On Colored-Hearing Synesthesia: Cross-Modal Translations of Sensory Dimensions," *Psychological Bulletin* 82.3 (1975): 303-331; V.S. Ramachandran and E.M. Hubbard's "Synaesthesia: A window into perception, thought and language." *Journal of Consciousness Studies* 8.12 (2001): 3–34; and Blasi, Damián E. et al., "Sound–meaning Association Biases Evidenced across Thousands of Languages," *Proceedings of the National Academy of Sciences of the United States of America* 113.39 (2016): 10818-23. PMC. Web. 22 July 2017.

new motor oppositions within pre-existing visual scales. Our intuitive notion of *jour* as 'dark' and *nuit* as 'light,' then, would derive from a synesthetic vowel-color correspondence that was once vital to us, but which, ceasing to be necessary as we mastered the sounds of a mother tongue, receded all but irretrievably into oblivion. Such a correspondence would make itself felt only when suddenly realized in an utterance perfectly aligning its elements—or misaligning them so perversely as to make us realize that we had a notion, however dim, of what "perfection" might be.

WORKS CITED

Abercrombie, David. "What is a 'letter'?" *Lingua* 2 (1949): 54-63.

Agamben, Giorgio. "Disappropriata maniera." Preface to Giorgio Caproni, *Res amissa*, Milan: Garzanti, 1991, pp. 7-26. Trans. Daniel Heller-Roazen, "Expropriated Manner," *The End of the Poem*, Stanford: Stanford UP, 1999. pp. 87-101.

Agamben, Giorgio. "La fine del poema." *Categorie italiane: Studi di poetica e di letteratura*. Rome: Laterza, [1996] 2011. pp. 138-44. Trans. Daniel Heller-Roazen, "The End of the Poem." *The End of the Poem*. Stanford: Stanford UP, 1999. pp. 109-15.

Aubertin, Charles. *La Versification française et ses nouveaux théoriciens*. Paris: Belin, 1898.

Bailhache, Patrice. *Une histoire de l'acoustique musicale*. Paris: CNRS, 2001.

de Banville, Théodore. *Nouvelles Odes funambulesques*. Paris: Lemerre, 1869.
_____. *Petite traité de poésie française*. Paris: Éditions d'aujourd'hui, [1872] 1978.

Baron-Cohen, Simon and John E. Harrison, *Synaesthesia*. Oxford: Blackwell, 1997.

Baudelaire, Charles. *Oeuvres complètes*. Ed. Claude Pichois. Paris: Gallimard, 1976.

Beattie, James. "An Essay on Poetry and Musick as they affect the mind" (1762). Rpt. in *The Works of James Beattie.* Philadelphia: Hopkins and Earle, 1809.

Benjamin, Walter. "Die Aufgabe des Übersetzers." Foreword to Charles Baudelaire, *Tableaux Parisiens.* Frankfurt-am-Main: Suhrkamp, [1923] 1963. pp. 7-24.

Benveniste, Émile. *Hittite et indo-européen*. Paris: Maisonneuve, 1962.
_____. "La nature du signe linguistique." *Problèmes de linguistique générale*. Vol. 1. Paris: Gallimard, 1966. pp. 49-56.

Bergeron, Katherine. *Voice Lessons: French Mélodie in the Belle Epoque*. New York and Oxford: Oxford University Press, 2009.

Bernadet, Arnaut. *Poétique de Verlaine*. Paris: Garnier, 2012.

Bienvenu, Jacques. "*Art poétique* de Verlaine : une réponse au traité de Banville." *Europe revue littéraire mensuelle* 936 (2007): 97-108.
_____. "Ce qu'on dit au poète à propos de Rimbaud et Banville." *La revue des ressources* (2009): <http://www.larevuedesressources.org/ce-qu-on-dit-au-poete-a-propos-de-rimbaud-et-banville,1355.html>.

Billy, Dominique. “La rime androgyne: D’une métaphore métrique chez Verlaine.” *Le vers français : Histoire, théorie, esthétique*. Ed. Michel Murat. Paris: Champion, 2000. pp. 297-347.

Blanc, Charles. *Grammaire des arts du dessin*, Paris: Renouard, 1883.

Blanchot, Maurice. *L’Espace littéraire*. Paris: Gallimard, 1955.

Blasi, Damián E. et al., “Sound–meaning Association Biases Evidenced across Thousands of Languages,” *Proceedings of the National Academy of Sciences of the United States of America* 113.39 (2016): 10818–10823. PMC. Web. 22 July 2017.

Bleuler, Eugen and Karl Lehmann. *Zwangsmässige Lichtempfindungen durch Schall und verwandte Ersheinungen auf dem Gebiete der anderen Sinnesempfindungen*, Leipzig: Fues Verlag, 1881.

Bloch, R. Howard. *One Toss of the Dice: The Incredible Story of How a Poem Made Us Modern*. New York: Liveright, 2016.

Bobillot, Jean-Pierre. “De l’anti-nombre au quasi-mètre et au non-mètre : ‘l’hendécasyllabe’ chez Verlaine.” *Revue Verlaine* 2 (1994): 66-86.

Boethius. *Fundamentals of Music*. Trans. Calvin M. Bower. New Haven: Yale University Press, 1966.

Brain, Robert Michael. *The Pulse of Modernism: Physiological Aesthetics in Fin-de-Siècle Europe*. Seattle: University of Washington Press, 2015.

Brang, David and V. S. Ramachandran. “Survival of the Synesthesia Gene: Why Do People Hear Colors and Taste Words?” *PLoS Biology* 9.11 (2011): e1001205. PMC. Web. 19 May 2017.

Brémond, Henri. *La poésie pure*. Paris: Grasset, 1926.

Callus, Ivan. “A Chronological and Annotated Bibliography of Works Referring to Ferdinand de Saussure’s Anagram Notebooks.” *Cahiers Ferdinand de Saussure* 55 (2002): 269-95.

Chervel, André. “Le débat sur l’arbitraire du signe au XIXe siècle.” *Romantisme* 25-6 (1979): 3-33.

Chevreul, M.E. *De la loi du contraste simultané des couleurs,* Paris: Gauthier-Villars, 1889.

Chomsky, Noam. *Language and Mind*. Cambridge: CUP, 2006.

Chouillet-Roche, Anne-Marie. “Le Clavecin oculaire du P. Castel.” *Dix-huitième Siècle* 8.1 (1976): 141-166.

Cifali, Mireille. “Présentation.” *Le Bloc-Notes de la psychanalyse* 3 (1983): 133-4.

Claparède, Édouard. “Sur l’audition colorée.” *Revue philosophique de la France et de l’Étranger* 49 (1900): 515-7.

de Cornulier, Benoît. “La rime mal assagie et la musique populaire de l'*Art poétique* de Verlaine.” *Revue Verlaine* 10 (2007): 111-120.

_____. *Théorie du vers : Rimbaud, Verlaine, Mallarmé*. Paris: Seuil, 1982.

Cytowic, Richard. “Synesthesia: Phenomenology and Neuropsychology: A Review of Current Knowledge.” *Psyche,* 2.10 (July 1995): <http://psyche.cs.monash.edu.au/v2/psyche-2-10-cytowic.html>.
_____, *Synesthesia: A Union of the Senses*, Cambridge: MIT Press, 1989.

Dann, Kevin. *Bright Colors Falsely Seen: Synaesthesia and the Search for Transcendental Knowledge*. New Haven: Yale UP, 1998.

Daubresse, M. “L’audition colorée.” *Revue philosophique de la France et de l’Étranger* 49 (1900): 300-5.

Davis, Boyd and Ferdinand de Saussure. “Essai pour réduire les mots du grec, du latin & de l'allemand a un petit nombre de racines.” *Cahiers Ferdinand de Saussure* 32 (1978): 73-101.

Deguy, Michel. “La folie de Saussure.” *Critique* 25 (1969): 20-6.

Donders, F.C. “Ueber die Natur der Vocale.” *Archiv für die Holländischen Beiträge für Natur- und Heilkunde* Vol. I (1857): 157-62.

Duchez, Marie-Elisabeth. “Des neumes à la portée: Elaboration et organisation rationnelles de la discontinuité musicale et de sa représentation graphique, de la formule mélodique à l’échelle monocordale.” *Canadian University Music Review* 4 (1983): 22-65.

Étiemble, René. *Le sonnet des voyelles : De l’audition colorée à la vision érotique*. Paris: Gallimard, 1968.

Euler, Leonhard. “Eclaircissemens plus détaillés sur la génération et la propagation du son et sur la formation de l’echo.” *Mémoires de l’académie des sciences de Berlin* 21 (1767): 540-68.

Fehr, Johannes. *Saussure : Entre linguistique et sémiologie*. Trans. Pierre Caussat. Paris : Presses Universitaires de France, [1997] 2000.

Flörke, Heinrich Gustav. "Nachtrag zu dem Aufsatze: Die Tonleiter der Vokale." *Neue Berlinische Monatschrift* 10 (February 1803): 343-71.
_____. "Tonleiter der Vokale," *Neue Berlinische Monatschrift* 10 (Sept. 1803): 161-84.

Flournoy, Théodore. *Des Indes à la planète Mars, étude sur un cas de somnambulisme avec glossolalie*, Paris: Alcan and Geneva: Eggimann, 1900.
_____. *Des phénomènes de synopsie*. Paris and Geneva: Alcan and Eggiman, 1893.

de Fouquières, L. Becq, *Traité général de versification française,* Paris: Charpentier, 1879.

France, Anatole. "Courrier de Paris." *L'Univers illustré* 1914 (28 Nov 1891): 574-7.

French, Patrice. "Toward an Explanation of Phonetic Symbolism." *Word* 28.3 (1977): 305-22.

Fromentel, Henry de, *Les Synalgies et les synesthésies*, Paris: Masson, 1888.

Gage, John. *Colour and Culture*. London: Thames and Hudson, 1993.
_____. *Color and Meaning*. Berkeley: University of California Press, 1999.

Gautier, Théophile. "Le club des hachichins." *Revue des deux mondes* (February 1846): 520-35.

Genette, Gérard. "Le jour, la nuit." *Cahiers de l'Association internationale des études francaises* 20 (1968): 149-65.
_____. *Mimologiques*. Paris: Seuil, 1976.

Ghil, René. *Traité du verbe*. Paris: Giraud, 1886.

von Goethe, Johann Wolfgang. *Zur Farbenlehre*. Tübingen: Cotta'sche, 1810.

Grimaud, Michel. "'Art poétique' de Verlaine, ou de la rhétorique du double jeu." *Romance notes* XX:I (Fall 1979): 195-201.

Grimm, Jacob and Wilhelm. *Deutsches Wörterbuch.* Leipzig: S. Hirzel, 1854-1960.

von Helmholtz, Hermann. *Die Lehre von den Tonempfindungen als Physiologische Grundlage für die Theorie der Musik*. Braunschweig: Vieweg & Sohn, [1863] 1913. Trans. Alexander J. Ellis. *On the Sensations of Tone as a Physiological Basis for the Theory of Music*. New York: Dover, [1870] 1954.
_____. "Die Physiologischen ursachen der musikalischen Harmonie," *Populäre wissenschaftliche Vorträge*. Vol. 1. Braunschweig: Vieweg und Sohn, 1865. pp.

55-94. Trans. Alexander Ellis, "On the Physiological Causes of Harmony in Music." *Popular Lectures on Scientific Subjects*. Vol 1. London: Routledge/Thoemmes Press, [1895] 1996, pp. 61-106.
_____. *Handbuch der Physiologischen Optik*. Vol. II, 3rd Ed. Hamburg and Leipzig: Leopold Voss, [1867] 1911. English ed. James P.C. Southall, *Treatise on Physiological Optics* Vol. II. Menasha, Wisconsin: George Banta, 1924.
_____. "Thatsachen in der Wahrnehmung" (1878). Rpt. in *Vorträge und Reden*. Vol. II. Brauschweig: Vieweg und Sohn, 1884. Trans. Malcolm F. Lowe, "Facts in Perception," in *Epistemological Writings* ed. Robert S. Cohen and Yehuda Elkana. Boston: D. Reidel Publishing Co., 1977.
_____. "Ueber die arabisch-persische Tonleiter." *Verhandlungen des naturhistorisch-medizinischen Vereins zu Heidelberg*, 2 (1862), pp. 216-7.
_____. "Ueber die Klangfarbe der Vocale." *Poggendorffs Annalen*. Vol. cviii (1859): 280-90.

Helmont, F.M. *The Alphabet of Nature: A Short Sketch of the Truly Natural Hebrew Alphabet* [*Alphabeti veri naturalis hebraici brevissima delineatio*, 1667]. Trans. Allison Coudert and Taylor Corse. Boston: Brill, 2007.

Hellwag, Christoph Friedrich. *Dissertatio de formatione loquelae*. Heilbronn: Verlag von Gebr. Henninger, [1781] 1886.

The Holy Bible, King James Version. King James Bible Online: www.kingjamesbibleonline.org.

Huysmans, J.K. *À rebours*. Paris: Charpentier, 1884.

Jakobson, Roman. *Kindersprache, Aphasie und allgemeine Lautgesetze*. Uppsala: Språkvetenskapliga Sällskapets i Uppsala Förhandlingar, 1941. Rpt. in Jakobson, *Selected Writings*. Vol. I. The Hague: Mouton, 1962. pp. 328-401. Trans. Allen Keiler, *Child Language, Aphasia, and Phonological Universals*, The Hague: Mouton, 1968.
_____. "Linguistics and Poetics." *Selected Writings*. Vol. III. Ed. Stephen Rudy. The Hague: Mouton, 1981, pp. 18-51.
_____. "Saussure's Unpublished Reflections on Phonemes." *Cahiers Ferdinand de Saussure* 26 (1969): 5-14. Rpt. in Roman Jakobson. *Selected Writings*. Vol. I. The Hague: Mouton, 1962. pp. 743-50.

Jakobson, Roman, and Linda R. Waugh. *The Sound Shape of Language*. The Hague: de Gruyter, [1979] 1987.

Jenny, Laurent. *La fin de l'intériorité*. Paris: Presses universitaires de France, 2002.

Jewanski, Jörg. *Ist C = Rot? Eine Kultur- und Wissenschaftsgeschichte zum Problem der wechselseitigen Beziehung zwischen Ton und Farbe Von Aristoteles bis Goethe*. Berlin: Studio Verlag, 1996.

Jewanski, Jörg, Sean A. Day, and Jamie Ward. "A Colorful Albino: The First Documented Case of Synaesthesia, by Georg Tobias Ludwig Sachs in 1812." *Journal of the History of the Neurosciences*,18.3 (2009): 293-303.

Jewanski, Jörg, Julia Simner, Sean A. Day, and Jamie Ward. "The Development of a Scientific Understanding of Synesthesia from Early Case Studies (1849–1873)," *Journal of the History of the Neurosciences: Basic and Clinical Perspectives* 20.4 (2011): 284-305.

Joseph, John. *Saussure*. Oxford: Oxford University Press, 2012.
_____. "He was an Englishman." *Times Literary Supplement*. 6 Nov. 2007: 14-5.
_____. "« La teinte de tous les ciels » : divergeance et nuance dans la conception saussurienne du changement linguistique." *Cahiers Ferdinand de Saussure* 63 (2010): 145-58.
_____. "Two Mysteries of Saussure's Early Years Resolved." *Historia Linguistica* 34 (2007): 155-66.

Kahn, Gustave. "Arthur Rimbaud." *La revue blanche* 16 (1898): 592-601.
_____. "Préface [sur le vers libre]." *Premiers poèmes,* Paris: Mercure de France, 1897, pp. 3-38.
_____. *Le Vers libre*. Paris: Figuière & Cie, 1912.

Kandinsky, Wassily. *Über das Geistige in der Kunst*. Bern: Benteli, 2004.

Katz, Joshua T. "Gods and Vowels." *Poetic Language and Religion in Greece and Rome*. Ed. J. Virgilio García and Angel Ruiz. Newcastle upon Tyne: Cambridge Scholars Publishing, 2013, pp. 2-28.
_____. "Saussure's *anaphonie* : Sounds Asunder." *Synaesthesia and the Ancient Senses*. Ed. Shane Butler and Alex Purves. Durham: Acumen, 2013, pp. 167-84.

von Kempelen, Wolfgang. *Mechanismus der menschlichen Sprache*. Wien: J.B. Degen, 1791.

Kratzenstein, C.G. *Testamen Coronatum de Voce*. St. Petersburg: Imperial Academy, 1780.

Krohn, William O. "Pseudo-Chromesthesia, or the Association of Colors with Words, Letters and Sounds." *The American Journal of Psychology* 5.1 (1892): 20-41.

Kuryłowicz, Jerzy. "Ə indoeuropéen et ḫ hittite" (1926). *Symbolae grammaticae in honorem Ioannis Rozwadowski*. Ed. Witold Taszycki and Witold Jan Doroszewski. Vol. 1. Krakow: Jagiellonian University Press, 1927. pp. 95-104.

Lacoue-Labarthe, Philippe. *Musica Ficta : Figures de Wagner*. Paris: Christian Bourgois, 1991.

Lefrère, Jean-Jacques. *Arthur Rimbaud*. Paris: Fayard, 2001.

Le Roy, Georges. *Grammaire de la diction française*. Paris: Delaplane, 1912.

Lepschy, Giulio. "Saussure e gli spiriti," *Studi saussuriani per Robert Godel*. Ed. René Amacker, Tullio De Mauro, and Luis J. Prieto. Bologna: Il Mulino, 1974, pp. 181-200.

Lévi-Strauss, Claude. "Des sons et des couleurs," *Regarde, écouter, lire*, Paris: Plon, 1993, pp. 127-37.

Levy, Kenneth. "On the Origin of Neumes." *Early Music History* 7 (1987): 59-90.

Liddell and Scott. *An Intermediate Greek-English Lexicon*. Oxford: Clarendon Press, 1889. Web. <http://www.perseus.tufts.edu/>.

Littré, Émile, ed. *Dictionnaire de la langue française*. Vol. 6. Versailles: Encyclopedia Britannica, 1994.

Lloyd, Rosemary. *Mallarmé: The Poet and His Circle*. Ithaca: Cornell UP, 1999.

Locke, John. *Essay Concerning Human Understanding*. London: Baffet, 1690.

Lyotard, François. *L'inhumain: causeries sur le temps.* Paris: Galilée, 1988.

Mallarmé, Stéphane. *Oeuvres complètes*. Ed. Bertrand Marchal. Vols. I and II. Paris: Gallimard, 1998 and 2003.
_____. *Correspondance*. Ed. Henri Mondor and Lloyd James Austin. Vol. 6. Paris: Gallimard, 1981.
_____. *Divagations*. Trans. Barbara Johnson. Cambridge: Harvard University Press, 2007.

Marchal, Bertrand. *Le Symbolisme*. Paris: Armand Colin, 2011.

Marks, Lawrence E. "On Colored-Hearing Synesthesia: Cross-Modal Translations of Sensory Dimensions." *Psychological Bulletin* 82.3 (1975): 303-331.
_____. "Synesthetic perception and poetic metaphor." *Journal of Experimental Psychology: Human Perception and Performance* 8 (1982): 15-23.
_____. *The Unity of the Senses: Interrelations among the* Modalities. New York: Academic Press, 1978.

Mazzeo, Marco. *Storia naturale sinestesia : Dalla questione Molyneux a Jakobson*, Rome: Quodlibet, 2005.
_____. "Les voyelles colorées: Saussure et la synesthésie." Trans. Livia Scheller. *Cahiers Ferdinand de Saussure* 57 (2004): 129-43.

McKevitt, Paul, Sean Ó Nualláin, and Conn Mulvihill, eds. *Language, Vision and Music*. Amsterdam: John Benjamins, 1999.

Meulders, Michel. *Helmholtz : Des lumières aux neurosciences.* Paris: Odile Jacob, 2001.

Milner, Jean-Claude. *L'amour de la langue*. Paris: Verdier [1978] 2009.
_____. *Le périple structural : Figures et paradigme*, Paris: Verdier, [2002] 2008.
_____. *Mallarmé au tombeau*. Paris: Verdier, 1999.
_____. "Forme et structure ou le conte des faux jumeaux." *Les Temps Modernes* 676 (2013): 120-43.
_____. "Réflexions sur le fonctionnement du vers français." *Ordres et raisons de langue*. Paris: Seuil, 1978, pp. 283-301.
_____. "Mallarmé Perchance." *Hyperion: On the Future of Aesthetics* IX.3 (2015): 87-110.
_____. "Les constellations révélatrices." *Elucidations* 8-9 (Winter 2003-4), pp. 3-**7.**

Morice, Charles ("Karl Mohr"). "Boileau Verlaine." *La nouvelle rive gauche* I.4 (1882): 3.

Murat, Michel. *L'art de Rimbaud*. Revised and augmented edition. Paris: Corti, [2002] 2013.
_____. "Le vers libre rimé." *Poétique de la Rime*. Paris: Champion, 2005. pp. 381-411.
_____. *Le vers libre*. Paris: Champion, 2008.

Murphy, Steve. "Verlaine parnassien : Définitions, filiations, nuances." In Arthur Rimbaud, *Poèmes saturniens : Édition critique.* Paris: Champion, 2008. pp. 203-56.

Müller, Johannes. *Handbuch der Physiologie des Menschen*. Coblenz: J. Hölscher, 1837.

Nabokov, Vladimir. *Speak, Memory*. Harmondsworth: Penguin, 1969.

Newton, Isaac. *Opticks: or, a Treatise of the Reflexions, Refractions, Inflexions and Colours of Light*. London: Royal Society, 1704.

Ohm, Georg Simon. "Ueber die Definition des Tons, nebst daran geknüpfter Theorie der Sirene und ähnlicher tonbildener Vorrichtungen." *Poggendorffs Annalen der Physik*. LIX (1843): 513-55.
_____. "Noch ein Paar Worte über die Definition des Tons." *Poggendorffs Annalen der Physik*. LXII (1844): 1-17.

Oresme, Nicole. *Tractatus de configurationibus qualitatum et motuum*, II.xviii. Trans. Marshall Clagett. Madison: University of Wisconsin Press, 1968.

Oxford English Dictionary Online. Web. <http://www.oed.com>.

Parret, Herman. “Métaphysique saussurienne de la voix et de l’oreille dans les manuscrits de Genève et de Harvard.” *Ferdinand de Saussure*. Paris: L’Herne, 2003, pp. 62-78.

Petit, Daniel. “Le langage martien,” *LALIES* 35 (2015): 91-105.

Pictet, Adolphe. *Les origines indo-européennes, ou Les Aryas primitifs : essai de paléontologie linguisique*. Paris: Cherbuliez, 1859.

Plinius Secundus, Gaius. *Natural History* [*Naturalis Historia,* 77-9 AD]. Trans. John Bostock and H.T. Riley, London: Taylor and Francis, 1855; available online at http://www.perseus.tufts.edu/hopper/text?doc=urn:cts:latinLit:phi0978.phi001.perseus-eng1:35.11.

Popova, Yanna. “Image Schemas and Verbal Synaesthesia.” *From Perception to Meaning*. Berlin: de Gruyter, 2005, pp. 395-419.

Quicherat, Louis. *Petit traité de versification française*. 7th ed. Paris: Hachette, [1839] 1881.

Ramachandran, V.S. and E.M. Hubbard. “Synaesthesia: A window into perception, thought and language.” *Journal of Consciousness Studies* 8.12 (2001): 3–34.

Rameau, Jean-Philippe. *Traité de l’harmonie réduite à ses principes naturels*. Paris: Ballard, 1722.

Raynaud, Ernest. “Chronique littéraire.” *Le Décadent* 3.2 (January 1888): 8-10.

Reichard, Gladys, Roman Jakobson, and Elizabeth Werth. “Language and Synesthesia.” *Word* 5 (1949): 224-33.

Rey, Alain, ed. *Dictionnaire historique de la langue française*. Paris: Le Robert, 1993.

Reyher, Samuel. *Mathesis Mosaica, sive Loca Pentateuchi Mathematica Mathematicè explicata*. Kiel: Kilia Holsatorum, 1679.

Ribot, Théodule. *Psychologie des sentiments*. Paris: Alcan, 1896.

Ribot, Théodule and Léon Marillier. *Congrès International de psychologie physiologique*: *première session*. Paris: Bureau des revues, 1890.

Rimbaud, Arthur. *Oeuvres complètes*. Ed. André Guyaux and Aurélia Cervoni. Paris: Gallimard, 2009.
_____. *Oeuvres complètes facsimiles*. Ed. Steve Murphy. Paris: Champion 2002.
_____. *Illuminations.* Trans. John Ashbery. Manchester: Carcanet, 2011.

Roch, Eckhard. *Chroma-Color-Farbe: Ursprung und Funktion der Farbmetapher in der antiken Musiktheorie*. Mainz: Schott, 2001.

Rocque, Georges. "Les symbolistes et la couleur." *Revue de l'Art* 96 (1992): 70-6.

Roubaud, Jacques. *Le vieillesse d'alexandre*. Paris: Ramsay, 1978.

Rousseau, Jean-Jacques. *Oeuvres complètes de J. J Rousseau*. Vol. 7. Paris: Hachette, 1906.

Sachs, G.L.T. *Historiae naturalis duorum leucaetiopum: Auctoris ipsius et sororis eius.* PhD dissertation. Universität Erlangen. 1812.

Sacks, Oliver. *Musicophilia: Tales of Music and the Brain*, New York: Vintage, 2008.

Sauver, Joseph. *Collected Writings on Musical Acoustics*. Ed. Rudolf Rasch. Utrecht: Diapason Press, 1984.

de Saussure, Ferdinand. *Deuxième cours de linguistique générale (1908-9), d'après les cahiers d'Albert Riedlinger et Charles Patois*. Ed. Eisuke Komatsu with an English translation by George Wolf. Oxford and New York: Pergamon, 1997.
_____. *Cours de linguistique générale*. Ed. Rudolf Engler. Vol. 2, fascicle 4. Wiesbaden: Harrassowitz, 1974.
_____. *Cours de linguistique générale*. Ed. Tullio de Mauro, Paris: Payot, 1962.
_____. "Essai d'une distinction des différentes *a* indo-européens." *Mémoires de la société de linguistique de Paris.* Vol 3.5 (1878): 359-70.
_____. *Mémoire sur le système primitif des voyelles dans les langues indo-européennes*. Leipzig: Teubner, 1879.
_____. *Recueil des publications scientifiques de Ferdinand de Saussure*. Geneva: Société anonyme des éditions sonor, 1922.
_____. "Réponse à une enquête sur l'audition colorée." *Le Bloc-Notes de la psychanalyse* 3 (1983):137-9.

Savart, Félix. "Nouvelles recherches sur les vibrations de l'air." *Annales de chimie* XXIX (August 1825): 404-26.
_____. "Mémoire sur la voix humaine." *Annales de chimie* XXX (September 1825): 64-87.
_____. "Mémoire sur la voix des oiseaux." *Annales de chimie* XXXII (May-June 1826): 5-24.

Schmidhofer, August and Stefan Jena. *Klangfarbe : vergleichend-systematische und musikhistorische Perspektiven*. Frankfurt-am-Main: Lang, 2011.

Scott, Clive. *Vers Libre : The Emergence of Free Verse in France 1886-1914*. Oxford: Oxford University Press, 1990.

Seebeck, August. "Theorie des Mittönens." *Repertorium der Physik* 8 (1849): 60-4.

Segalen, Victor. "Les synesthésies et l'école symboliste." *Mercure de France* 42.4 (1902): 57-90.

Sieburth, Richard. "The Music of the Future," *A New History of French Literature*. Ed. Denis Hollier. Cambridge: Harvard University Press, 1989. pp. 789-798.

Starobinski, Jean. *Les mots sous les mots: Les anagrammes de Ferdinand de Saussure*. Paris: Gallimard, 1971.

Steege, Benjamin. *Helmholtz and the Modern Listener*. Cambridge: Cambridge University Press, 2012.

Stevens, Wallace. *Collected Poems*. New York: Knopf, 1955.

Straka, Georges. "Remarques sur les voyelles nasales, leur origine et leur évolution en français." *Revue de linguistique romane* 19 (1955): 245-74.

Stumpf, Carl. "Hermann von Helmholtz and the New Psychology." Trans. John Grier Hibben. *The Psychological Review* 2:1 (January 1895): 1-12.
_____. *Die Sprachlaute: experimentell-phonetische Untersuchungen nebst einem Anhang über Instrumentalklänge*. Berlin: Springer, 1926.
_____. *Tonpsychologie*. Leipzig: S. Hirzel, 1883-1890.

Suárez de Mendoza, Ferdinand. *L'audition colorée: étude sur les fausses sensations secondaires physiologiques et particulièrement sur les pseudo-sensations de couleurs associées aux perceptions objectives des sons*. Paris : Octave Doin, 1890.

Szabó, Árpád. *Anfänge der griechischen Mathematik*. Budapest: Akadémiai Kiadó, 1969.

Todorov, Tzvetan. "Le sens des sons." *Poétique* 11 (1972): 446-59.

Treitler, Leo. "The 'Unwritten' and 'Written Transmission' of Medieval Chant and the Start-Up of Musical Notation," *The Journal of Musicology*, Vol. 10.2 (Spring, 1992): 131-91.

Trésor de la langue française. Web. <http://www.le-tresor-de-la-langue.fr>.

Trésor de la langue française. Vol. 2. Paris: CNRS, 1973.

Tsur, Reuven. *What makes sound patterns expressive?* Durham: Duke University Press, 1992.

Verlaine, Paul Marie. *Oeuvres poétiques complètes*. Ed. Y.-G. Le Dantec with Jacques Borel. Paris: Gallimard, 1962.
_____. *Oeuvres en prose complètes*. Ed. Jacques Borel. Paris: Gallimard, 1972.

Vial, André. *Faits et significations*. Paris: Nizet 1973.

Wagner, Richard. "The Arts of Poetry and Tone in the Drama of the Future." *Opera and Drama*. Trans. William Ashton Ellis, 2nd Ed. London: Kegan Paul, Trench, Trubner & Co., 1900. pp. 123-88.

Weeden, Mark. *Hittite Logograms and Hittite Scholarship*. Wiesbaden: Harrassowitz, 2011.

Wheatstone, Charles. "Reed Organ-Pipes, Speaking Machines, etc." *The London And Westminster Review* (October 1837): 14-22.

Willis, Robert. "On the Vowel Sounds, and on Reed Organ-Pipes." *Transactions of the Cambridge Philosophical Society* 3 (1830): 231-68.

Wundt, Wilhelm Max. *Eléments de psychologie physiologique*. Trans. Elie Rouvier. Paris: Alcan, 1886.

Zissmann, Claude. "Rimbaud décadent." *Rimbaud 1891-1991*. Ed. André Guyaux. Paris: Champion, 1994. pp. 161-78.