“Rien de la tonalité usuelle”:
Edmond de Polignac and the Octatonic Scale in Nineteenth-Century France

SYLVIA KAHAN

It was in 1963, just over forty years ago, that composer and theorist Arthur Berger’s article “Problems of Pitch Organization in Stravinsky” was published in the journal Perspectives of New Music. This landmark scholarly article reveals a fundamental organizational device underlying the pitch structure of extensive passages in works such as Petrushka, Le sacre du printemps, and Les noces: a series of eight alternating half steps and whole steps, which Berger dubs, for the first time, “the octatonic scale.” Berger identifies a number of characteristic features of the scale: its symmetrical structure, its bisection at the tritone, its emphasis on minor-third relations, its construction from two diminished-seventh chords a semitone apart, and interaction with diatonic elements.1

Since 1963, scholars have continued to shed light on the functional and formal uses of the octatonic scale. Pieter van den Toorn demonstrates the pervasive use of the octatonic col-

collection in over forty of Stravinsky’s works; Richard Taruskin systematically traces the genesis of the scale back first to Schubert, then to Liszt, and finally to a large number of Russian composers, principal among whom was Nicolai Rimsky-Korsakov.\(^2\) Taruskin credits Rimsky with the reification of the collection, which the latter described in a letter to Balakirev (1 August 1867) as “a descending scale of semitone, whole tone, semitone, whole tone”\(^3\)—a scale that, during the composer’s lifetime, came to be known as the “Rimsky-Korsakov scale.” In the aforementioned letter, Rimsky describes a passage from his symphonic poem Sadko, which features in the upper voices a descending octatonic scale, supported harmonically by chords related by minor third;\(^4\) this passage becomes an important Leitmotiv throughout Sadko. The mediant harmonies in Sadko, which include harmonic relations not only in the octatonic scale but also in the whole-tone scale, denote what Taruskin calls “evil sorcery.”\(^5\)

Today, the post-Berger generations of scholars have unearthed the scale in music ranging from Weber to Webern.\(^6\) Several studies in the last two decades have focused on the role of octatonicism in French music, especially that of Debussy, Messiaen, and, more recently, Ravel.\(^7\) The octatonic collection is now widely regarded as one of the principal organizational devices of twentieth-century music. However, while theory often lags behind practice, the lag between the use of the octatonic collection in composition and its articulation in theory seems to have been particularly long. The fact that Rimsky-Korsakov never wrote down in any systematic way the theory underlying the scale that bore his name—in the same way that he codified his theories of orchestration—meant that its presence in early modernist compositions, although used frequently and conspicuously by his followers, remained obscure to those outside his circle.\(^8\) Consequently, many composers in the succeeding generation, both Russian and non-Russian, used the collection in a manner that Taruskin describes as “a fortuitous veneer on the surface of common practice,” that is, as an embellishment of diminished or diminished-seventh chords. “True octatonicism,” defined by Taruskin, is identified as the supplanting of functions generated by movement within the circle of fifths by a rotation of thirds or by a tonally stable diminished harmony.\(^9\) Who, before Stravinsky, was


\(^4\) The passage from the composer’s Sadko is reproduced in Taruskin, *Stravinsky and the Russian Traditions*, I, 268, example 4.12. Sadko [1867] was first a symphonic poem, after revising the work in 1869 and 1891, Rimsky-Korsakov wrote an eponymous “opera-legend” [1898], based on the same story.

\(^5\) Taruskin cites an earlier Russian work, Glinka’s 1842 opera *Ruslan and Ludmila*, as the first work to feature a whole-tone scale. Ibid., I, 261.


\(^8\) The absence of any extensive theoretical writing on octatonicism by Rimsky-Korsakov enabled his most famous student, Stravinsky, to declare, famously, “I was guided by no system whatever in *Le Sacre du Printemps*. . . . Very little immediate tradition lies behind *Le Sacre du Printemps*. . . . and no theory. I had only my ear to help me. . . . I am the vessel through which *Le Sacre* passed.” See Stravinsky and Robert Craft, *Expositions and Developments* [Garden City, N.Y.: Doubleday, 1962], pp. 147–48.

the first composer to write “truly” octatonic music?

Interestingly, it appears that an important historical link between nineteenth- and twentieth-century octatonic composition—a link with particular implications for the presence of octatonicism in early modernist French music—is found in the music and theoretical writings of Prince Edmond de Polignac (1834–1901), an aristocrat and amateur French composer who, around 1879, penned not only the first pervasively octatonic composition, but also what appears to be the first treatise on octatonic theory.

Edmond de Polignac, Composer

Polignac, born into one of the oldest aristocratic families in France, was the youngest of the seven children of Prince Jules de Polignac, the ultra-conservative minister to Charles X of France, and London-born Maria-Charlotte Parkyns. Incarcerated and then banished from France (the result of his role in the 1830 collapse of the Bourbon monarchy), Prince Jules moved himself and his family to an estate in Bavaria. Here the young Prince Edmond benefited from the lively intellectual atmosphere of his trilingual household. His older brothers were brilliant mathematicians; playing number games was a standard mode of entertainment among the Polignac children. After the family’s return to Paris in 1847, Prince Edmond began composition lessons with Prix-de-Rome winner Alphonse Thys. In 1856 he was admitted to the Paris Conservatoire to study harmony with Henri Reber, whose Traité d’harmonie would become the standard textbook on that subject until the end of the nineteenth century.11

Following his studies at the Conservatoire, Polignac entered a number of composition contests. His early works, written in diverse vocal and instrumental genres, were conservative and tonal; yet, even at this early stage, unusual key relations held a certain allure: a string quartet from 1860 includes a scherzo movement in B♭ major whose trio was written in the key of E major, at the unusual distance of a tritone. In 1865 Polignac won three first prizes in a contest for choral compositions cosponsored by the city of Paris and the populist men’s chorus, the Orphéon de Paris. In 1867 he placed fifth in an opera contest on the libretto La Coupe du roi de Thulé, by Édouard Gallet and Louis Blau, sponsored by the Ministry of Fine Arts (among the other runners-up were Massenet and Bizet). In 1877 Polignac’s opéra-comique, Don Juan et Haydée, was awarded a first prize in another composition contest (besting a score by André Messager, who won second prize); the work was presented the same year, to critical acclaim, at the Théâtre de Saint-Quentin.12 Despite these successes, his music never reached a wide audience; most of the performances of his compositions took place in private salons, and in private music clubs such as the Cercle de l’Union Artistique, where he made the acquaintance of his musical hero, Wagner.13

It was surely the influence of Wagner that inspired Polignac, in the 1870s, to explore the uncharted territory of triadic atonality.14 A “Fantaisie-Tanz” dating from this period is written in a combination of the minor and Phrygian modes, producing, as the composer puts it in the published score, “a more modern tonality . . . bizarre, disconnected, quasi-macabre.”15 For someone accustomed to playing number games,

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11Henri Reber, Traité d’harmonie (Paris: Colombier, É. Gallet, 1862). Debussy was among the composers who learned harmony using Reber’s textbook during his years at the Paris Conservatoire.

12Revue et Gazette musicale de Paris, 2 December 1877, p. 381.


15Edmond de Polignac, preface to “Fantaisie-Tanz,” from Pièces diverses (Paris: Heugel, 1884). All translations from the French are by the author.
the reordering of the asymmetrical major and minor scales into a symmetrical pattern of alternating half steps and whole steps would not be a far stretch. It was probably in this way that, toward the end of the 1870s, Polignac made his octatonic discovery. He seems to have been unfamiliar with the works of the Russians. No mention is made in his correspondence of the musical events of the 1878 World’s Fair, and his music library, still extant, contains no scores of the Russians. Working independently, Polignac believed that he had stumbled onto something wholly original.

The Octatonic Treatise and “Pilate livre le Christ” (1878–79)

Polignac’s octatonic experiments, studies, and musical sketches were gathered up in a notebook, which the composer named “A Study on the Alternating Sequences of Whole Steps and Half Steps.”16 In this ninety-eight-page treatise, Polignac begins by theorizing the octatonic collection and later offers octatonic-based chord progressions and procedures that can be applied directly to composition. He first spells out what he calls “Series A, B, and C,” using the ascending half-step/whole-step form of the scale, beginning respectively on the semitones C/D♭, B/C, and C♯/D (ex. 1).17 Second, still using the version of the scale beginning with a semitone, Polignac shows that the collection

16Polignac, “Étude sur les successions alternantes de tons et demi-tons,” Polignac family archives [1879]. The 1879 date for the treatise is only conjectural; no date appears in the manuscript, nor does any letter or other document give a date for it. But internal evidence strongly suggests that it was conceived of and written at about the same time as the composition of “Pilate livre le Christ” [see below], which dates from 1878 to 1879.

17There is no standard nomenclature in the theory literature for the octatonic scales. Van den Toorn [in The Music of Igor Stravinsky, pp. 50–51 and “Octatonic Pitch Structure in Stravinsky,” in Pasler, Confronting Stravinsky, pp. 130–56] identifies the three collections as Collection I [ascending half-step/whole step from C/D♭, descending whole step/half step from C♯/B♭], Collection II [ascending from D♭/E, descending from D/C], and Collection III [ascending from E♭/E♯, descending from E♭/D♭]. Polignac’s three scales, in ascending form only, would thus correspond to van den Toorn’s in the following manner: Scale A = Collection III, Scale B = Collection II, Scale C = Collection I. Taruskin [in “Stravinsky’s Angle,” p. 73] uses a Collection I, II, III system whereby the collections begin with the semitones C/ C♯, C♯/D, and D/D♯, corresponding with Polignac’s Scales A, C, and B, respectively. Joseph N. Straus, in his Introduction to Post-Tonal Theory [3rd edn. Englewood Cliffs, N.J.: Prentice Hall, 2005], p. 144, labels each of the three octatonic scales in its half-step/whole-step form according to its numerically lowest semitone, using integer notation [C = 0, C♯ = 1, D = 2, etc.] to identify the pitch classes that begin each collection; the three collections are thus named Scale OCT0,1 [contains C/C♯], OCT1,2 [contains C♯/D], and OCT2,3 [contains D/E♭].
generates major and minor triads [in French theoretical parlance, accords parfaits—that is, triads whose root and fifth form a perfect fifth] on the first, third, fifth, and seventh scale degrees (see ex. 2, reproducing p. 5 of the treatise, bottom right-hand corner of the page). On p. 6 the three collections A, B, and C are given the name the “chromatico-diatonic scales.” A few pages later Polignac offers a harmonic progression using Scale A (see top of ex. 3, reproducing p. 11 of treatise), and he then notes [at the bottom of the same page] that the collection can be broken into two tetrachords a tritone apart—0134 tetrachords if the scale begins with a semitone, 0235 tetrachords if it begins with a whole tone: C–D♭–E♭–G♮–A–B♭, or E–F♯–G–A/B♭–C–D♭–E in Scale A. He then begins to experiment with melodic and contrapuntal figures, as well as harmonic progressions, derivable from the scale, even including “modulations” from one form of the scale to another. By the end of the treatise’s ninety-eight pages he has reached an impressively detailed and complex level of compositional application of the octatonic collection.

Nearly halfway through his treatise, Polignac begins to note specific affective qualities applicable to certain of his octatonic motives. One sketch is described as being of a “serious character, noble, sad, mixed with fright, good for Dante’s Inferno”; “this example,” he writes, “could also be employed for a large celestial choir, Catholic-style because of the dominant sevenths, having nothing to do with Hebraic or Oriental character.” A “Hebraic Swell and March” is “rocked by syncopations.” The final musical sketch is “a motive based on the repetition of the tritone . . . lonely, sad, the song of Pilate.” The treatise concludes with a philosophical afterword about the author’s “essays [and] experiments—not done to please the public.”

The reference to “the song of Pilate,” coupled with a reference to an “example of a passage from scale A to scale C,” suggests that the treatise was being applied to composition even as Polignac was formulating his octatonic theory. In April 1879, Polignac wrote to his brother Ludovic, “I have begun to set, according to the Gospel, the beautiful and dramatic scenes of the Passion. I’ve already almost finished two movements, one including ‘Pilate livre Jesus—tolle! crucifigatur’ etc. . . . I also intend to do the scene at the home of Caiaphas.

Example 2: Polignac, Étude sur les successions alternantes de tons et demi-tons, “Harmonic elements that characterize each of the 3 series or scales,” followed by “the perfect [major and minor] chords” formed by Scales A, B, C.
the high priest, but I'd have to judaize and arabize hard; I'm going to try to bring in a ferocious fugue . . . when the injuries and the blows hail down from all sides.”

Example 3: Polignac, *Étude sur les successions alternantes des tons et demi-tons,* “Diverse harmonic progressions in Scale A” and “Figured basses for the scale beginning on one of the notes of the 4 perfect [major and minor] chords.”

The final product was a work entitled “Pilate livre le Christ” (Pilate Renders Up Jesus), scored for baritone solo, mixed chorus, and orchestra. “Pilate” would eventually become the first movement of a three-movement oratorio based on the Passion of Jesus, entitled *Échos de*
L’Orient judaïque [Echos of the Judaic East]. It is notable that Polignac clearly chose the octatonic collection for music that could depict the Pharisees’ demand that Pilate condemn Jesus to crucifixion: in place of the Russians’ beloved “evil sorcery,” it was being used to depict what might be called “evil, exotic others” [i.e., Jews]. Years later, he would describe this work as “an essay in the application of naturalism in music, consisting of adapting the known character of the music of a people to the interpretation of a dramatic scene depicting this people.”

In other words, Polignac ascribes an essentialist meaning to the octatonic scales: the dramatic depiction of the Passion through music that the composer describes as “fervent, sad, Judaic” reflects the “natural” qualities inherent in the three collections and the sonorities generated by them. By way of research, Polignac obtained the book of synagogue chants used by the Paris Consistory of Jewish Temples, perhaps hoping to find that his experiments had precedents in Judaic tradition. Although there was no octatonicism to be found in the tropes of the traditional nusach, he would ultimately appropriate the shape and style of the chants for use in later octatonic and orientalist compositions.

“Pilate” begins with a loosely imitative orchestral introduction, all the notes of which are derived from Polignac’s octatonic scale B (see ex. 4a, which reproduces the piano-vocal score, mm. 1–28; the one note not in Scale B, the B♭ of m. 6, is a misprint, as is clear from comparison to the orchestral score). The entries of the first three instrumental voices on the pitches A, E♭, and C, respectively (mm. 1–3), spell out three of the four pitches of the diminished-seventh chord that in this passage forms the backbone of the octatonic collection B (the missing fourth pitch, F#/G♭, is added in entrances of voices in m. 11 and m. 13). For the entry of the chorus, representing the Pharisees, Polignac adds a key signature of two flats (ex. 4b; the octatonic introduction had no key signature), anticipating the music’s sudden turn, a few measures later, to a purely diatonic G♭-minor collection. The chorus, intoning the text “Raise him up! Crucify him!” (ex. 4b, mm. 31–43), begins with imitative entries on E♭ and A, in keeping with the introduction’s octatonic scale B, but soon moves to G-centric music. The pitch content of Pontius Pilate’s long solo, which follows, consists mostly of scalar lines in the high baritone range, with the scalar collection changing as his point of view shifts. At first, when he doubts Jesus’s culpability, his vocal line is set on various modal scales: “I find no proof” on a Lydian scale on A♭ (mm. 54–68, not shown), and most of the following text (mm. 69–135, not shown) on the G♭-minor collection with changing pitch centricity. Through much of this section he sings against the angry cries of the chorus; but when they drop out for a few measures, and Pilate comes to the words “The people turn away, and behold that it is I, interrogating him before you, I find no proof in this man of the things of which you accuse him,” the music instantly turns back to collection B of the introduction (ex. 5, mm. 135–62). After a few transitional measures with no clear scalar derivation (mm. 162–68, not shown), in which the chorus demands, “Let his blood be on us and our children! Release Barabbas to us!”, Pilate makes his momentous decision. At his words “Here is your king, take him and crucify him! I am innocent of the blood of this just man whom you see before you,” the music “modulates” to a new octatonic collection—scale A (mm. 169–91, not shown).

This climactic moment marks the halfway point in the work. Much of the remainder consists of further interchanges between Pilate and the chorus, using the scriptural text in Latin, and appropriating Scale B, modal collections along the lines of those used in mm. 69–135, and occasionally even a whole-tone collection. The chorus’s final cries for the release of Barabbas and the crucifixion of Jesus turn to Scale C, thus marking the inclusion of the third and last of Polignac’s octatonic collections in the work. But the end holds a surprise: suddenly the chorus transmogrifies from an angry crowd to a humble band of pious supplicants.
who intone, now in French rather than Latin, a prayer (the text by the composer):

O sweet victor, O King of heaven!
From your executioners one hides one’s face!
Your cross is our star,
Force of the weak, radiant lamb!24

Even more astonishing, the music at the end turns to the “purified” diatonic radiance of C major, replete with functional chord progressions, and an absolutely conventional closing V7–I cadence, even including a 4–3–2–3 suspension figure on the final tonic triad.

The other two movements of the oratorio, “Ruine du temple prédite” (Foreseen ruin of the Temple) and “Christ à Gethsemani” (Christ at Gethsemane), are largely diatonic—with one notable exception: in “Ruine du temple,” the text “Woe to you, Pharisees, hypocrites, vi-

24“O doux vainqueur, ô Roi des cieux! De tes bourreaux la face se voile! Ta croix est notre étoile! Force du faible, agneau radieux!” The words are adapted from a Latin text by Edmond de Polignac.
b. Polignac, “Pilate livre le Christ,” mm. 31–43.

Example 4 (continued)

pers!” is set octatonically, in the style of synagogue chants.

**Incidental Music to Salammbô (1886–88)**

Polignac’s octatonic/orientalist universe eventually came to be peopled by Africans as well as Jews. In September 1886, while visiting the Lake Geneva estate of the Romanian princess Rachel de Brancovan, Polignac had the occasion to hear the “unforgettable, ineffable voice” of the coloratura soprano, Comtesse Marie-Thérèse de Guerne. One of the outstanding musicians of the aristocracy, Mme de Guerne, née Segur, was among Fauré’s favorite interpreters of his works; her silvery voice and in-
terpretive mastery would be immortalized in a 1905 article by Proust. She became the inspiration for Polignac’s next octatonic work, a “Prayer to Tanit,” the text of which he excerpted from Gustave Flaubert’s steamy 1862 novel Salammbô. Flaubert’s story of Salammbô, fictional daughter of the Carthaginian general Hamilcar and priestess of Tanit, is full of incense and color, idol worship, bloody battles, and smoldering sexuality. Apparently begun and completed during his stay at the Brancovan’s Villa Bassaraba, Polignac’s new vocal work, ultimately renamed “Chant à la lune,” depicts Salammbô (as the composer described in a letter to Comte Robert de Montesquiou) praying at night on the terrace of the Palace of the Barea, prostrate before the Moon. Taanach, her servant-nurse, accompanies her on the nebal. “The sounds follow, muffled and hurried, like a buzzing of bees, and, becoming more and more sonorous, they fly in the night with the sores of the waves and the shivering of the tall trees, at the summit of the Acropolis.” The nebal, here, will be replaced by a simple Pleyel.

The voice, carried on the sacred names “Tanit, Baaleet, Rabbetna, Derceto, Mylitta” etc. soon wafts plaintively, muffled from afar, then a terrible heartrending outburst, in a monody (borrowed from

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25Of Comtesse Marie-Thérèse de Guerne née Ségur, Proust wrote: “Hers is probably the unique example of a voice without physical essence—a voice not merely pure, but so spiritualized that it seems to be some kind of natural harmony, begging comparison not to the sighs of a flute, but to a reed in the wind. . . . Neither music, nor even diction, interferes with the delivery of the emotional meaning, conveyed here by the impressive quality of the sound” (C’est probablement l’unique exemple d’une voix sans support physique, d’une voix non seulement pure, mais tellement spiritualisée qu’elle semble plutôt une sorte d’harmonie naturelle, je ne dirai même pas les soupirs d’une flûte, mais d’un roseau dans le vent. . . . Aucune musique, on serait tenté de dire aucune diction n’intervient ici pour rendre le sentiment qui n’est confié qu’à la qualité impressionnante du son). Marcel Proust, “La Comtesse de Guerne,” Le Figaro, 7 May 1905, rpt. in Proust, Contre Sainte-Beuve . . . Essais et articles, ed. Pierre Clarac and Yves Sandre (Paris: Gallimard, 1971), pp. 504-05.

Example 5: Polignac, “Pilate livre le Christ,” Pontius Pilate’s solo, mm. 135–62.
Soon after the opening measures shown in ex. 6a, sketches of accompaniment are intermittently penciled underneath the vocal solo—rapid, arpeggiated sixteenth-note figurations featuring intervals of major seconds and ninths, apparently intended to create a “buzzing bee” sonority. For the vocal line, Polignac clearly used as a model the synagogue chants encountered in his research (ex. 6b). The opening section of the work (“Lent, Recit ad libit.,” mm. 1–20) alternates an incantation of the “sacred names” Baalel and Tanit on ascending perfect intervals with a “patter”-style repetition of the names in thirty-second notes on one repeated pitch. The central second section, “Hymne” [mm. 21–57, not shown], features a daunting vocal line, with tricky rhythms, long stretches of chromatic melisma where the tritone gains increasing prominence, and virtuoso leaps, all based on Scale C. The third and concluding section [mm. 58–81, not shown] recapitulates the elements of the preceding music, ending with a six-measure melisma that descends an

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28Manuscripts of the complete vocal solo and sketches of the orchestral accompaniment of Polignac’s “Chant à la lune,” based on a text from Gustave Flaubert’s Salambô, are housed in the archives of Prince Edmond de Polignac.
a. Polignac, “Chant à la lune” from *Salammbô* (1886), mm. 1–12.

Pour 8 ou 10 altos deux Pianos droits d’Erard une Harp
sourdines
sourdines

[terminer par quelques
accords [harmonie or-
dinaire] aux altos
s’envoltant dans la nuit en balancement
du ouverture d’Euryanthe]

**SALAMMBô**

Echelle du sons employés

Recit ad libit:

(Echo)

Ba - a - let, Ta - nil, A star te',
♭/quart.

Ah!

Ba - rouch ou ou ba - rouch sche -


Octave and a half, on virtuosic thirty-second notes and arubesque-like figures, along Scale C. That the Comtesse de Guerne was willing to undertake this fiendishly difficult project says much about her adventurous spirit. After presenting his soprano with the first sketches, Polignac wrote to his friend Robert de Montesquiou, “Madame de Guerne, at first astonished and thrown off, wasted no time in applying her flexible and implacably accurate voice to the
difficult and wide intervals of my musical canvas, which she will soon brilliantly ornament and illustrate.”

The composer worked on the

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30 Mme de Guerne, étonné d’abord et désarçonnée n’a pas tardi à plier sa voix flexible et implacablement juste, aux intervalles durs et distants de mon canvas musical, qu’elle ornera brillamment et illustrera bientôt” [Edmond de Polignac to Robert de Montesquiou, dated “Sunday” [late Sept. 1886], NAfr 15140, p. 20].

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orchestral accompaniment of the work through the end of 1887.  

Polignac apparently planned to expand his first Salammôb setting into a larger project of incidental music based on Flaubert’s text. The French fashion for “exotic” and orientalist opera had been well established through the popularity of works like Meyerbeer’s L’Africaine, Halévy’s La Juive, and Saint-Saëns’s Samson et Dalila. The music in these works, however, fits squarely into French Romantic idioms, albeit with touches of modality and the occasional distinctive use of orchestral color. The spectacular subject matter of Salammôb lent itself easily to an operatic treatment, and Polignac considered that his octatonic scales would be ideal in evoking both the ferocious barbarism and the steamy sensuality of the story. In late 1886, he wrote a second piece of Salammôb music, entitled “La Danse du Serpent,” scored for a chamber orchestra of unusual composition: two Eb trumpets, two chromatic trumpets, four horns, three pianos (no doubt intended to approximate the jangling sonority of oriental percussion instruments and chimes), harmonium, and strings.

A number of elements foreshadowing modernist procedures can be observed in this piece. First, Polignac introduces one of his newly invented key signatures—the one for Scale C, Ab, and C♯—at the start of the work. In the opening choralelike section (“far-off chants by the priests in the Temple of Tanit”), the dyads D/G, B/E, and G♯/C♯ progress in slow rhythmic values, parsing the collection in minor thirds (ex. 7a). The contrapuntal, two-voice section that follows (“Salammôb, with a swaying of her whole body, chanted prayers . . .”) features a swaying scalar head motive (not shown); the ensuing tail motive (“the cithara and the flute began to play together,” mm. 1–3 of ex. 7b) leads quickly to an ascending octatonic scale that reaches a climax at m. 8 of ex. 7b. This melody becomes the principal theme in the main § section, “La Danse du python,” a giguelike dance that projects the octatonic collection in both the melody and the bass. As the dance builds toward its climax (“The music continued . . . ever the same, hurried and frenzied; the strings grated, the flute blew”), the tempo shifts, by means of a metric modulation, into a 2\text{\textfrac{1}{4}} Allegretto deciso, featuring the 0235 ostinato tetrachord in the treble voice, set against a bass accompaniment of successive ascending fourths, the lower note of each fourth progressing through the diminished-seventh chord A–B–D–F, ascending in sequences of minor thirds [mm. 97–104, not shown]. While Polignac is no Stravinsky, one nonetheless easily recognizes a primitive foreshadowing of Stravinskian procedures. The piece concludes with a fragmentation of the “python” motive and a variation of the opening chorale.

In 1888 Polignac grouped the octatonic “Danse du Serpent” (called “Danse du Python” in some print sources) and “Pilate livre le Christ” together with a third work [in Dorian mode], “Marche des Pasteurs d’Ephraïm,” under the general title Échos de l’ancien Orient. That spring, the trio of works received two performances. The first took place on 14 May, at a soirée in the Paris mansion of the celebrated haut bourgeois art collectors, Édouard

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31Polignac’s sketches for the “Chant à la lune,” including the unfinished orchestration of the vocal line, are found in a notebook in the archives of Prince Edmond de Polignac; various pages are dated 22 December [1886], 7 February 1887, 12 April 1887, and August 1887.

32For an in-depth discussion of the fashion for using Oriental and Arabic subjects as the basis of composition, see Ralph P. Locke, “Cutthroats and Cashah Dancers, Muezzins and Timeless Sands: Musical Images of the Middle East,” this journal 22 (1998), 20–53.

33Eventually Flaubert sought out Berlioz’s protégé Ernest Reyer to write an opera on Salammôb. The work received its Brussels premiere in 1890 and was performed by the Opéra de Paris in 1892.

34While the conductor’s score has not been found, the individual instrumental parts are still housed in the archives of Prince Edmond de Polignac. The composer’s decision to exclude wind instruments from his orchestration is notable, especially when compared to the “exotic” music of future modernist composers, such as Debussy, Ravel, and Stravinsky, who relied so heavily on the particular orchestral color of woodwinds to evoke the ancient and the Eastern.

35The text of the tenor solo in the “Marche des Pasteurs d’Ephraïm” is written in a curious faux Hebrew. Polignac apparently entertained the notion of incorporating this text, sung as a descant, in the “Danse du Serpent”: portions of the vocal line are penciled into the tenor part of the score of the “Danse,” which precedes the “Marche.” It is not known whether this strange juxtaposition of Hebraic and Carthaginian programs was actually realized in performance.
and Nelly Jacquemart-André, the program also featured the works of the aristocrat composer Comte Eugène d’Harcourt and Gabriel Fauré. With the unlimited resources that Madame Andrè put at his disposal, Polignac was able to assemble the instrumental forces that con-
formed to his somewhat odd theories of orchestration. In addition to trumpets, horns, and timpani, “we will have three pianos and around twenty stringed instruments. Fauré will play one of the pianos. . . . Eugène d’Harcourt is in charge of recruiting the players from among the young students of the Conservatoire. . . . We can see in these weekly gatherings the point of departure for some curious musical expres-
sions.”

The society columnist for Le Figaro,

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56The Jacquemart-André mansion, on Paris’s Boulevard Haussmann, is today the art museum bearing the name of the house’s former owners. A printed program of the Polignac works presented at the Jacquemart-André salon (archives of Prince Edmond de Polignac) includes a note that “Danse du python” was written “sur une nouvelle gamme.”

57Eugène d’Harcourt (1859–1918) was a composer from the aristocracy. In 1892 he financed the construction of a concert hall, the eponymous Salle d’Harcourt; from that year until 1900, the composer-turned-conductor produced and directed several series of “Concerts populaires” and “Concerts historiques.”

In attendance for the performance, was clearly puzzled by the unfamiliar harmonic palette of the works, writing that Polignac’s octatonic music “contains the same hallucinatory intoxications that fill the books of Loti.”41 A more enthusiastic reaction to the work, however, was published by critic Alfred de Lostalot after a repeat performance of Polignac’s work at the Conservatoire two weeks later.40 “La Danse du Python” is written on a new scale where a whole step is invariably followed by a half-step,” wrote the critic. “The artist had to vanquish some almost insurmountable technical obstacles,” he continues, “but the effort was nowhere apparent, and one took the greatest pleasure in listening to it.”41 Lostalot’s review is important not only to the readership of Paris “a new scale,” but it records, for the first time in print, a description of the octatonic collection.

In late 1888, “La Danse du Serpent,” in a reduction for solo piano, was published in a music album of short works for piano, entitled La Danse, offered by the daily newspaper Le Gaulois to its subscribers.42 The editor of the volume, at a loss to describe Polignac’s eccentric contribution, wrote in the introductory note: “Be certain that banality will never fall from his pen. He has audacities, he even has strangenesses, and he is someone.”43 Despite this equivocal praise of the composer and, presumably, of his music, the publication of “La Danse du Serpent” is historically important:

[The text continues with footnotes and further discussion involving specific musical terms and compositions.]
his thoughts on the meaning of the scales and octatonicism. The first, “When one stone is taken away, the whole edifice collapses,” surely refers to the “collapse” of tonality resulting from the reordering of whole steps and half steps; the second, “He hears first an astonishing screech of sounds, [which] then [sound] gentler, forming together in one group,” undoubtedly expresses the composer’s hope that the gritty “screech” of octatonicism will eventually be accepted and find a wider audience. One final Latin phrase, from Virgil, is cited just underneath a spelling-out of the three scales, at the bottom of the first page: “God loves odd numbers”46 (ex. 8b).

46The Latin phrases cited by Polignac are, respectively, “Ablatâ petrarum unâ, Tota corruit Ædes”; “Auditû primum Stupente stridorem, jam lenitam, Tonorum in unum compellere Gregem”; and, “Numero Deus impare Gaudet” (Virgil).

b. Polignac, “Exercice pour orgue,” bottom of the first page, with the three octatonic scales spelled out, followed by a phrase from Virgil, “God loves odd numbers.”

Example 8

ALEXANDRE DE BERTHA AND THE "GUERRE DES GAMMES" OF 1894

On 27 November 1893—just around the moment that Edmond de Polignac and Winnaretta Singer were making preparations for their wedding—a Hungarian musicologist, composer, and critic named Alexandre de Bertha read a scholarly paper, entitled “Testing Out a System of New Scales,” to an erudite Parisian audience of composers, performers, musicologists, and critics. The subject of the paper was the author’s recent invention of what he dubbed “the enharmonic scales”—which, despite their misleading nomenclature (for Bertha does not use the term “enharmonic” according to the commonly understood definition of the term), are recognizable to modern readers as the octatonic scales.47

Born Sándor Bertha,48 Alexandre de Bertha (1843–1912) was best known for his articles on Bohemian and Hungarian music, two of which were included in Lavignac’s Encyclopédie de la musique.49 His compositional output, published between 1867 and 1897, consisted mostly of

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47Alexandre de Bertha, “Essai d’un système de gammes nouvelles” [Paris: P. Mauret [probably late 1893]], 16pp. A copy of the monograph is housed in the Bibliothèque Nationale de France, Music Department, L.9.382. The paper was reprinted shortly thereafter under the title “Un système de gammes nouvelles,” in La Nouvelle Revue 86 (1 Jan. 1894), 125–37. In a letter to the editor of Le Figaro [28 Feb. 1894], Bertha cites among those present at his initial lecture the composers Ambroise Thomas and Victorien Jonciers; the writers Albert de Lavignac, Arthur Pougin, Albert Soubies, and Édouard Mangeot; piano pedagogues Antoine Marmontel and Louis Diémer; and baritone Salvatore Marchesi.

48Sándor Bertha” rates a brief article [by Katalin Szerző] in Grove Music online. The article mentions his composition studies with Moritz Hauptmann and his piano studies with Hans von Bülow and lists a number of his major compositions.

short piano works: *airs hongrois*, waltzes, polonaises, “Andante religieux,” and so forth.\footnote{Almost two dozen of Bertha’s piano works, published between 1867 and 1899, are housed in the Music Department, Bibliothèque Nationale de France.} While the majority of these works are diatonic, a handful of them, especially the several *csárdás*, are written on the so-called Hungarian scale, a harmonic-minor scale with a raised fourth (hence containing two augmented seconds, between scale degrees 3 and 4 and between 6 and 7, e.g., C, D, E♭, F♯, G, A♭, B, C).\footnote{See, for example, Bertha’s “Czardas” [1887] and “Kolping” [1894], both housed in the Music Department, Bibliothèque Nationale de France.} While no documentation exists to explain the process that led Bertha to his octatonic epiphany, it can reasonably be assumed that a slight reordering of the elements of the Hungarian scale led him to discover the repeating pattern of whole step/half step that defines the collection. Unlike Polignac, Bertha did not view his octatonic discovery as radical, but as a middle ground between the diatonic and chromatic scales. Rather, it was his frustration with what he perceived as “a halt in the development of harmonic progression” and “the abuse of the modern use of dissonance”—especially in the music dramas of Wagner—that inspired him to create “special scales” that could “marvelously express the floating psychological state of our era.”\footnote{Bertha, “De la Possibilité de nouvelles combinaisons harmoniques,” part 1, *Le Ménestrel* [14 July 1895], 219–20.} When Polignac read Bertha’s article in *La Nouvelle Revue*, he recognized Bertha’s “enharmonic scales” as his own “chromatic-diatomic” scales. Outraged, he sent a letter to the editor of *Le Figaro*, railing against what he considered to be artistic theft. “I insist,” he wrote, “on authenticating my rights of absolute priority as to the invention and the application of these scales.” As justification, he recalled the 1888 publication of “La Danse du Serpent,” the appearance of two of the scales on the piece’s last page, and Lostalot’s favorable review of the work. “I deem by these facts,” he concluded, “that the public was sufficiently well-informed.”\footnote{Edmond de Polignac, “Boîte à lettres,” *Le Figaro*, 24 February 1894, p. 3.}

In January 1894, Bertha’s “System of New Scales” was published, in slightly modified form, in the journal *La Nouvelle Revue*. Bertha’s treatise covers much of the same ground as Polignac’s from fifteen years or so earlier, and in a manner that is more fleshed-out and written with more polish (plate 2 reproduces the page on which he introduces the new scale). If Polignac’s treatise is a handbook for composers, Bertha’s seeks to reach scholars of musical aesthetics and pure theory. (Although Bertha writes a few chord progressions demonstrating the harmonic use of the collection in his treatise, these never ended up, apparently, in any full-length compositions.) From a theoretical standpoint, there are several important differences between the two treatises. First, Bertha deals more extensively with the two different forms of the scale, the one beginning with a half step/whole step and the other beginning whole step/half step (plate 3), and he provides useful names for them, *première homotone* and *deuxième homotone* (homotone meaning “same tonic”).\footnote{Bertha, “Un système de gammes nouvelles,” *La Nouvelle Revue* 86 [1 Jan. 1894], 127–28.} He discusses at length the shared pitch content among the three transpositions of each form—four common tones between scales A and B, and the remaining four between scales A and C, and the consequent implications for harmonic relationships: “It’s not only because of their mixed sonority that we have assigned a place to the ‘enharmonic scales’ between the diatonic scales and the chromatic scales; their theoretical structure borrows their constituent elements equally from both.”\footnote{Ibid., pp. 129–30.} It’s strange that no musician before me noticed the possibility of arranging tones and semitones symmetrically. It’s a fact that is within reach of everybody.

It’s quite another to deduce a complete system, determining the resources that this new arrangement of intervals furnishes to melody, harmony and counterpoint. I have under my eyes neither the
nous familiariser au point que nous le sommes aujourd'hui. On peut même prétendre qu'ils expriment à merveille l'état psychologique si flottant de notre époque. Donc les prendre à leur tour comme unité pour la construction des gammes nouvelles nous semble être tout indiqué. En tenter au moins l'essai doit séduire tout homme tourmenté par l'idéal.

II

On compte cinq tons et deux demi-tons dans une gamme diatonique majeure et trois tons, une seconde augmentée et trois demi-tons dans une gamme diatonique mineure. Si l'on divise maintenant chacun de ces tons en deux demi-tons, la seconde augmentée en trois, on obtient pour chaque gamme un total de douze demi-tons, qui se retrouvent ensemble dans la gamme chromatique.

La division de ce total en parts égales est depuis longtemps usitée dans l'harmonie, comme le prouvent les accords de septième diminuée et de quinte augmentée, le premier ayant un quotient de trois et le second de quatre demi-tons. Il en résulte que chaque note dont ils se composent peut être considérée comme basse fondamentale par suite de changements enharmoniques subis. Étant identiques dans plusieurs tonalités, il n'existe du premier accord que trois formes et du second que quatre.

Avec des précédents semblables, si l'on conclut à la possibilité d'une gamme symétrique, on ne peut pas être taxé d'aberration. Car ayant des demi-tons tempérés entièrement à notre disposition — comme il a été dit plus haut — grâce à l'habileté de nos exécutants et à la perfection de nos instruments, et reconnaissant que leur répartition actuelle n'a rien de régulier, qu'est-ce qui nous empêche de les grouper dans une progression arithmétique, en alternant les demi-tons seuls avec la réunion de deux demi-tons en un ton et vice versa, c'est-à-dire :

\[
\frac{1}{2} + 1 + \frac{1}{2} + 1 + \frac{1}{2} + 1 + \frac{1}{2} + 1
\]

ou

\[
1 + \frac{1}{2} + 1 + \frac{1}{2} + 1 + \frac{1}{2} + 1 + \frac{1}{2}
\]

combinaisons, qui donnent également un total de douze demi-tons? Et effectivement des gammes pareilles, construites sur

Plate 2: Alexandre de Bertha, excerpt from “Système de gammes nouvelles”
(\textit{La Nouvelle Revue}, 1894).
Plate 3: Bertha, excerpt from "Essai d'un système de gammes nouvelles."
The two men faced off that spring in a battle of dueling treatises, presented before the prestigious French Academy of Sciences and subsequently published in the Academy's proceedings as new discoveries in the field of "Musical Acoustics." Bertha's paper was read first, in May 1894; he presented in concise form the basic qualities of the scales in their two forms. Polignac, as respondent, was put in the unhappy position of defensively reclaiming his right of priority, harking back once again to the publication of the scales in 1888.

In 1895 Bertha expanded his treatise into a three-article series in Le Ménenestrel. "Experiments have demonstrated," wrote Bertha, "that the scales enrich melody and harmony with new colors... The real harmonic originality of the new scales stems from the surprising manner in which one can group together... all the eight major and minor chords on the second degree, thus producing a logical and agreeable bringing together of the most distantly related chords, disconcerting the wisest harmonist... so attractive and unforeseen is the sonority." In the third installment of the article, Bertha makes an important connection with the past: "Citing the finale of Beethoven’s F-Major Variations on a Theme of Süssmayer, where the main theme is reproduced on the four major chords from the common notes from the two homotones (F–A♭–B–D), and recalling an identical progression that Rossini uses in the finale of Guillaume Tell, it proves... that unconscious allusions to the new system are not lacking in the music of the great masters." After this, Bertha seemed to abandon the octatonic argument in public forums. And none of his later compositions bear any trace of his "discovery." After Bertha’s death in 1912, Henri Heugel, editor-in-chief of Le Ménenestrel, wrote in the "Necrologie" column, “Bertha had dreamed up, thirty years or so ago, a new musical system, the details of which I no longer remember, although he spoke to me about it at length on diverse occasions.”

Polignac, on the other hand, continued to explore the potential of the octatonic scale un-
til the end of his life (1901). A sketchbook, begun in May 1890 and with a final entry dated April 1900, is filled with themes and exercises based on all three collections of the scale; it is entitled “Harmonies of Two Sounds [i.e., dyads] in Fifths and Fourths: ‘Greek’ style—Orgiastic Threnodies of Pan and Hebraic Processes.” Edmond de Polignac, sketchbook, “Harmonies de 2 sons de 5es et de 4tes: Genre ‘grecques’—Threnodies Pan Orgiastiques et processus Hébraïques,” archives of Prince Edmond de Polignac.

Contemporary composers were impressed as well: Gabriel Fauré wrote to the Princesse de Polignac, “I don’t know if [the Prince] is aware of the real impression that his Pilate has made on people who are not imbeciles!” In 1905, when “Pilate” was played again in a concert conducted by Alfred Cortot, Fauré, now music critic of Le Figaro, devoted a long article to the work.

[Polignac’s] conscience commanded him to speak his own language, even at the price not only of not being understood right away, but also to be not a little mocked at . . . .

Here we are concerned with texts that have given rise to many masterworks. But no one yet was concerned with translating the spirit, with expressing the feelings, or with evoking at the same time the milieu in which the Prince de Polignac had such poetic vision . . . . Here, the eloquence of the text and the emotion of the scenes are enveloped in a truly far-off atmosphere, tinted with a truly Oriental color . . . .

From this music, which recounts so well and which translates with such gripping accuracy, and which creates, at the same time, such vivid images, emanates an impression too real to escape.

Conclusion

The contemporaneous “discovery” of the octatonic scale by two different individuals, entirely independent of the collection’s earlier applications by German and Russian composers, can be attributed in part to a logical development in a tonal system that was rapidly becoming chromaticized, but I believe that it speaks to a deeper cultural need. If we look back on the history of another art form, for example, the first photograph was taken in 1827, but photography as a science was not invented until 1839. The imagination that wanted photography was only ready for its reification when it had reached a certain state in its technical advancement. Similarly, the Romantic musical imagination that dared to break the mold of conventional diatonic procedures, moving gradually into the realm of mediant-related harmonic progressions, would have to wait until 1867 for the scale governing some of those pro-

65Edmond de Polignac, sketchbook, “Harmonies de 2 sons de 5es et de 4tes: Genre ‘grecques’—Threnodies Pan Orgiastiques et processus Hébraïques,” archives of Prince Edmond de Polignac.

66Je ne suis pas bien sûr que les auditeurs aient goûté les hardiesses harmoniques et les nouveautés diatoniques par lesquelles se distingue la nouvelle partie: ‘Pilate livre le Christ’; par contre, toutes les pages de cette oeuvre intéressante où la musique et la poésie semblaient indissolublement unies ont fait grand effet sur eux . . . . Voyons le compositeur, maître de son talent, user avec la plus grande habileté des dernières conquêtes de la musique moderne” (Charles Joly, “Les Oeuvres du Prince Edmond de Polignac au Conservatoire,” Le Figaro, 17 May 1901, p. 1).

67“Sa conscience lui commanda de parler son langage propre, même au prix non seulement de n’être pas compris tout de suite, mais aussi d’être quelque peu râillé . . . .

Ici il s’agit de textes qui ont fait naître plusieurs chefs-d’œuvre. Mais personne encore s’occupait de traduire l’esprit, d’exprimer les sentiments, ou d’évoquer en même temps le milieu dans lequel le prince de Polignac a eu une vision tellement poétique . . . . Ici, l’élégance du texte et l’émotion des scènes sont enveloppés dans un atmosphère vraiment lointain, teint avec une couleur vraiment orientale . . . .

De cette musique qui raconte si bien, qui traduit avec une justesse si saisissante et qui fait naître, au même temps avec si vivantes images, se dégage une impression trop réelle pour qu’on y puisse s’échapper” (Gabriel Fauré, “Échos de l’Orient Judaique du Prince Edmond de Polignac,” Le Figaro, 19 April 1905, pp. 5–6).
centuries to be reified, and another dozen years until that scale was theorized.

It is not inconceivable that the early French modernists might have been influenced by Polignac’s music and treatise. The public debates and articles surrounding Polignac’s “octatonic wars” with Bertha would surely have been followed with interest by composers who read *Le Figaro* and the leading journals of music and culture. Claude Debussy, an octatonic composer (of the “fortuitous” type, according to Taruskin), was introduced to the Prince and Princess de Polignac in 1894 by musical salon hostess Marguerite de Saint-Marceaux, and subsequently frequented the Polignac salon; an 1895 letter to Pierre Louÿs attests to Debussy’s interest in—and implied admiration of—Polignac’s music.

Maurice Ravel (in Taruskin’s terms, a “true” octatonic composer) began to attend the musical gatherings in the late 1890s, in the company of his teacher Gabriel Fauré. While both composers—especially Ravel—were influenced by the Russians, both would also have had many occasions to hear Edmond de Polignac holding forth on “his” scales. It is impossible to prove Polignac’s influence with absolute certainty, but what is certain is that Debussy and Ravel can be placed in the Polignac salon—in Ravel’s case, well before the date of his first octatonic essays; therefore this indigenous source of influence cannot be ruled out.

In any event, Polignac’s octatonic compositions and treatise, and Bertha’s subsequent writings on the same subject, must now take their place in the history of the theoretical recognition of the collection. Although Rimsky-Korsakov’s 1867 description of the “half step, whole step” scale will remain its first written reification, the first published description of the octatonic scales, originally attributed to Berger in 1963, must now be moved backward to 1888 and attributed to Edmond de Polignac.

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Abstract.
The reification and theorization of the octatonic scale, arguably one of the principal organizational devices of twentieth-century music, have been long in coming. Rimsky-Korsakov was the first to describe the scale, in an 1867 letter, discussing its use as a Leitmotiv in the symphonic poem *Sadko*. Stravinsky used the collection as the basis for many of his groundbreaking works, especially *The Rite of Spring*, but never acknowledged the fundamental role that the “Rimsky-Korsakov scale” played in his compositional technique. It took another thirty years for Messiaen to identify the collection as one of the “modes of limited transposition.” And another twenty years would pass before Arthur Berger, in a 1963 article, coined the name “octatonic scale.”

The post-Berger generation of scholars, beginning with van den Toorn and Taruskin, have continued to shed light on the functional and formal uses of the octatonic scale. Taruskin has traced the influence of Schubert’s and Liszt’s use of harmonic progressions based on mediant and diminished-seventh relations on Rimsky-Korsakov, who in turn influenced a whole generation of early modernist Russians. However, the fact that Rimsky-Korsakov never wrote down in any systematic way the theory underlying the scale that bore his name—in the same way that he codified his theories of orchestration—meant that its presence in early modernist compositions, although used frequently and conspicuously by his followers, remained obscure to those outside his circle. Therefore, the presence of the octatonic collection in the music of non-Russian early modernist composers cannot be easily explained, and the sources of influence are harder to trace.

Interestingly, it appears that an important historical link between nineteenth- and twentieth-century octatonic composition—a link with particular implications for the presence of octatonicism in early modernist French music—is found in the music and theoretical writings of Prince Edmond de Polignac (1834–1901), an aristocrat and amateur French composer, who, in 1879, penned not only the first pervasively octatonic composition, but also what appears to be the first treatise on octatonic theory; he went on to write several other compositions based on the “gammes chromatico-diatoniques.” In 1894 one of Polignac’s contemporaries, musicologist Alexandre de Bertha, wrote and lectured extensively about his “discovery” of the “gammes enharmo-niques.” In this article, I examine the reception of the works and ideas of Polignac and Bertha by contemporary critics and composers, and Polignac’s role as an important precursor of modern octatonic theory.