

The Vocal Ecology of Crumb's Crickets

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Abstract

Making sound is characteristic of agency in the natural world. It is curious therefore that having separated pitched sound from nature as much as possible—disciplined it into scales, temperaments, etc.—Western music has for centuries made extraordinary efforts to imitate natural sounds and processes with this un-natured sound. Whereas music often depicts nature, “music” has become abstract and transparent, and musical sounds themselves have become little more than acoustic tokens of objects related by structure. Any metaphorical connections with extra-musical sounds are suppressed in discourse about music because they constitute “effects.” In this article, I interpret the first movement of George Crumb's Ancient Voices of Children (1970) as an expression of agency in the soundscape, considering vocal sounds, especially those attributed to crickets, as acts in a vocal ecology rather than imitation of natural sounds for programmatic purposes. My analysis invites us to hear this music—and music in general—as acoustic expression in a soundscape and therefore in ecological terms.

Prologue

I am teaching the Child to speak.

It is a difficult process. I have long since discovered on our expeditions together that he can imitate any of the birds or animals we come across, and he delights in showing off to me how he can whistle like the big hawks we see occasionally floating high up under the clouds or throw his voice, *pic pic*, against the bole of a tree, like the woodpeckers of my childhood, the sacred spirits of our Sulmo countryside. He stands with his feet apart, hands on hips, head held back to the light, and his lips contort, his features strain to become those of the bird he is mimicking, to become beak, crest, wattles, as out of his body he produces the absolute voice of the creature, and surely, in entering into the mysterious life of its language, becomes, for a moment, the creature itself, so that to my eyes he seems miraculously transformed.

Sometimes he uses his hands like an instrument to trill and flute, blowing across his fist and fluttering his fingers. At other times the cry simply floats out of him, high and clear, or the warbling comes from deep in his throat, a guttural murmuring, or his body suddenly gives forth a metallic creaking so that I am startled by its closeness. It is as if each of the various bird species—ground pigeons, crows, waders, high-flying migratory birds that have been who knows where over the horizon—had their life in him and could be drawn out on the breath between his lips; as if he had some entrance to their mysterious comings and goings among the grasses, or had been with them to the bottom of the river where the water

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birds dive after their prey, or in the high places of the air where imagination fails to follow them or to catch with the ear how their cries are translated at the margin of the stars.¹

The narrator is Ovid, or rather novelist David Malouf's imagining of the Roman poet in his Scythian exile, telling of the feral child he has taken in. To be sure, Malouf's Ovid is a modern mind, concerned here with language and reason as markers, simultaneously, of humanness and human alienation from Nature.² But there is more. Malouf's Ovid here begins to recognize that the Child's vocal behavior is *ecological*. That is, he is not merely imitating the hawk or the woodpecker, he in his full humanness *speaks hawk* or *speaks woodpecker*, announcing his presence in the soundscape in the languages of his fellow creatures. And it dawns on the poet that, paradoxically, the Child is in some way more fully human than Ovid and his former fellow citizens, that their modernity has separated them from the world.³

The separation involves a suppression of the ecological impulse in language and culture; or, more benignly, it involves uncritical acceptance of a "misleading distinction" between immaterial and material aspects of culture according to which "language, tradition, art, music, law, and religion are immaterial, insubstantial, or intangible, whereas tools, shelters, clothing, vehicles, and books are not."⁴ We may casually accept the notion of music as acoustic expression in a soundscape, but recognizing music's ecological impulse challenges the place of natural sounds in Western musicology.⁵ Having separated pitched sound from nature as much as possible—disciplined it into scales, temperaments, etc.—Western music culture has for centuries made extraordinary efforts to imitate natural sounds and processes, whether through madrigalisms and word-painting, or more recently, recorded or synthesized sound and so-called extended performance techniques. Traditional musicological discourse rarely takes these timbral practices into account. If it does, then they are considered secondary to form, motivic development, and pitch structure, or understood to represent abstract cultural categories—"high" or "low" social status, the sacred or the profane, the pastoral, etc. A musical sound's maker is not considered an agent, and the sound's timbre is not recognized as directly transmitting crucial information of the maker's identity, position, emotional attitude, or conditions in which maker and hearer encounter one another.

One consequence of this situation is the uncertain value of sound source and timbre for understanding a composition's structure. This is especially true for

¹ David Malouf, *An Imaginary Life* (New York: Braziller, 1978), 90–91.

² Earlier in the novel, Ovid muses on the dubious humanity of his hosts in contrast to the civilized Romans among whom he once counted himself. The character's eventual inversion of this opposition is a central plot line.

³ Malouf, *An Imaginary Life*, 97–98.

⁴ James J. Gibson, *The Senses Considered as Perceptual Systems* (Boston: Houghton Mifflin, 1966), 26.

⁵ The term "soundscape" was coined by R. Murray Schafer in *The Tuning of the World* (New York: Alfred A. Knopf, 1977). Rather than an acoustic version of a pictorial landscape—with sound objects arranged in space like the features of a landscape—it is better understood as referring to the specifically acoustic dimension of being immersed in what anthropologist Tim Ingold calls the "fluxes of the medium" in which we are alive by moving in it. See Ingold, "Against Soundscape," in *Autumn Leaves: Sound and the Environment in Artistic Practice*, ed. Angus Carlyle (Paris: Double Entendre; Creative Research into Sound Arts Practice, 2007), 10–13.

non-tonal music of recent decades, such as the work of George Crumb. Performers and audiences are familiar with Crumb's use of idiosyncratic performance directions, non-canonical instrumentation, vocalizations, and quotation. Critics have called these practices "novelties," "spooky effects," and "childlike," even in laudatory reviews.⁶ Scholars are not sure how these features should be interpreted in the context of Crumb's evident and delightfully elaborate and symmetrical motivic designs. In this article, I claim that the questions posed by Crumb's characteristic use of sound are answered by renewing an understanding of music as ecological utterance, as expressive engagement in the natural soundscape. I offer as a case study "El niño busca su voz," the first song of Crumb's cycle *Ancient Voices of Children* (1970) on texts by Federico García Lorca. I argue that the song enacts the vocal ecology of natural soundscapes in which humans and fellow organisms—crickets, in this case—interact and make claims of place and self. I begin with a brief account of the form and then explain my ecological approach to vocal expression before turning to analysis of the text and music themselves. More broadly, this study demonstrates the value of recognizing music as a member of a family of acoustic behaviors human beings share with other organisms to which both makers and hearers attribute meaning and purpose in the soundscape.

Music, Song, and Ecology

Ancient Voices of Children is scored for soprano and boy soprano, and a chamber ensemble of oboe, mandolin, harp, "electric piano" (that is, a standard concert grand fitted with contact microphones and connected to an amplifier and speakers), and a percussion suite needing three players. The oboe and mandolin are not used in "El niño."

Table 1 outlines the form of "El niño" according to its layout in the 1970 edition of the score.⁷ In the table and throughout this article, locations of passages in the score are given in the form x,y , where x is the page number and y is the system. For example, the soprano sings the first line of the text at 1.6, or the sixth system on page 1.⁸

The A section (1.1–1.5) begins with a vocalise in which the soprano soloist sings cycles of vowels, along with other figures, into the open, amplified piano. Two more vocalises follow, alternating with instrumental interludes. The B section (1.6–2.1) begins with the first sung text of the song, after which the score calls for the three

⁶ Donal J. Henahan, Review of *Echoes of Time and the River (Echoes II)*, performed by the Chicago Symphony Orchestra, *Musical Quarterly* 54/1 (1968): 84; Robert Moevs, Review of *Music for a Summer Evening (Makrokosmos III)*, Nonesuch H 71311, LP, *Musical Quarterly* 62/2 (1976): 302; Henahan, Review of *Eleven Echoes of Autumn, 1965*, by George Crumb, etc., CRI 233 USD, LP, *Musical Quarterly* 55/2 (1969): 281.

⁷ George Crumb, *Ancient Voices of Children* (New York: C. F. Peters, 1970).

⁸ See William E. Lake, "Form and Temporal Proportions in George Crumb's *Ancient Voices of Children*," in *George Crumb and the Alchemy of Sound: Essays on His Music*, ed. Steven Bruns and Ofer Ben-Amots (Colorado Springs: Colorado College Music Press, 2005), 85, 87, for a similar ascription of form to the song. Lake does not distinguish between what I label A and B sections, however. My designations are suggested by the use of voice, not just in the sense of the soprano part in the ensemble, but in the way Lorca's text treats the concept of voice and the ways Crumb interprets Lorca through the use of different kinds of voice.

Table 1. Form of George Crumb, *Ancient Voices of Children*, I. “El niño busca su voz,” according to the published score (1970).

Section	Passage	Page and System in Score
A	Vocalise 1	1.1–1.2
	Interlude 1	1.2
	Vocalise 2	1.2–1.4
	Interlude 2	1.4
	Vocalise 3	1.4–1.5
B	Narrator: first stanza, lines 1–2	1.6
	Cricket sounds; whispered repeat of first stanza, line 2	1.6–2.1
	Boy: “after-song,” second stanza	2.1

percussionists to whisper “cricket sounds.” We know how to speak about the pitches of the soprano’s vocalise, and we are likely to say that the striking timbre and texture change when the cricket sounds begin help to articulate the division between A and B sections, but we are not sure how to analyze these sounds. We might label the cricket sounds in the song as *Nachtmusik*, but this suggests an affective signal at best. We might say the vocal techniques called for by Crumb are “effect” or “color.” Yet in so doing we implicitly exempt them from any evaluation of pitch-class relations and motivic development, subtly but unmistakably distinguishing them from “the music.”⁹ It cannot be otherwise, because if these sounds specify something or someone, then they must be extra-musical.

The sounds do indeed specify: the vowel cycles specify a voice—and thus one who would speak—making the sounds of which language is made; and the sounds made by the percussionists specify crickets and all that the sounds of crickets entail—to humans and to other crickets. The song engages with the world through a negotiation of identity, agency, territory, and survival; that is to say, the song enacts an acoustic, and specifically vocal, ecology.

By no means have Western musicians assumed, at least not for a long time, that music is ecological in this way. Gary Tomlinson has ascribed a suppression, or purification, of the category music to the eighteenth century disciplining of *song*. From ancient times through the Renaissance, song had power. Tomlinson writes,

[T]he ability of song to affect listeners was conceived as an alteration worked on body, soul, and the faculties that mediated between them. This view took for granted the impact of song on the immaterial aspect of the human organism, soul. In doing so it recognized the power of song to set in motion complex psychophysiological relations between the human organism and the surrounding cosmos.¹⁰

After the eighteenth century “emancipation” of instrumental music from vocal, “Nothing could seem more self-evident to us, after all, than that song is a kind of music, that a song is ‘a piece of music’ . . . or that singing is a musical activity.” Tomlinson calls for a reconfiguration of musicology as “cantology,” the first aim of

⁹ Our language for technical description of musical sound is alienating in the same way as that Malouf’s Ovid characterizes Latin. See Malouf, *An Imaginary Life*, 98.

¹⁰ Gary Tomlinson, “Vico’s Songs: Detours at the Origins of (Ethno) Musicology,” *Musical Quarterly* 83/3 (1999): 346.

which “would be to break out of this naturalized hierarchy, to grasp and live with an arrangement in which music is a subcategory of song and music-making a songish thing.”¹¹ And music making, as a songish thing, is *efficacious*: through it the singer makes things happen in the world, or means to do so. In short, song is ecological. The suppression of its efficacy is, at least in part, a suppression of music's ecological agency, just as Roman language and culture in Malouf's Ovid's account suppresses the ecological agency he witnesses in the Child's birdish vocalizing. Musical sounds, divorced from ecological context and potential efficacy, become, in Marion Guck's term, *music-literal*.¹² That is, just as metaphorical terms such as those for pitch “height” have come to be understood as literal and therefore naturally true of the musical phenomena they describe, so to have the sounds themselves: the timbre of a horn or of a singing voice has only aesthetic value; any echo of a bellowing aurochs or a weeping mother is extra-musical.¹³ The metaphors, like the music they conceptualize, have become transparent.¹⁴

From the ecological perspective I adopt here, Crumb's song re-inverts the song-music relation and enacts a familiar nocturnal soundscape and its vocal ecology: when crickets have voice, humans are mute, and vice versa.

My claims for a vocal ecology in general, and for specification of ecological agency in particular, are consonant with Eric Clarke's work on the ecology of listening, and extend it to account for composition and performance.¹⁵ Drawing on James J. Gibson's ecological psychology, Clarke argues that musical sound, like all other objects and events in our environment, afford the listener opportunities and meaning, especially opportunities for action, that arise both from the properties of the objects and events and our capacities and needs. Clarke writes,

When humans and other animals perceive the world, they do so actively. Perception is essentially exploratory, seeking out sources of stimulation in order to discover more about the environment. This operates in so many ways and so continuously that it is easy to overlook: we detect a sound and turn to it; we catch sight of an object, turn our eyes to it, lean forward and reach out to touch it; we get a whiff of something and deliberately breathe in through the nose to get a better sense of its smell. These and countless other examples illustrate the constant orienting of the organism to its environment, the constant search to optimize and explore the source of stimulation. Actions lead to, enhance, and direct

¹¹ *Ibid.*, 345.

¹² Marion Guck, “Two Types of Metaphoric Transference,” in *Music and Meaning*, ed. Jenefer Robinson (Ithaca, NY: Cornell University Press, 1997), 203.

¹³ The aurochs (*Bos primigenius*) is an extinct species of wild cattle. On the efficaciousness of the maternal voice and its relation to music, see Ellen Dissanayake, “Antecedents of the Temporal Arts in Early Mother-Infant Interaction,” in *The Origins of Music*, ed. Nils L. Wallin, Björn Merker, and Steven Brown (Cambridge, MA: MIT Press, 2000), 389–410; and Maya Gratier and Gisèle Apter-Danon, “The Improvised Musicality of Belonging: Repetition and Variation in Mother-Infant Vocal Interaction,” in *Communicative Musicality: Exploring the Basis of Human Companionship*, ed. Stephen Malloch and Colwyn Trevarthen (Oxford: Oxford University Press, 2009), 301–27.

¹⁴ Transparency is ideologically problematic, as Tomlinson points out (“Vico's Songs,” 344). On the roles of metaphor in concept formation for music, see Lawrence M. Zbikowski, *Conceptualizing Music: Cognitive Structure, Theory, and Analysis* (Oxford: Oxford University Press, 2002), 65–77.

¹⁵ Eric Clarke, *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning* (Oxford: Oxford University Press, 2005). Clarke writes that his study of listening is “no more than a part of a larger project on the enactment of musical meaning,” but also notes that the apparent passivity of listening is an illusion (*ibid.*, 205; italics original).

perception, and are in turn the result of, and response to, perception. Resonance is not passive: it is a perceiving organism's active exploratory engagement with its environment.¹⁶

Clarke is interested in the experience of the enculturated listener to Western music, for whom functions or actions tend towards, as Clarke puts it, "different varieties of more or less concealed or sublimated active engagement" during apparently passive attention.¹⁷ But the "general ecological principle of reciprocity of perception and action," the idea that organism and environment resonate with each other, still stands.¹⁸

Thus the active responses of an organism to the objects and events in its environment are *themselves* objects and events in the environment, reciprocally affording meaning and opportunities for action to other organisms, and crucially, simultaneously affording the acting organism agency in its environment.¹⁹ It is from this perspective that I shall interpret the voices in Crumb's song to be enacting claims of presence and agency in the nocturnal soundscape.

My ecological approach necessarily entails attention to the relationship between human expression and the natural environment, and in this way I share principles and perspectives with the work gathered recently under the heading "ecomusicology," but with some important differences. Introducing a recent colloquy in the *Journal of the American Musicological Society*, Aaron Allen asks six fundamental questions that ecomusicology, or ecocritical musicology, must answer.²⁰ Five of these have to do with the role the discipline can or should play in thinking about human impact on the environment. These are important questions, but not ones to which I address this article. A sixth question is, "how does nature inform music, and what can the study of music tell us about humans, other species, the built environment, the natural world, constructed 'nature,' and their connections?" I would begin the question differently: "How is music natural, or 'of nature'?" The difference between Allen's formulation and mine lies in the relationship between music as part of cultural discourse that may contemplate Nature and music as *natural*, as part of a suite of human acoustic behaviors—and I include listening as well as making in these behaviors.²¹ Papers by Denise Von Glahn and Daniel Grimley in the same colloquy illustrate my point.

Von Glahn asks, "[W]hose place has been described in the nature-conquering narratives [expressive of Americanness]; how has the nation been characterized

¹⁶ Ibid., 19.

¹⁷ Ibid., 205.

¹⁸ Ibid., 204.

¹⁹ The verb *to afford* will resonate with readers familiar with ecological psychology, where the noun form *affordance* was coined by Gibson to mean "what things [in the environment] furnish, for good or ill" as a basis for response by the perceiving organism (Gibson, *The Senses*, 285). Gibson's full explanation, along with his discussion of acoustic stimuli (ibid., 16–17), are consonant with my usage here.

²⁰ Aaron S. Allen, "Ecomusicology: Ecocriticism and Musicology," *Journal of the American Musicological Society* 64/2 (2011): 392.

²¹ By "Nature" with an uppercase "n" I mean historical and cultural concepts of the natural world, understood to be separate and in some ways unknowable by human beings. By "nature" with a lowercase "n" I mean the whole of biological, geological, and meteorological organisms, materials, and forces that constitute the environment in which all organisms live.

and by what authority; whose identity has been foregrounded?"²² In answer she outlines a project that studies works composed by women that reflect a "time- and place-specific understanding of nature" and "express societal values regarding relationships between humans and nonhuman others."²³ Here and elsewhere, Von Glahn's project explores the place of Nature in American cultural discourse, rather than music *as natural*.²⁴

Grimley considers the effects of Sibelius's *Tapiola* as a land/soundscape in which the listener is situated and to which the listener is attuned, as one is, to some degree, always situated in and attuned to one's surroundings.²⁵ Although Grimley notes how *Tapiola* "belongs within an established cultural tradition . . . of the forest as a mysterious twilight domain of primitive folk custom and ritual sacrifice,"²⁶ that is, a well-established theme in cultural discourse, he is more concerned with the ways the piece creates a soundscape in which the listener is immersed in the same way a perceiving organism is immersed in the light, sound, wind, and ground of a natural landscape.

My concerns here are more like Grimley's than Von Glahn's, but that does not mean I value one strain of ecologically aware musicology more than the other. Both are necessary modes of inquiry. Rather, a number of Crumb's compositions, "El niño" being a brief and particularly manageable one among them, raise for me not only questions about Nature represented in music, but specifically what it means to have a voice, to use it, and to be heard in the world. Put another way, how are human behaviors that Western scholars recognize as musical akin to acoustic behaviors of other organisms?

Other works by Crumb, in one way or another, are ecological in the sense I mean. I have elsewhere traced in *Apparition* (1979), a song cycle on texts by Walt Whitman, the way the voice of the hermit thrush, as Whitman writes of it in "When Lilacs Last in the Dooryard Bloom'd," is heard first as itself—an elusive nocturnal bird—and then gradually as a voice that sings to and with the poet in mourning for the death of Abraham Lincoln.²⁷ *An Idyll for the Misbegotten* (1985), for flute and percussion, is explicitly about environmental degradation and is meant to evoke the "voice of nature."²⁸ For much of the piece, this voice (in the flute) is birdsong-like, and will have the effect Crumb intends if played "from afar, over a lake, on a moonlight evening in August."²⁹ The flute-bird would be mostly audible in such a setting, depending on wind, tree cover, and distance, but the percussion parts

²² Denise Von Glahn, "American Women and the Nature of Identity," *Journal of the American Musicological Society* 64/2 (2011): 401.

²³ *Ibid.*, 403.

²⁴ See also Von Glahn, *The Sounds of Place: Music and the American Cultural Landscape* (Boston: Northeastern University Press, 2003).

²⁵ Daniel M. Grimley, "Music, Landscape, Attunement: Listening to Sibelius's *Tapiola*," *Journal of the American Musicological Society* 64/2 (2011): 394–98.

²⁶ *Ibid.*, 396–97.

²⁷ Robert C. Cook, "Crumb's *Apparition* and Emerson's Compensation," *Music Theory Spectrum* 34/2 (2012): 1–25.

²⁸ George Crumb, *An Idyll for the Misbegotten* (New York: C. F. Peters, 1986), [3].

²⁹ *Ibid.*

would only occasionally be prominent enough to identify their sources. The tam-tam would be heard as no more than an ominous rumble, too distant to identify but too present to completely dismiss as “background,” indistinguishable from the omnipresent rumble of noise generated by the mechanisms of human culture that are the instruments of what Crumb calls our illegitimacy as “monarchs of a dying world.”³⁰ *Vox Balanae* was inspired, according to Crumb, by recordings of humpback whales first made available in in the early 1970s. Rather than directly represent the sounds of whale song, the piece evokes the vast time and distances across which whales sing and alter their songs. Crumb says, “The range was the first thing that impressed me . . . from the pedal tones of the organ to sounds that go way beyond the limit of human hearing. A sense of musical phrase, an incredible composition that was going on, majestic, huge phrases.”³¹ The scale on which humpbacks sing and compose is indeed vast: the whales change their songs slowly, singing variations on phrases over the course of years until songs are almost completely new.³² All of these works are considerably more complex than “El niño.” Because of its brevity, however, “El niño” is an ideal ecosystem in which to begin to understand song as acoustic agency in a soundscape.

Lorca’s poem

Crumb’s text for “El niño” is drawn from Lorca’s poem, “El niño mudo” (“The Voiceless Child”), published in the *Canciones* of 1927. The two stanzas used by Crumb are in boldface.

**El niño busca su voz.
(La tenía el rey de los grillos.)
En una gota de agua
buscaba su voz el niño.**

**No la quiero para hablar;
me haré con ella un anillo
que llevará mi silencio
en su dedo pequeñito.**

En una gota de agua
buscaba su voz el niño.

(La voz cautiva, a lo lejos,
se ponía un traje de grillo.)

The front matter of the score provides a translation by W. S. Merwin of the two stanzas set in the song:

The little boy was looking for his voice.
(The king of the crickets had it.)

³⁰ Ibid. I have discussed how nature’s voice speaks in *Idyll* in Cook, “Hearing Ecological Voices: Music and Communication of Environmental Crisis,” unpublished paper delivered at the International Conference on Culture, Politics, and Climate Change, Boulder, Colorado, 14 September 2012.

³¹ Quoted in David Rothenberg, *Thousand Mile Song: Whale Music in a Sea of Sound* (New York: Basic Books, 2008), 32.

³² Katharine Payne and Roger Payne, “Large Scale Changes over 19 Years in Songs of Humpback Whales in Bermuda,” *Zeitschrift für Tierpsychologie* 68/2 (1985): 89–114; Linda N. Guinee and Katharine B. Payne, “Rhyme-Like Repetitions in Songs of Humpback Whales,” *Ethology* 79/4 (1988): 295–306.

In a drop of water
 the little boy was looking for his voice.
 I do not want it for speaking with;
 I will make a ring of it
 so that he may wear my silence
 on his little finger.

The text tells of ownership of the voice, of possessing vocal agency. The cricket king has the boy's voice; the boy asks for it back, but only so that he can fashion it into a ring—an emblem of ownership—for the cricket king to wear.

Lorca's poem has more to say about possession of the voice. Here is a more recent translation by Alan S. Trueblood, given complete:

The child goes seeking his voice.
 (The king of the crickets had it.)
 In a drop of water
 the child sought his voice.
 Not that I want it to talk with;
 I'll turn it into a ring
 for my silence to wear
 on its little finger.
 In a drop of water
 the child sought his voice.
 (Far off, the captive voice
 was dressing in cricket's clothes.)³³

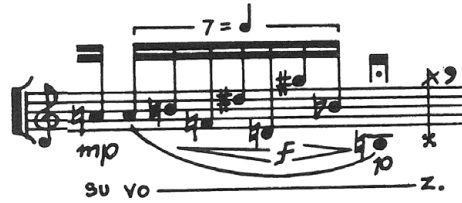
The first of the additional couplets repeats the second couplet of the first stanza; the last couplet of the poem portrays the voice, captive though it is, as an agent. The cricket does not wear the voice; rather, the voice puts on cricket clothes, becomes cricket-like.

Merwin's and Trueblood's translations of the second stanza differ on the identity of he who will wear the ring. Merwin's "so that he may wear my silence / on his little finger" refers to the cricket king. Trueblood's "for my silence to wear / on its little finger" personifies the boy's silence and gives it the ring. We can reconcile the difference through an appeal to the vocal ecology of the soundscape we share with crickets. They chirp only when we are silent and still. A chirping cricket *is*, in this sense, a human being's silence. We shall return to this matter below.

Crumb's *voz*

Lorca's poem tells of the voice; likewise, Crumb's song centers on a voice, or more precisely, *voz*, the figure shown in Example 1a. In a song replete with displays of the vocal tract's abilities to make not just pitches but sounds that specify a vocalizing organism, *voz* is remarkable for its presentation of the voice as more of a musical instrument than a quivering of a singer's throat and for registering conventions of compound melody and motivic development. Nevertheless, *voz* is

³³ Federico García Lorca, *Collected Poems: A Bilingual Edition*, ed. Christopher Maurer, 2nd ed. (New York: Farrar, Straus and Giroux, 2002), 514 [515].



Example 1. “El niño,” © 1970 by C. F. Peters Corporation. Used by permission. a. 1.6, *voz* figure.

Example 1b. “El niño,” 1.6, motivic process in *voz*.

a voice; it opens its mouth and speaks, expands, from a registrally neutral A4.³⁴ We will explore this opening and its sequel note by note as a first step toward understanding how the song portrays sounds becoming meaningful utterances of a voice. In the analysis below, I model this process as a pitch- and pitch-class-motivic one, first deriving *voz* from smaller motives in the opening vocalise (1.1–1.2), and then showing how the rest of the song plays with and elaborates what has come before. I write “plays with” intentionally, because the remainder of the A section manipulates the original motives and their combinations in ways that are less developmental (in the traditional musicological sense of teleological and implicitly hierarchical alteration and recombination) than they are casual and exploratory. The curious, playful character that emerges in the analysis is consonant with the interpretation of Lorca’s text, in which the cricket king tries out the boy’s voice, beginning with a few trial sounds, and eventually learning how to speak fluently. Analyses of music and text together thus support the claim that, in portraying the problem of interspecies vocal agency in the soundscape, “El niño” enacts the ecology of the nocturnal soundscape humans and crickets—and indeed many other organisms—share.

Example 1b, from the B section narration (1.6), shows how the first three pitches of *voz* begin to open registral space and form a trichord of class [0, 2, 6]. The fourth

³⁴ I say “registrally neutral” because this octave just above C4 is, due largely to the piano, a default register, a “middle” neither high nor low. It is where we imagine melodic utterances to begin.

Example 1c. “El niño,” 1.6, narration, first stanza, second line.

pitch, D \sharp 5, makes a second [0, 2, 6], {A, B, D \sharp }, the inversion about B \flat 4 of the first, and in so doing, suggests that *voz* articulates a counterpoint about that axis. Together, the trichords make a tetrachord of class [0, 2, 6, 8]. The fifth pitch, D4, does not make an [0, 2, 6], but seems to continue the inversive counterpoint of the compound melody, and would do so, were it followed by F \sharp 5. But *voz* is a voice, and it now “speaks out,” as it were, with G \sharp 5, exceeding the boundaries of the apparent motivic-transformational path.³⁵ The seventh pitch, B \flat 4, reengages *voz* with the motivic process, both making the earlier axis of inversion explicit and fixing D and G \sharp in a third [0, 2, 6]. The eighth pitch of *voz*, B3, neither adds a new pitch class nor makes a new [0, 2, 6]. Perhaps it leaves open the possibility of A5, its inversive sibling about B \flat 4, but A5 is never sung or played in the song.

By contrast, the parenthetical explanation for the boy’s search—that the cricket king has the voice—closes *voz*’s mouth, contracts its registral space, and abandons—or at least changes—the motivic process. This passage appears on the right side of Example 1c, following *voz*. Crumb’s metrical notation and the sequential descent in register suggest trichords of class [0, 1, 4], a sonority otherwise not salient in the song. Coming immediately after *voz* with its contrapuntal, register-opening effect, however, the rests and staccato articulation encourage a hearing in which three voices, outlined by arpeggiated [0, 1, 4] chords, converge on F \sharp 4. These three descending lines are as follows: the top line, (D \sharp , C \sharp , B), and bottom line, (E, D, C) descend through trichords of class [0, 2, 4]; the middle line, (B \sharp , A \sharp , G \sharp , F \sharp), descends through a tetrachord of class [0, 2, 4, 6].

We can connect this part of the passage—the closing of *voz*’s mouth—to *voz* itself if we hear F \sharp 4 completing both the bottom line as well as middle, the last sound before the mouth closes. Example 1d shows how. With F \sharp , the bottom line is also

³⁵ D4 is the first pitch in *voz* that belongs to no [0, 2, 6]. Attention drawn by its lack of a clear motivic relation is quickly redirected to G \sharp 5, to which the soprano makes a *crescendo*. Thus, it is not so much D4 itself that is remarkable but the divergence from the inversive counterpoint, marked by G \sharp 5, immediately after the D that gives D4 prominence.

Example 1d. “El niño,” 1.6, narration, first stanza, second line, alternative interpretation.

Example 2. “El niño,” 2.1, “after-song,” closing measures. © 1970 by C. F. Peters Corporation. Used by permission.

an $[0, 2, 4, 6]$. With A4 the pitch on which the lost *voz* begins, the *top* line is also a descending $[0, 2, 4, 6]$.³⁶

We hear *voz* two other times in the song. One of these is in the boy soprano’s “after-song,” as Crumb labels the closing passage of the B section. Example 2 shows the final measures of the passage (2.1). Abbreviated and reordered, *voz* in the last measure of “El niño” is little more than a whimper; it has become a ring for the cricket king, the boy’s silence personified, to wear “en su dedo pequeño,” on his little finger. On the hand of the cricket, though, in the penultimate measure, the D4 of *voz* finds a new and clearly articulated $[0, 2, 6]$: $\{D, F\sharp, G\sharp\}$, a setting it was missing in the earlier statement. In the boy’s silence—“mi silencio,” he sings—what is left of his *voz* speaks of that silence, while the cricket gives *voz* new voice.

The other time we hear *voz* is at the close of Vocalise 1 (1.1–1.2), shown in Example 3. We do not yet recognize it as *voz*, though we might recognize it as voice, as sound uttered by someone. We might so recognize it because of the way it emerges out of the soprano’s vocal calisthenics, marked “free and fantastic” by Crumb.

The vocalise—and the song—begins with three kinds of phoneme, the fundamental sound of which human utterances are formed: a tongue click, reminiscent of the clicks that are present in few languages now outside of southern Africa,

³⁶ Each $[0, 2, 4, 6]$ embeds two $[0, 2, 6]$ trichords, of course, but the creative speech of *voz* through which they were made is mute here, and they do not emerge in this figure.

Example 3. “El niño,” 1.1-1.2, Vocalise 1. © 1970 by C. F. Peters Corporation. Used by permission.

“mm,” and vowels.³⁷ The soprano sings the vowels in a steadily accelerating and decelerating tremolo. There is no reason, yet, to hear the figure as the sound of something other than a C♯ articulated simultaneously *accelerando-ritardando* and *crescendo-descrescendo*. But the rapid vowel oscillation of this figure and others like it resemble, in notation and aural effect, the “cricket sound” performed later by the percussionists.

From these beginnings, sung entirely on C♯5, emerge the first syllables and the first pitch motives of the piece. An [0, 2, 6] figure settles again on C♯5, and then a second [0, 2, 6] figure, an inversion of the first about D, settles on D♯5, from which the soprano once again sings the cricket-like vowel tremolo. Together, the figures make an [0, 2, 6, 8] tetrachord, {G, A, C♯, D♯}. After a three-second pause, the soprano sings a new figure that includes one of the previous [0, 2, 6] trichords, and adds two new pitches, F♯5 and G♯5. These new notes make no [0, 2, 6] with any others yet sung. Perhaps they open the way to new versions of the trichord; if so, we should expect C, D, or both.

The soprano sings this new figure twice. In the first version of the figure, she sings only the syllable “ka-” followed by “mm.” In the second version, she sings a vowel cycle like those of the earlier cricket-like tremolos.³⁸ Then, “elegantly,” as Crumb’s marking reads, the soprano sings the figure we will come to recognize as *voz*.

The emergence of *voz* in the first vocalise is both a motivic process and a narrative one. As the preceding analysis shows, *voz* emerges motivically from the first gestures of the song to which Crumb sets the vowel-cycle tremolos. But for the initial “k-” the soprano also sings vowels to *voz*. But these are not the vowel cycles of before; just as the *voz* figure expands the motivic process begun earlier in the vocalise, the vowel series set to the *voz* figure breaks out of the cycles sung earlier. All of this vocalizing has become a *voice*.

³⁷ Recent scholarship strongly suggests African origins for modern human languages. See Quentin D. Atkinson, “Phonemic Diversity Supports a Serial Founder Effect Model of Language Expansion from Africa,” *Science* 332/6027 (2011): 346–49. There is no evidence that Crumb intends a reference to Africa in “El niño.” The notion of a tongue click as a “first sound of speech” is my own.

³⁸ Each figure is also followed by a hummed gesture. The first hummed gesture recalls the opening material with the [0, 2, 6] trichords {G, A, C♯}, and the second combines all of the pitches heard so far in the song.

Example 4. “El niño,” © 1970 by C. F. Peters Corporation. Used by permission. a. 1.2, Interlude 1 and beginning of Vocalise 1.

[0, 2, 6, 8]
 T_{11} of {G, A, C#, D#} in Vocalise 1

Example 4b. “El niño,” 1.3, Vocalise 2, laughing figure.

Voz emerges narratively as the cricket tries out its new voice. At first, it can manage only a few phonemes, and these in the cricket’s native pulsing thrum. Shortly, though, the cricket manages syllables and melodic figures, and soon after, notes that foretell new figures. It is then that we hear voz.

The cricket, or the voice in cricket guise, can now speak; it can create new utterances, and it takes pleasure in the new skill. Recall that the {F#, G#} dyad in Vocalise 1 called for D, C, or both, to make [0, 2, 6] trichords or an [0, 2, 6, 8] tetrachord. The dyad returns in the following Interlude 1 (1.2), played on the amplified piano. Example 4a shows Interlude 1 and the beginning of Vocalise 2, which the soprano begins with a figure emphasizing D4. After pausing there, she sings a rising figure, shown in Example 4b, that makes good on the promise of the {F#, G#} dyad and joins it with D. As the figure rises, it passes through C5 and D5, making an [0, 2, 6, 8] tetrachord related by T_{11} to the tetrachord in the first vocalise. And just as the first vocalise then moved beyond its initial tetrachord, so this figure moves beyond its tetrachord, adding F5. I claimed that the cricket—or the voice—is pleased by its newfound capability for speech. I say so because, here, it laughs, “ha-ha-ha!” Or better, it giggles with delight, as a child might when discovering a new skill. This is truly a child’s voice.

T_3
 first [0, 2, 6, 8] → [0, 2, 6, 8] figure in which upper and lower
 in Vocalise 1 + F# F# first appeared registral boundaries

Example 5. “El niño,” 1.3, Vocalise 2. © 1970 by C. F. Peters Corporation. Used by permission.

Example 6. “El niño,” 1.5, Vocalise 3, laughing figure. © 1970 by C. F. Peters Corporation. Used by permission.

After this realization, motivic development and use of register are more confident, as Example 5 shows. The next figure rehearses the first [0, 2, 6, 8] tetrachord from Vocalise 1 and its first extension to F# \sharp , then from this F# \sharp makes a new tetrachord related to the original by T_3 . Then the soprano sings the very figure in which F# \sharp first appeared. The cricket—or the voice—can not only create new utterances, it can tell a story about how what now is came to be out of what was.

Vocalise 2 closes with a thrumming “wa-wa” tremolo, different from the earlier vowel cycle tremolos but nevertheless similar enough to recall the cricket’s earlier efforts with its new voice. But now, the tremolo marks the upper and lower registers of the captured and acclimated voice. Eb5 is enharmonically equivalent to the D#5 on which the voice last sang the tremolo—the pitch, that is, on which the voice last sang in a cricket’s manner—and D4 is the pitch after which *voz* began to open up and the capacity for speech emerged.

A detailed account of Vocalise 3 is unnecessary here. It continues development of figures that emerge in Vocalises 1 and 2, as if the cricket is in full human voice and relishing it. However, near the end of Vocalise 3 (1.5), and therefore of the song’s A section, the cricket laughs again, this time in a great two-octave-plus-a-semitone sweep across and exceeding the range of *voz*; indeed, exceeding the range of any passage in the song. The figure appears in Example 6. From self-conscious giggle to hearty cackle, the A section depicts the cricket’s possession of voice and agency in the song’s soundscape.

The B section of “El niño” opens with the first use of Lorca’s text (1.6). The speaker is a third voice, neither the cricket nor the boy, but a narrator. We studied the end of this passage in Examples 1a–c above, and the beginning, shown in Example 7, now looks familiar. The setting of “El niño” (the first phrase of text, not the song’s title) is the [0, 2, 6, 8] tetrachord from Vocalise 1, this time with an

from Vocalise 1

recalls

first [0, 2, 6, 8]
in Vocalise 1
+ A \sharp

Example 7. “El niño,” 1.6, narration, first stanza, first line. © 1970 by C. F. Peters Corporation. Used by permission.

added A \sharp . We have heard enough by now to connect A \sharp , and the repeated [0, 2, 5] trichord it makes with D \sharp and C \sharp , to another figure with which we are familiar: the figure in which the soprano first sang F \sharp and G \sharp (1.1). Were the present figure to include G \sharp , it would be a transposition of the earlier one without its A.

The soprano’s narration fades into a whisper, and it is safe for the cricket king and his subjects to sing again, this time in their own voices (1.6–2.1). The first part of the passage (1.6) appears in Example 8a. But they, too, must break off into a whisper and then silence, because the boy himself speaks (2.1), as shown in Example 8b. This is hardly his own voice. The boy sings, “No la quiero para hablar,” (I don’t want it to speak with), but he uses the *narrator’s* voice: the pitch classes are those to which the soprano sang “El niño busca su voz,” but without G. He then sings “me hare con ella un anillo,” beginning with the very collection alluded to by the soprano when she sang “niño” in the narration that began the B section (see the left side of Example 6). When the boy names the ring, “anillo,” into which he would make his stolen voice, he speaks for the first time in something like his voice—something like *voz*—continuing into the next phrase to make a familiar [0, 2, 6, 8] tetrachord. This is *not* the original {G, A, C \sharp , D \sharp } tetrachord, however. Rather, it is {F \sharp , G \sharp , C, D}, the one in which the cricket giggled upon realizing the agency of *voz*.

After this, as we saw in Example 2, the boy can just barely speak.

Vocal ecology

The boy has thus yielded the voice and agency in the soundscape to the cricket. If the boy speaks at the end of “El niño,” it is in the voice that for now belongs more to the cricket king. It is a curious thing to attribute vocal agency, or agency of any sort, to

The image shows a musical score for three percussion parts, labeled Perc. I, Perc. II, and Perc. III. Each part is written on a grand staff with a treble clef and a common time signature. The score includes several layers of sound:

- Cricket Sound (whisper):** Represented by a series of asterisks (*) on a staff, with a dynamic marking of *fz* (forzando).
- Tam-tam (Scrape):** Represented by a series of asterisks (*) on a staff, with a dynamic marking of *fz*.
- Vocalizations:** A series of 'i-u-i-u-i-u-i-u-i-u-i-u-i-u-i-u' notes on a staff, with a dynamic marking of *fz*.
- Other sounds:** A series of 'ZZ' notes on a staff, with a dynamic marking of *fz*.

 The score is divided into three sections, each with a dynamic marking of *fz* and a tempo marking of *poco*. The sections are labeled Perc. I, Perc. II, and Perc. III. The score is written in a style that suggests a complex, layered texture of sounds.

Example 8. “El niño,” © 1970 by C. F. Peters Corporation. Used by permission. a. 1.6, cricket sounds.

a cricket. We push cricket sounds into the background of our soundscape such that they can represent silence and emptiness—witness the playback of recorded cricket sounds to underscore lack of audience response to a comedian’s joke. But the cricket sound then really represents the absence of *human* sound: the crickets’ “silence” becomes an overwhelming chorus—the voiceless taking voice, background noise becoming song. (Of course, only humans invest our interaction with crickets with meaning; for the crickets, as far as we know, both singing and being silent are simply matters of survival.)

Imagine wandering into a yard or field well after dark on a warm night. When you move or call, crickets in the area cease chirping, the response being more pronounced the nearer you are to the insects and the lower the vibrations you transmit through the ground.³⁹ So long as you are silent and motionless, however, crickets will chirp, sometimes so loudly and in such great numbers that not only can you hear little else clearly, you could not discern the location of a single cricket. Thus, crickets may interfere with our ability to assess the soundscape and thus our ability to exercise acoustic agency, such as our own social vocalizations that have intimate evolutionary ties to our responses to music.⁴⁰ Likewise, exercise of

³⁹ Experiments in which three-kilogram iron balls were dropped in the vicinity of chirping crickets demonstrated that stimuli within three meters and with vibrations below 400 Hz silenced all chirping. See Martin Dambach, “Vibrational Responses,” in *Cricket Behavior and Neurobiology*, ed. Franz Huber, Thomas E. Moore, and Werner Loher (Ithaca, NY: Cornell University Press, 1989), 180–83.

⁴⁰ Experimental results synthesized by Jaak Panksepp and Colwyn Trevarthen suggest that when music induces “chills” it has stimulated the systems of the brain that deal with separation distress. See

The image displays a musical score for 'El niño' from Act 2, Scene 1. It features a vocal line for a Boy Soprano (offstage) and a percussion accompaniment. The vocal line includes lyrics: "No la quie-ro para ha-blar; me ha-re con e-lla un a-ni-llo que lle-vará mi si-len-cio en su de-do pe-que-ño-to." Above the vocal line, three specific melodic phrases are circled and labeled with pitch classes: [0, 2, 5], [0, 2, 5, 7], and [0, 2, 6, 8]. Arrows labeled "recalls" point from these phrases to corresponding phrases in the percussion accompaniment. The percussion part is divided into three staves (I, II, III) and includes instructions like "speak", "Tam-t. (soft beater)", and "i-u". Analytical notes include "[d = d sempre]", "[d = 30]", and "N.B. The boy's 'after-song' should sound very remote. The style of singing should be simple and unaffected, even naive." A final melodic phrase is circled and labeled "[0, 2, 6, 8]".

Example 8b. "El niño," 2.1, end of cricket sounds and "after-song."

ecological agency, acoustic or physical, by human beings interferes with cricket communication. Male crickets—females do not chirp—produce sound by rubbing files on the undersurface of one wing with a plectrum on the top of the other, the vibrations of which excite resonators in the wings. The dominant, or carrier, frequency of the resonators and the frequency of the wingbeat pulses differ by species, and female crickets display phonotaxis, or motion toward a sound source. The female cricket's job is complicated by two factors. First, she must use the males' calls alone to locate a suitable mate. Evidence suggests that she moves toward calls that feature a dominant frequency and pulse typical for her species. The problem is that species of other crickets may be present and chirping, and the cost of choosing the wrong mate is high. The second complication is the acoustic presence of yet *other* species—insects whose calls occupy similar regions of the frequency spectrum, bats whose echolocation signals can evidently be discerned by crickets if they are not acoustically masked, birds, and humans—and other sound sources, especially mechanical anthropogenic sounds.⁴¹ Crickets must be still and silent to avoid predators; but they must chirp and move, and just as importantly, hear clearly to survive. The less we exercise agency in the soundscape, the more the crickets can do so.

Ecology and song

The problem of vocal agency is not only ecological, it is also cultural, as Tomlinson's account of song suggests. As pitched vocal behavior—song—was disciplined into music, it was stripped—at least outwardly—of its efficaciousness. First, efficacy was linked to pitch collections, pitch patterns, and rhythmic figures and then classified by mode (themselves a disciplining of melodic practice). Later, musical effects were ordered and explained according to categories received from classical rhetoric. Along the way these classifications became perfunctory, and music's power to summon spirits, influence natural phenomena, and so on was demonized or

Panksepp and Trevarthen, "The Neuroscience of Emotion in Music," in *Communicative Musicality: Exploring the Basis of Human Companionship*, ed. Stephen Malloch and Colwyn Trevarthen (Oxford: Oxford University Press, 2009), 123–25. In the same volume, Ellen Dissanayake, "Root, Leaf, Blossom, or Bole: Concerning the Origin and Adaptive Function of Music," 22–26, and Ian Cross and Iain Morley, "The Evolution of Music: Theories, Definitions and the Nature of the Evidence," 62–64, find evidence that musical activity bonds mother-infant pairs, promotes recognition of individuals and group cohesion, and moderates group anxiety. See also Jaak Panksepp and Günther Bernatzky, "Emotional Sounds and the Brain: the Neuro-Affective Foundations of Musical Appreciation," *Behavioural Processes* 60/2 (2002): 139–40.

⁴¹ *Cricket Behavior* includes useful, if technical, summaries of research on cricket song and hearing. On cricket song production, see Henry C. Bennet-Clark, "Songs and the Physics of Sound Production," 227–42. On phonotaxis by females, Theo Weber and John Thorson, "Phonotactic Behavior of Walking Crickets," 316–20; and Gerald S. Pollack and Ronald R. Hoy, "Evasive Acoustic Behavior and Its Neurological Basis," 341–50. The problem of soundscape saturation, particularly because of anthropogenic sound, has been fruitfully addressed in research investigating the "niche hypothesis" proposed in Bernie L. Krause, "Bioacoustics, Habitat Ambience in Ecological Balance," *Whole Earth Review* 57 (1987): 14–18. Though addressed to bird rather than insect behavior, a foundational article for experimental evidence of acoustic niches and human impact on them is Hans Slabbekoorn and Margriet Peet, "Birds Sing at a Higher Pitch in Urban Noise," *Nature* 424/267 (July 2003): 267.

dismissed. Likewise, the vocal behavior we call song was divorced from some of its ecological and biological purposes: to announce territory, to warn off competing creatures and predators, to express to other organisms the singer's physical self-awareness.

Crumb's song challenges us to recognize these properties in music anew. Of course, from a performer's practical point of view, Crumb's use of timbre is simply imitative: the soprano soloist and percussionists performing *Ancient Voices* must think about how to make their voices sound "like crickets." In the foregoing interpretation, however, Crumb's "El niño busca su voz" is not merely a song that imitates cricket sounds for effect. Like the Child in Malouf's tale, musicians performing *Ancient Voices* make concerted human and cricket sound, an enacting of the vocal ecology in which we and other creatures share.

In an attempt to show that poetry is best understood ecologically (in precisely the way I am using the term) Canadian poet and typographer Robert Bringhurst quotes Simone Weil on language and art as, ultimately, acts of compassionate subjectivity. Weil wrote, "Their function is to testify, after the fashion of apple trees in bloom, of stars."⁴² Bringhurst goes on:

Aristotle called this process *μίμησις* [mīmēsis]. This has been translated as "imitation," but *participation* would be closer. It is imitation in the culturally significant sense of the word: the sense in which children imitate their elders and apprentices their masters. *Μίμησις* means *learning by doing*. And words, Weil reminds us, are not just poker chips that are used for passing judgements or passing exams. Words are the tracks left by the breath of the mind as it intersects with the breath of the lungs.⁴³

That is, utterances are not merely tokens; they are physical and efficacious. They are the sounds of someone, or something. Likewise, the distinctive timbral characters in Crumb's music are neither music-literal acoustic tokens nor tone-painterly effects nor mere imitation, but notices of self and agency: a cricket speaks, a boy whimpers. Crumb's music implicitly asks, how and what does song express for the individual who sings—regardless of species? In what way may we once again acknowledge that human musics are songish?

References

Allen, Aaron S. "Ecomusicology: Ecocriticism and Musicology." *Journal of the American Musicological Society* 64/2 (2011): 391–94.

⁴² Weil, *Cahiers*, vol. 3 (Paris: Plon, 1956), 56. I have slightly modified Bringhurst's translation. Weil is writing about God's desire to find and enter into humans, and says that God can only capture the soul through the senses, by means of the beauties of Nature and sensible signs (*les signes sensibles*) of poetry, art, and human action. She then likens these to natural things, and says that the poet makes the Beautiful by attending to the Real, and that this is the same as an act of love, in the sense of subjectivity—one recognizes the humanity in another, especially one in need (57–58). One might find resonances in Crumb's setting of "El niño" with Weil's perspective, but for a closer fit, read Weil beside the program note in the published score of Crumb's *Idyll for the Misbegotten*.

⁴³ Robert Bringhurst, *The Tree of Meaning: Language, Mind and Ecology* (Berkeley, CA: Counterpoint, 2008), 144.

- Atkinson, Quentin D. "Phonemic Diversity Supports a Serial Founder Effect Model of Language Expansion from Africa." *Science* 332/6027 (2011): 346–49.
- Bennet-Clark, Henry C. "Songs and the Physics of Sound Production." In *Cricket Behavior and Neurobiology*, ed. Franz Huber, Thomas E. Moore, and Werner Loher, 227–42. Ithaca, NY: Cornell University Press, 1989.
- Bringhurst, Robert. *The Tree of Meaning: Language, Mind and Ecology*. Berkeley, CA: Counterpoint, 2008.
- Clarke, Eric F. *Ways of Listening: An Ecological Approach to the Perception of Musical Meaning*. Oxford: Oxford University Press, 2005.
- Cook, Robert C. "Hearing Ecological Voices: Music and Communication of Environmental Crisis." Unpublished paper delivered at the International Conference on Culture, Politics, and Climate Change, Boulder, CO, 14 September 2012.
- . "Crumb's *Apparition* and Emerson's Compensation." *Music Theory Spectrum* 34/2 (2012): 1–25.
- Cross, Ian, and Iain Morley. "The Evolution of Music: Theories, Definitions and the Nature of the Evidence." In *Communicative Musicality: Exploring the Basis of Human Companionship*, ed. Stephen Malloch and Colwyn Trevarthen, 61–81. Oxford: Oxford University Press, 2009.
- Crumb, George. *Ancient Voices of Children*. New York: C. F. Peters, 1970.
- Dambach, Martin. "Vibrational Responses." In *Cricket Behavior and Neurobiology*, ed. Franz Huber, Thomas E. Moore, and Werner Loher, 178–97. Ithaca, NY: Cornell University Press, 1989.
- Dissanayake, Ellen. "Antecedents of the Temporal Arts in Early Mother-Infant Interaction." In *The Origins of Music*, ed. Nils L. Wallin, Björn Merker, and Steven Brown, 389–410. Cambridge, MA: MIT Press, 2000.
- . "Root, Leaf, Blossom, or Bole: Concerning the Origin and Adaptive Function of Music." In *Communicative Musicality: Exploring the Basis of Human Companionship*, ed. Stephen Malloch and Colwyn Trevarthen, 17–30. Oxford: Oxford University Press, 2009.
- Gibson, James J. *The Senses Considered as Perceptual Systems*. Boston: Houghton Mifflin, 1966.
- Gratier, Maya, and Giséle Apter-Danon. "The Improvised Musicality of Belonging: Repetition and Variation in Mother-Infant Vocal Interaction." In *Communicative Musicality: Exploring the Basis of Human Companionship*, ed. Stephen Malloch and Colwyn Trevarthen, 301–27. Oxford: Oxford University Press, 2009.
- Grimley, Daniel M. "Music, Landscape, Attunement: Listening to Sibelius's *Tapiola*." *Journal of the American Musicological Society* 64/2 *American Musicological Society* 64 (2011): 394–98.
- Guck, Marion A. "Two Types of Metaphoric Transference." In *Music and Meaning*, ed. Jenefer Robinson, 201–12. Ithaca, NY: Cornell University Press, 1997. Originally published in *Metaphor: A Musical Dimension*, ed. Jamie C. Kessler (Paddington, NSW, Australia: Currency Press, 1991), 1–12.
- Guinee, Linda N., and Katharine B. Payne. "Rhyme-Like Repetitions in Songs of Humpback Whales." *Ethology* 79/4 (1988): 295–306.

- Henahan, Donal J. Review of *Echoes of Time and the River (Echoes II)*, by George Crumb, performed by the Chicago Symphony Orchestra. *Musical Quarterly* 54/1 (1968): 83–87.
- . Review of *Eleven Echoes of Autumn, 1965*, by George Crumb, etc., CRI 233 USD, LP. *Musical Quarterly* 55/2 (1969): 280–85.
- Ingold, Tim. “Against Soundscape.” In *Autumn Leaves: Sound and the Environment in Artistic Practice*, ed. Angus Carlyle, 10–13. Paris: Double Entendre; Creative Research into Sound Arts Practice, 2007.
- Krause, Bernie L. “Bioacoustics, Habitat Ambience in Ecological Balance.” *Whole Earth Review* 57 (1987): 14–18.
- Lake, William E. “Form and Temporal Proportions in George Crumb’s *Ancient Voices of Children*.” In *George Crumb and the Alchemy of Sound: Essays on His Music*, ed. Steven Bruns and Ofer Ben-Amots, 83–100. Colorado Springs: Colorado College Music Press, 2005.
- Lorca, Federico García. *Collected Poems: A Bilingual Edition*. 2nd ed. Ed. Christopher Maurer. Trans. Catherine Brown, et al. Poetical Works of Federico García Lorca 2. New York: Farrar, Straus and Giroux, 2002.
- Malouf, David. *An Imaginary Life*. New York: Braziller, 1978.
- Moevs, Robert. Review of *Music for a Summer Evening (Makrokosmos III)* by George Crumb, Nonesuch H 71311, LP. *Musical Quarterly* 62/2 (1976): 293–303.
- Panksepp, Jaak, and Günther Bernatzky. “Emotional Sounds and the Brain: The Neuro-Affective Foundations of Musical Appreciation.” *Behavioural Processes* 60/2 (2002): 133–55.
- Panksepp, Jaak, and Colwyn Trevarthen. “The Neuroscience of Emotion in Music.” In *Communicative Musicality: Exploring the Basis of Human Companionship*, ed. Stephen Malloch and Colwyn Trevarthen, 105–46. Oxford: Oxford University Press, 2009.
- Payne, Katharine, and Roger Payne. “Large Scale Changes over 19 Years in Songs of Humpback Whales in Bermuda.” *Zeitschrift für Tierpsychologie* 68/2 (1985): 89–114.
- Pollack, Gerald S., and Ronald R. Hoy. “Evasive Acoustic Behavior and Its Neurological Basis.” In *Cricket Behavior and Neurobiology*, ed. Franz Huber, Thomas E. Moore, and Werner Loher, 341–50. Ithaca, NY: Cornell University Press, 1989.
- Rothenberg, David. *Thousand Mile Song: Whale Music in a Sea of Sound*. New York: Basic Books, 2008.
- Schafer, R. Murray. *The Tuning of the World*. New York: Alfred A. Knopf, 1977.
- Slabbekoorn, Hans, and Margriet Peet. “Birds Sing at a Higher Pitch in Urban Noise.” *Nature* 424/267 (July 2003): 267.
- Tomlinson, Gary. “Vico’s Songs: Detours at the Origins of (Ethno) Musicology.” *Musical Quarterly* 83/3 (1999): 344–77.
- Von Glahn, Denise. *The Sounds of Place: Music and the American Cultural Landscape*. Boston: Northeastern University Press, 2003.
- . “American Women and the Nature of Identity.” *Journal of the American Musicological Society* 64/2 (2011): 399–403.

- Weber, Theo, and John Thorson. "Phonotactic Behavior of Walking Crickets." In *Cricket Behavior and Neurobiology*, ed. Franz Huber, Thomas E. Moore, and Werner Loher, 316–20. Ithaca, NY: Cornell University Press, 1989.
- Weil, Simone. *Cahiers*. Volume 3. Paris: Plon, 1956.
- Zbikowski, Lawrence M. *Conceptualizing Music: Cognitive Structure, Theory, and Analysis*. AMS Studies in Music. Oxford: Oxford University Press, 2002.