

Alison Maggart

“Listening Through the Light”: Posthuman Feminism in the Poetry Sound Assemblage *Bioluminescent Baby* (2019)

Bioluminescent Baby is one installment of *In the Company of Insects*, a three-part “collection of poetry sound pieces” collaboratively made by poet Fiona Benson, radio producers and sound artists Mair Bosworth and Eliza Lomas, community poetry workshop participants, and adolescents (Arts and Culture Exeter 2020, n. p.).¹ Funded by the University of Exeter’s 2020 Urgency Arts Commissions for projects focused on climate and the environment, *Bioluminescent Baby*’s assemblage of fourteen expert entomologist interviews, poetry, field recordings, sound-scape composition, and Creative Commons music samples explores existential questions of life, transspecies communication, and ecological responsibility. Carrying its listeners across a vast terrain from England to Appalachia to Africa and Polynesia and juxtaposing meditations on insect reproduction and maternal care against observations of CRISPR-fueled gene drive and population collapse,² the work connects “the urgency inherent in an insect’s short lifespan” to “the urgency of the environmental crisis and shrinking biodiversity” (Arts and Culture Exeter 2020, n. p.).

1 In total there are three parts of *In the Company of Insects*: *Bioluminescent Baby*, *Insect Love Songs*, and *Insect Chimeras*. *Insect Love Songs* is a public anthology created by attendees of Benson’s 2019/20 poetry workshops at the Eden Project, Thorverton Arts Exchange, and Malika’s Poetry Kitchen. *Insect Chimeras* includes artwork and poetry by students at Thorverton C of E and Stoke Hill Primary Schools.

2 CRISPR (“clustered regularly interspaced short palindromic repeats”) is a gene-editing technology with applications in biomedicine, agriculture, and animal sciences. One use of CRISPR has been to engineer gene drives, or genetic modifications that are inherited by offspring with a higher probability (in some cases with 100% certainty) than through natural selection. These forced inheritable traits can have beneficial or harmful effects. Because gene drives can both modify, reduce, or eradicate species, many scientists have explored genetically engineered gene drives to regulate insects, like mosquitoes, that transmit disease. For instance, scientists at Johns Hopkins Bloomberg School of Public Health’s Research Institute have modified mosquitos to make them more resistant to malaria, while researchers at the University of California, San Diego have used CRISPR to modify sex genes in mosquitoes, effectively killing female mosquitoes (the carriers of malaria, yellow fever, Zika, and Dengue fever) and sterilizing male mosquitoes. Sterilization methods using synthetic gene drives lead to sudden declines in modified species populations (cf. Johns Hopkins Bloomberg School of Public Health 2018; Scudellari 2019; Wang et al. 2021; Spahich 2022; Naidoo and Oliver 2024).

In grappling with these issues – both intimate and expansive – *Bioluminescent Baby* unfolds a posthuman feminist sensibility that is rooted in specific geographies and unique bodies as well as flows through diffuse and relational networks. Making audible human and more-than-human, visible and invisible, gifts and threats to the environment, *Bioluminescent Baby* aims to “inspire wonder and kinship [. . .] with other inhabitants of this planet” (Benson in Haywood 2020). And, in guiding attention to the resonant spaces *in between* various nodes of connection, it works to “attune” us “differently,” in the words of cultural theorist Astrida Neimanis, “to a world in which we are implicated” so that we might “experiment in modes of worlding *otherwise*” (2017, 64).

The “Firefly Suite” is one of the more pronounced appeals in *Bioluminescent Baby* for such a knotted, multisensory, and relational ethics. “We are all connected,” entomologist Lynn Faust states in her discussion of the *Photinus carolinus*; “and if their little lights go out, we may be next. [. . .] It’s got to ultimately reflect on us.” Yet, by “listening through the light,” she proposes, we might come to see what really matters (Faust in Benson and Bosworth 2021).

The conversation begins with Faust describing the unique flash pattern of the East Tennessee bugs during their mating season – the males’ intermittent synchronized flares. “The scientific term for what you’ll see tomorrow night in the Smokies is ‘discontinuous synchrony’: dark and light, alternating, periods of dark and periods of light,” she explains (Faust in Benson and Bosworth 2021). During the predictable period of darkness – approximately three seconds after the male flashes have ceased – the females rapidly blink their lanterns. It is thus “all about the communication with light,” she summarizes. But “how much emphasis that puts on listening!” Benson rejoins; “that synchrony is not all about making noise; it’s this space of listening” (in Benson and Bosworth 2021). Blurring light and sound, firefly and human, Faust then expands on Benson’s insight while also emphasizing the imperative of embracing difference and singularity in love:

Yes, it’s listening through the light. Yes, it is. You have to have that quiet time. Just like often, if your life is so busy, you feel like you hadn’t had time to think. [. . .] You need that dark time, or that calm time, to answer. And then they can see you among all the flashing lights. If everybody goes dark at once, you can see better that one light. And that’s the light that matters. (in Benson and Bosworth 2021)

In her discussion of the East Tennessee fireflies’ perennial reproductive blink, Faust thus forwards an ecological mode of listening that blurs the boundaries of visibility and aurality. Consonant with recent work in sound studies, which theorizes sound as a “way of knowing” (Feld 2015, 12) or stresses the importance of “tactile, spatial, physical, material, and vibrational sensations” for musical and sonic interpretation (Eidsheim 2015, 8), she suggests that a dynamic, multisensory

“listening through the light,” through the dark *in-between*, can inspire clarity of thought and the flash of new insight. But how exactly does one listen through the light (one of the stranger phenomena of the world)? What does it mean to confound and transgress the senses of sight and hearing? How might such a synesthetic blurring, which points to a vibratory flux that surpasses the human auditory threshold, decenter anthropocentric modes of sensing and interpreting the world’s varied forms of articulation and communication? In short, how might such an approach to listening inform our relations with the world?

To begin to answer these questions, I offer an interpretation of the “Firefly Suite” that considers the Appalachian fireflies in *Bioluminescent Baby* as emblems of “vibrant matter” (cf. Bennett 2010), which encourage a unique, ecological sensibility. Drawing from feminist posthumanism, new materialism, environmental humanities, voice studies, and sound studies, I first outline how a posthuman feminist ethics and ontological orientation are expressed through the figurations of music, motherhood, and *becoming-insect* that connect *Bioluminescent Baby*’s different movements. By adopting scales and perspectives that exceed the human, Benson and her collaborators, I argue, invite their listeners to reconceive their relationship to the environment in a way that appreciates the inextricable entanglement of human corporeality and the more-than-human world. Furthermore, in coaxing listeners to attend to correspondences not just across scientific discourse and poetry, looking and listening, humans and more-than-humans, but also across the temporal, generational divides of mother and child and the spatial divides of place, Benson and her collaborators underscore the need to think cross-modally in our approaches to and solutions for today’s environmental concerns.

Then, attending to the spectra of sonorous materials that make up the suite, I show how Benson’s poetic traversals are reflected in the movement’s formal composition. Dichotomies assumed between scientific and poetic disciplines, didactic and confessional languages, soundscape and recording studio, objective and subjective modes of expression are blurred by the speakers’ distinct intonations and accents; synthesized drones seep into the natural soundscape; and insects dialog alongside Benson and Faust. Ultimately, I argue that in content and form, *Bioluminescent Baby* not only expresses an enchantment with the world’s alluring “shimmer” (cf. Rose 2017, 51), but also recommends an ideal figuration for resonant liminality, the *in-betweenness* of posthuman subjects always in the process of becoming and harmonizing the “multiple and internally differentiated time zones that compose our embedded and embodied selves in advanced capitalism” (Braidotti 2006, 139): the synchronous firefly.

Music, Motherhood, and Becoming-Insect in the *Firefly Suite*

In Benson's poetry, the intimacy and rawness of pregnancy and motherhood and the bonds between female bodies, human and animal, are common themes (cf. Thacker 2016, 175). Meditations on menstruation, childbirth, and other feminine cycles are considered alongside their cultural and historical associations to lunar, tidal, and other natural phases. Through the "deeply personal," Benson thus draws "connections to other bodies across space and time" (Thacker 2016, 75).

In her debut collection *Bright Travellers* (2014), for instance, "Sheep" links Benson's miscarriage to the bloody birth of a lamb; "Milk Fever" describes the involuntary leakiness of women's bodies and the fluid connections between mother, child, and ocean; and in "Breastfeeding" Benson's breastmilk locates her within a lineage of past and future women: "A long line of women | sitting and kneeling, | out of their skins | with love and exhaustion" (Benson 2014, 56). This image of infinite regression, woman after woman, connected by the milky "passage from body of water to body of water (always as body of water)," gestures not only to the female labor that powers human life, but also "provides a vector," according to Neimanis, for "mapping" human and non-human social and ecological "responsibilities" (2017, 17). Because water flows from single human body through ocean and atmospheric currents, gathering on its journey different threats and gifts to be deposited in specific locations and absorbed by specific bodies, it reveals the intimate connections between humans, non-human organic lifeforms, and inorganic entities (cf. Neimanis 2017, 40).

In *Bioluminescent Baby*, Benson chooses more alien kin – insects – that inspire both fascination and "revulsion," love (born of her mother's interest in zoology) and concern (originating in her father's bee allergy; cf. Klein 2023). In specific, the collection focuses on insect sexuality and maternal care in the face of violence and loss. Each of its fourteen movements is dedicated to an insect's erotic song: the trilling and rubbed harps of British and Polynesian field crickets, the caring cockroach's purrs, the ecstatic chirps of cicadas. All caring mothers, the female Mozambican mosquito sips human blood "to ripen her eggs," the rice-sized Blue Ghost firefly cradles her hatch from the aggression of a feather, the cockroach nurses her live-born brood with secretions "like milk" from anus and armpit, and Benson (and other hopeful human mothers) erect barriers between hostile environments and their skin to safeguard their ova.

The symbiotic and hostile meetings of humans and insects across the world, Benson makes clear, are not just matters of nature; they are conducted along lines of technology, class, and politics. Reflecting on the inextricable conjunction

of maternal care and harm in mosquito-human relations, “Mozambican Mosquito” turns toward water, blood, and the politics of location:

In the malaria ward the beds are pushed so close
 The sleepers share the same bad dream: a female mosquito
 Filling her soft bulb, dipping her beak for a drop of blood
 To ripen her eggs; how her abdomen’s rosé flush
 Deepens to ruby as she siphons out water as waste.
 [. . .]
 And in London a woman splices a mosquito egg to corrupt the gene
 That defines male sex; there will be infertile males
 And in eight generations (a matter of days?) the brood
 Will collapse.
 (Benson and Bosworth 2020)

Later in the poem, Benson, likening her body to a “crystal glass, full to the brim,” resembles the female mosquito as much as the mosquito, who uses “two serrated needles | to cut through your tissues,” operates like the London scientist. Yet, as much as Benson connects humans to mosquitoes – both threatening to the other for the sake of their offspring – she also insists upon differences not just between human and insect, but also between Mozambican and English mothers. The mosquitoes discriminate – “some of us smell sweeter” – while the humans’ electric rackets “zap fruit flies, crane flies, moths, beetles on the wing.” And while across the world, though predominantly in Africa, a child dies of malaria every two minutes, on her “privileged Northern isle [. . .] [her] babies will be inoculated against most ills” (Benson and Bosworth 2020). Thus, rather than forward attachment as the basis of a relational ethics or as the primary means by which human-animal kinship should unfold, Benson recognizes the value of *detachment* and distance in human and more-than-human encounters. She also acknowledges intraspecies inequities. Although relations may be contingent, they are not necessarily reciprocal. As posthuman feminist Rosi Braidotti would say, “We-are-in-*this-together-but-we-are-not-one-and-the-same*” (2018b, 20).

These themes tap into larger feminist and posthuman flows pertaining to new and complex forms of subjectivity that frequently adopt transgressive, grotesque creatures – cyborgs, trans-genetic mice, regenerative, cloned, and metamorphizing animals – as models for critiquing the ideological binaries and naturalized hierarchical structures established under western liberal humanism. This is in part because such hybrids, and insects in particular, meet women always on the “side of ‘Otherness’” (Braidotti 2006, 130). “Tiny miniatures,” insects “exercise the same immense sense of estrangement as dinosaurs, dragons or other gigantic monsters” (Braidotti 2002, 149). They are not only compelling figurations for

thinking against established epistemological frameworks, but also for affirming difference within a monistic frame (cf. Gruen 1993).

Dismantling notions of bodily autonomy and ontological fixity through parasitism, swarming behavior, and metamorphosis, insects are a locus of both intrigue and disgust. The potential for harm in insect-human encounters has made bugs fruitful figurations for revealing the “undervalued importance of distance and detachment in more-than-human ethics;” and their multitudinousness has encouraged a thinking *otherwise* “with the many” (Giraud 2018, 119). Insects illustrate how dynamic affective forces in the world “emanate from a spatio-temporal configuration rather than from any particular element within it” (Bennett 2010, 35). Perhaps most importantly, however, insects underscore a fluid ontology of becoming through metamorphosis: “[Insect life] dwells between different states of in-between-ness, arousing the same spasmodic reactions in humans as the monstrous, the sacred, the alien;” they are thus “hybrid *par excellence*” (Braidotti 2002, 149), full of “non-binary and non-heteronormative behavior” (Benson in Klein 2023). For Benson, it is this aspect of insect life that is most bewitching: “there’s something so mystical about the transformations they undergo. [. . .] They’re beyond anything we can invent” (in Klein 2023). And it is this propensity that ties them to maternal care.

Motherhood, maternity, and a host of associated substances – breast milk, amniotic fluid, the placenta – are also figurations that evidence the material body as a site of ontological becoming (cf. Neimanis 2017; Braidotti 2018a; Van der Waal 2018). Not only do they gesture toward grander transcorporeal spatial and temporal extensions – generation following generation – but they also construct an ethics based on relationality and care. For instance, gestational fecundity – “the giving over of one’s own materiality for this proliferation of further life, different to one’s own” (Neimanis 2017, 92) – points toward virtuality because it reveals the body as site of multiplicity and connection as well as stresses the *yet to come*. Similarly, because the pregnant posthuman experiences “intuitively and intimately the shifting borders of otherness within themselves” (Braidotti 2018a, 170–171), they also recognize their own “being with the always not-yet of the world” (Van der Waal 2018, 269). The liberal autonomous subject is thus decentered not only because the pregnant posthuman experiences their body as simultaneously self and other, but also (and more importantly) because the pregnant posthuman, in materializing the *potential* of the *yet to come*, recognizes the extension of their embodiment into the future and past (cf. Braidotti 2018b, 30). Because the placenta is the organ that allows for the material flow between different entities within a body, it is, for Braidotti, “the perfect figuration for thinking both unity and diversity, specificity and difference within a monistic frame” (2018a, 316). Encouraging an understanding of subjectivity as a relational process that is mate-

rial, embodied, and shaped by human and non-human encounters, these maternal figurations further compel an expansive reconsideration of broader societal and political interactions (cf. Braidotti 2018a, 316). Grounded in a shared *in-between-ness*, then, insects and maternity contest liberal conceptions of individual autonomy and fixedness, and instead forward an ontology of interconnection and dynamic unfolding.

In the “Firefly Suite,” the synesthetic convergence of “listening through the light” also signals an epistemological shift away from dialectical opposition toward relational monism. All three poems in the suite explore liminal spaces and times between light and dark, interiority and exteriority, human and beetle co-existence at scales that exceed the human. While a mythological dragon, small as a rice grain, sets the scale in the central poem, the cosmos is the measure in two bookending poems. And, just as Faust look-listens to the beetles’ pulses across the Appalachian sound milieu, we, too, are encouraged to listen through *Bioluminescent Baby*’s structural rhythms, beyond the self.

The Audio Pamphlet

In the Company of Insects – an “audio pamphlet,” published online to “restore [poetry] to its oral roots” – exemplifies Benson’s frequent emphasis on poetry’s musicality: poetry is “music on a word level,” she says, composed of “word sounds” (in Haywood 2020). In *Bioluminescent Baby* she establishes loose associations within and across the poems through the sonorous elements of poetry, through poetic alliteration, assonance, rhythm, and meter; she also revels in the unique sounds of unfamiliar words (what entomo-artist Barrett Klein describes as the “etymology of entomology,” such as “instar” and “crypsis”; 2023). Uniquely, in the “Firefly Suite,” possibly to balance the beetles’ *un*noisy communication, Benson explores music–poetry resonances by alluding to the musical form of the instrumental suite, a cross-cultural genre that evolved from stylized sets of loosely connected dances on light themes, not uncommonly with titles descriptive of nature, and paired by alternating affects or tempi.³ In counterpoint to the beetles’ flickering,

3 Late seventeenth-century and early eighteenth-century instrumental suites, for example J.C.F. Fischer’s *Le journal de printemps* (1695) and *Musicalisches Blum-Büschlein* (1696), G.F. Handel’s *Water Music* (1717), and François Couperin’s *Le Rossignol en amour* (1722), might have descriptive titles or include figurations and ornaments that imitate nature (such as birdsong). Twentieth-century characteristic suites, like Debussy’s *Suite bergamasque* (1905), might also include movements with titles evocative of nature, such as “Clair de lune.”

the structure of the “Firefly Suite” is built on an alternation between conversational interviews with Faust and formal readings of Benson’s reflective poetry on three firefly species found in East Tennessee: Big Dipper Fireflies, Blue Ghost Fireflies, and Synchronous Fireflies (Tab. 1). In this manner, the three distinct beetle species’ courting dances, performed in flight and flash and elaborated through different textures of the voice, adhere to the structure of an instrumental suite.

Tab. 1: Formal Structure of the “Firefly Suite”.

Time	Topic	Speaker	Soundscape
00:15–00:55	Intro: Big Dipper Fireflies Discussion	Faust	Guitar to Environmental Soundscape
00:56–05:19	Big Dipper Fireflies Discussion	Faust	Natural Soundscape
05:20–07:24	“Big Dipper Fireflies” Poem	Benson	Guitar with Wildlife Intrusions and Footsteps leading into . . .
07:25–11:10	Blue Ghost Fireflies Discussion	Faust	Environmental Soundscape
11:11–12:05	“Blue Ghost Fireflies” Poem	Benson	Drone and Footsteps leading into . . .
12:06–15:00	Synchronous Fireflies Discussion	Faust	Environmental Soundscape to Drones
15:01–16:22	“Synchronous Fireflies” Poem	Benson	Pulsing Drone and Footsteps leading into . . .
16:23–19:35	Coda: Fireflies in Knoxville, TN	Faust	Environmental Soundscape, Ending with Drone

At first, the alternation between Faust and Benson seems to establish dichotomies between scientific and poetic discourse, informal and formal expression, expansive soundscape and intimate immediacy. Faust’s informal, scientific and autoethnographic commentaries are generally placed in natural (albeit amplified) sonic environments that include crickets’ trills and chirps, grasshoppers’ buzzy clicks, and owls’ hoots alongside the sounds of car door alarms, tires on gravel and rolling through a creek, and human footsteps. In contrast, Benson’s recitations are closely miked and preceded by a transition from soundscape recording to music (a gentle guitar accompaniment), synthesized drones, or rhythmic pulses. This clear sonic shift frames Benson’s poetic readings outside the landscapes she details, thus divorcing these sections from spatio-temporal specificity. Chronicling the passages from one mode of inquiry to another, Bosworth filters in footsteps

that bring listeners from Benson's readings back into Faust's environment; just as in early radio drama, they play an important role in (re)constructing the work's localized context: they provide a sense of three-dimensional space, ground the narrative in a virtual body, and bid listeners to follow.

Faust and Benson also have distinct accents, prosodies, and expressive registers that divulge their paralinguistic contexts. When Faust educates or describes the scientific field's current understanding of firefly behavior, she speaks authoritatively; and when she reflects upon her experiences with fireflies, she conveys personal sentiments of nostalgia, amazement, and concern for the creatures. In contrast, Benson recites composed poetry in a neutral and reserved style of elocution that conforms to what voice studies scholar Marit MacArthur describes as "poet voice" (2016, 44). Characterized by "(1) the repetition of a falling cadence within a narrow range of pitch; (2) a flattened affect that suppresses idiosyncratic expression of subject matter in favor of a restrained, earnest tone; and (3) the subordination of conventional intonation patterns dictated by syntax, and of the poetic effects of line length and line breaks, to the prevailing cadence and a slow, steady pace," poet voice is a kind of "monotonous incantation" that, by limiting theatricality, is intended to signal sincerity or intellectual detachment (MacArthur 2016, 44). As a mode of performance that regularly patterns intonation and cadence, monotonous incantation can also create a hypnotic effect, not unlike that of ritualistic chant, imbuing the poetry with a sense of formality even if the poem is free verse (cf. MacArthur 2016, 39–58).

As indicated by calculations performed by Voxit (Tab. 2), an open-source program for the analysis of prosodic measures developed by neurobiologist Lee Miller, programmer Robert Ochshorn, and MacArthur at the University of California, Davis, Faust speaks more quickly than Benson and with a patterning of pauses (or "rhythmic complexity") that is also more predictable and regular. What differentiates the two speakers the most, however, are the aspects of their prosody tied to pitch. Faust's pitch speed ("velocity"), lilt ("acceleration"), and the predictability of her pitch patterning ("entropy") are greater than Benson's, capturing Faust's East Tennessee accent and conveying a heightened expressivity.⁴

4 For a detailed discussion of the twelve prosodic measures that MacArthur and her collaborators examine to distinguish Formal and Conversational intonation patterns, Expressive and Dramatic styles, as well as their combinations (Formal-Expressive, Conversational-Expressive, Formal-Expressive-Dramatic, Conversational-Expressive-Dramatic, Formal-Inexpressive, and Conversational-Inexpressive) see MacArthur et. al (2018, 29–33). Benson's slow rate of speaking as well as her narrow pitch range are congruent with what MacArthur describes as a Formal-Inexpressive style.

Tab. 2: Prosodic Measures Calculated by Voxit.

Time	Topic	Speaker	WPM	Rhythmic Complexity	F0 mean velocity (8ves/s)	F0 mean accel. (8ves/s2)	F0 entropy
00:15–00:55	Introduction	Faust	119	7.7	1.1	0.6	3.0
00:56–05:19	Big Dipper	Faust	110	7.8	1.4	0.7	3.1
05:20–07:24	Fireflies	Benson	94	8.5	0.8	0.5	3.0
07:25–11:10	Blue Ghost	Faust	175	5.3	1.8	0.8	3.7
11:11–12:05	Fireflies	Benson	93	6.8	0.7	0.4	2.8
12:06–15:00	Synchronous	Faust	153	5.6	1.8	0.8	3.7
15:01–16:22	Fireflies	Benson	115	6.7	0.5	0.3	2.4
16:23–19:35	Coda	Faust	173	5.1	2.0	0.9	3.7
AVERAGE		Faust	146	6.3	1.6	0.8	3.4
AVERAGE		Benson	100	7.3	0.7	0.4	2.7

Despite these seeming oppositions, however, listening closely to the “Firefly Suite” reveals a more porous relationship between scientific and poetic modes of speech and understanding. Indeed, by fusing scientific and affective modes of inquiry in their assemblage, Benson and Bosworth affirm the complex ways in which knowledge is made by natural and cultural, material and discursive forces. The different prosodies undermine common perceptions that scientific language is more cold, inexpressive, and objective than poetry, or that poetic language is more effusive and unrestrained than scientific language. Words and images introduced in the scientific discourse are echoed in Benson’s poetry; and sentiments in Benson’s poems are elaborated in Faust’s musings. Faust, for instance, introduces the Blue Ghosts as small as “a grain of rice, no wings,” which Benson restates in her poem. And while it is the wingless Blue Ghosts whom Faust describes as “little prisoners,” in Benson’s “Big Dipper Fireflies,” it is the humans who are “strangers to ourselves | in multiple prisons” (Benson and Bosworth 2021). Synthesizers intrude into Faust’s discussions, and cricket trills sometimes bleed from Faust’s background into Benson’s readings. These sonic traversals, which also include mimetic vocal gestures and word painting of the soundscape, importantly, do not simply glue dance to dance, but instigate dialogs and metamorphoses; they also aestheticize *becoming-insect* and portend the possibility of interspecies communication and improvisation.

Through the Lights of the *Firefly Suite*

In *Bioluminescent Baby*'s "Firefly Suite," Benson and Bosworth poeticize childhood wonder, motherly devotion, and lovers' quiet knowing. The opening section of "Big Dipper Fireflies" sets the Appalachian scene with a relaxed flatpicking guitar, car noise, and Faust's description of a river and deer. Later, a gentle, arpeggiated guitar loop underscores Benson's recitation, during which she recalls memories of catching the beetles: "cupping them up, | holding them close." Her imagery sets up a contrast between the fireflies, "rising up from the grass – | green and upward cinders, | gentle wandering stars –" and the humans, who "on our knees" have become "strangers to ourselves," "unskyed," and "ready to lie down." In this state of opposition, both are prisoners: the beetles are imprisoned by human hands, and the humans are imprisoned by their own disenchantment (Benson and Bosworth 2021).

In Benson's monotonous incantation subjective expression is minimized, seemingly capturing the initial disaffection of the humans in the poem. Her voice is almost exclusively limited to the range of a minor third (E3–G3), and each line is patterned by either pitch repetition or a falling cadence of a major or minor second. Yet, these restrictions, by sacrificing theatrical elocution, accentuate the subtle sonic and musical features of the poetry: the local alliterations, assonances, internal rhymes, and other phonological and syntactical parallelisms; they also draw attention to miniscule aberrations from the overriding pattern. In such formal readings of poetry, literary scholar Charles Bernstein describes, "the project [. . .] is to find the sound in the words," without relying on theatricality and without "eclips[ing] the ragged music the poem" with excessive "eloquence" (1998, 11). Moreover, "this monovalent, minimally inflected, and in any case unaugmented, mode," he continues, "[touches] on the essence of the medium" (Bernstein 1998, 11). This is because in focusing attention on the *sound* of words, such audiotexts "[re]materialize] language" and thus synthesize speech modes of perception (which involve cognitive interpretation) and nonspeech modes of perception (which do not attend to meaning but which can be a source of pleasure; cf. Bernstein 1998, 18). There is an animality to this transformation and to the pleasure we might take in tuning in to language as material sound. Hence, Bernstein concludes not only that such poetry readings are "a performance of the carnality of language – its material, sensuous embodiment," but also and moreover that "the most resonant possibilities for poetry [. . .] can be realized only when the performance of language moves from human speech to animate, but transhuman, sound: that is, when we stop listening and begin to hear; which is to say, stop decoding and begin to get a nose for the sheer noise of language" (1998, 22).

Despite the human-insect polarity that Benson establishes in the poem's imagery, a sonic affiliation is suggested in the poetry. With no apparent rhyme or metrical scheme, the poem is sonically held together by numerous sibilations. Originating from the opening "Silently" and often elongated at line ends, these noisy sounds link Benson's voice to the buzzing and trills of nature:

Silently at dusk
the big dippers
rising from the grass –

green and upwards cinders,
gentle, wandering stars –
and we two on our knees

cupping them up,
holding them close,
like something we lost.
(Benson and Bosworth 2021)

In fact, throughout "Big Dipper Fireflies," when Benson intimates a connection between humans and insects, the bugs seem to light up in joyous response. For instance, the tree crickets first trill when Benson likens their "emerald electric pulse" to tree sap (Fig. 1). And, in the last tercet of the Big Dipper section, the buzz of a grasshopper sets the "tremble" of Benson's inner child (Fig. 2).

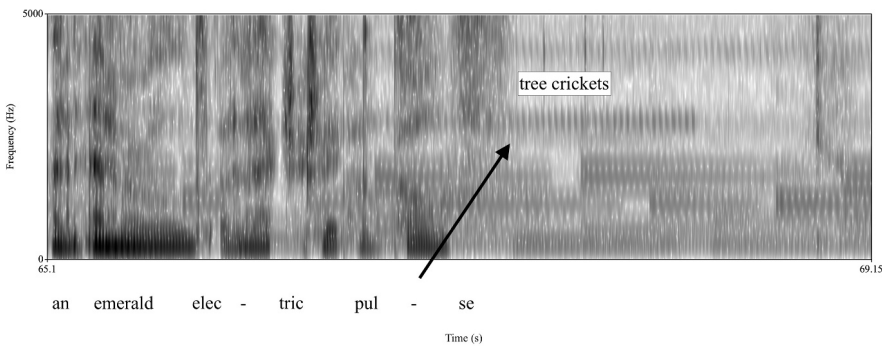


Fig. 1: Cricket "Pulse" in Response to Benson's Poetry. Spectrogram created in Praat.

As Lomas explains, the sound design throughout *Bioluminescent Baby* was dedicated to such attention to detail: "I'm really, really deep in the poem and thinking about every specific line and word and how to best represent it in sound" (in Haywood 2020). *Bioluminescent Baby* is therefore not a traditional soundscape compo-

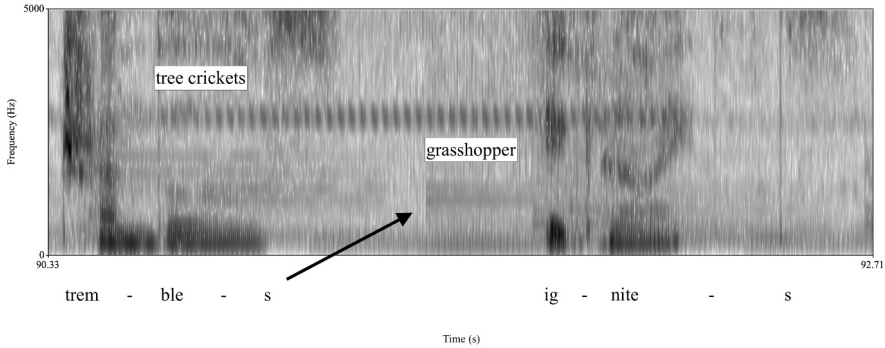


Fig. 2: Grasshopper “Tremble” in Response to Benson’s Poetry. Spectrogram created in Praat.

sition, because it does not present (or purport to present) an objective or documentarian sonic environment. Rather, the insects’ songs play an important part commenting on and painting the poetry.

Line 7 – “cupping them up” – is the first instance that does not end with a sibilant speech sound. It is also the first (and only) line that Benson speaks with a rising tone (F#-G). This inflection mirrors the gesture of cupping described in the poem, of course. But perhaps less obviously, it also accentuates parallelisms between lines 7 and 8 (“holding them close”), both of which are composed of four syllables and strong assonances. Furthermore, this subtle sonic and structural repetition echoes line 2, which introduces the colloquial name of the species at the center of the poem (“the big dippers”); it finally also foreshadows the repetition of “cupped” and “held” in the third poem of the suite, “Synchronous Fireflies” (as I discuss in more detail below).

In “Blue Ghost Firefly,” Benson ruminates on the species’ capacity for maternal care. Despite their appearing less developed than other fireflies, Faust describes how the wingless Blue Ghost females protect their eggs, even in the face of danger. Unlike Big Dipper females, which have evolved to have wings and are thus capable of flight, the Blue Ghost females expend their energy solely on safeguarding their clutches. When threatened with a feather or paintbrush, for instance, Blue Ghost fireflies shield their eggs by curling their bodies around them. For Faust, this behavior – unusual among insects⁵ – reveals a highly evolved behavior from which humans can learn:

⁵ Another exception would be the female glow-worms of the species *Lamprigera* found in Thailand.

I had always thought, oh, well, they're the primitive ones [. . .] because they don't have wings, and they don't look like the males, and they can't really move very well. But in the end, they might be the most highly developed, because they're showing maternal care. They [the Blue Ghost and Big Dipper female fireflies] have gone two completely different directions [. . .] on how to best get the next generation on the ground. But it's just different strategies. And again, that reminds me of humans. You know, we do the same thing. Some stay home with the babies. Some work, some try to do everything, and it's different, and it works different ways for different people. (Faust in Benson and Bosworth 2021)

In this passage Faust implies not only that biological and social factors are inextricable from one another, but also that they equally advance evolutionary development. The species' divergent evolutions do not indicate a linear or progressive improvement, she emphasizes, but rather share a goal of lively proliferation. Like new materialist philosopher Elizabeth Grosz's re-assessment of Darwin, Faust's conception of evolution also prizes and naturalizes difference, excess, and open process; she recognizes that life is "a kind of opening up of matter to indeterminacy, a qualitative transformation of matter into the unexpected. [. . .] It adds to the contained and structured material universe the openness of the virtual, the potential to be otherwise" (Grosz 2005, 41). Crucially, such an understanding of the world is also political, Grosz argues, because it shows not only how unfixed and unstable the world is, but also how consequential circumstance and contingency are in *becoming-other*.

In complement to Benson's sections, in which the insects paint the poetry, in Faust's sections, vocal gesture often mimics the insects. When she describes the Blue Ghosts' waist-high flight, for instance, she elongates and pitches the diphthong /ou/ in "they float" higher than the surrounding phonemes, creating a gently suspended arc in her voice. Similarly, she pitches "wings" higher than all other words in its locale. And when she describes the Ghosts' maternal care – how they will "curl their little body around [their clutch of eggs]" – her inflection pitches "body" higher and "around" lower than "curl," creating a sonic gesture of embrace (Faust in Benson and Bosworth 2021). These acoustic analogies, likely performed unintentionally, express and elicit a subtle kind of physical empathy that sensitizes and extends human experience into unfamiliar territory. Such embodied attunement, Neimanis argues, allows humans to imagine and make sense of that which otherwise is beyond our grasp (cf. 2017, 53–59). It is the first step in developing a posthuman phenomenology.

In her poem "Blue Ghost Firefly," Benson further muddies the line not only between beetle and human, but also virtues, mythological beings, and inanimate objects. Just as the beetle metamorphizes through simile and metaphor into a dragon and a roof, Benson too undergoes a *becoming-other*, *becoming-dragon*, *be-*

coming-insect, recognizing not only the maternal care that she and the Blue Ghost share, but also the incalculable value of their cache, the embryonic *not-yet*:

The female is small
and larviform,
like a grimy rice grain.

Up close you see
her reticulated,
transparent back,

its epaulets of light.
Sweet love
coiled round your eggs,

like a diminutive dragon
guarding your hoard,
its wet, nested glow.

It's the rest
of your life's work
to make yourself a lid,

a shield, a reinforced roof.
I too keep guard –
my daughters

the softest part of me –
and will die
at my post.

(Benson and Bosworth 2021)

Musically, Bosworth abandons the guitar accompaniment of the “Big Dipper Fireflies,” and instead introduces a more alien, sustained drone. Approximating Faust’s vocal frequency when she describes how “it works different ways for different people” (the last phrase Faust speaks, leading into the poem), the drone’s fundamental drifts around C4. Periodically intensifying so that overtones on D#5 and F#5 gleam through the insects’ susurrations and murmurs, it evokes the ethereal timbre of a crystal singing bowl. The drone cushions Benson’s poetry and sonically displaces her commentary from the Appalachian soundscape and the critical reflections of the scientist; yet at the same time, as audible substitute for the Blue Ghosts’ uniquely continuously glow, it performs and foreshadows the sensory conversion that underpins the final poem.

In “Synchronous Fireflies” Benson contemplates what might become. Like in “Blue Ghost Firefly,” drones – six G-major triads followed by six F#-major triads – now pulsing, articulate the flash train of six lights emitted by the *Photinus caroli-*

nus and establish the lulling rhythm – the “soft pace” and “quiet spell” – of the darkness that envelops the Appalachian valley at dusk when the fireflies emerge. The gentle minor descent of the drones also captures Benson’s falling cadence in the poem’s introduction – when she announces, “Synchronous fireflies | *Photinus carolinus* | For James,” she pronounces “Synchronous” at approximately 196.29 Hz (G3 – 2.58 cents) and “James” at 184.49 Hz (F#3 + 4.75 cents). Throughout the poem, her incantation continues to hover around G3 and F#3. In its hypnotic rhythms, constructed by the drones and Benson’s recitation style, in its echoes of previous poems in the suite, and in the synthesized drones’ sonic materialization of the fundamental frequencies of Benson’s speaking voice, “Synchronous Fireflies” most closely realizes the ritualistic tenor of MacArthur’s “formal-inexpressive” style and Bernstein’s transhuman carnality.

Like in “Big Dipper Fireflies,” the crickets are vocal respondents. At Benson’s mention of “speaking,” a lower-frequency chirp is initiated, only to suddenly drop out on the word “darkness” (Fig. 3).

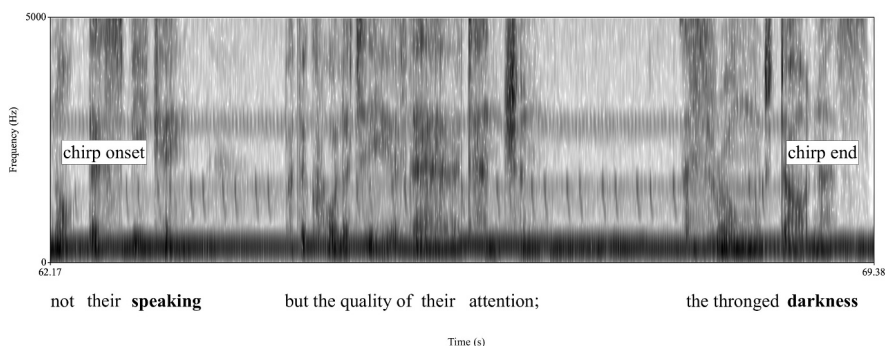


Fig. 3: Cricket “Speaking” and “Attention” to the “Darkness” in Response to Benson’s Poetry. Spectrogram created in Praat.

Unlike in “Big Dipper Fireflies,” however, rather than imprison, the dark night embraces; it provides the curtain for the “two lovers in a drawn bedroom” and buoys their quiet “attention;” it is “a thronged darkness into which you might send | any thought, and find it cupped and held.” In this inverted echo of “Big Dipper Fireflies,” wherein Benson and Bosworth cup the fireflies close, Benson suggests that humanity and nature are mutually encompassing, both capable of holding the other. Human and beetle acknowledge difference – “there was more of a distance, a fourth wall, | as the fireflies displayed at the far side of the world in a complicated language I couldn’t understand | and wasn’t meant for me, and I felt selfish and estranged” – and the necessity of balance and reciprocity – “though

I came for the light, it was the dark that kept me safe” (Benson and Bosworth 2021). Indeed, in the end it was the dark’s quiet listening to the *in-between* that captured Benson’s attention: “It was the dark that was synchronous,” she states in her interview with Klein, “and it was this lovely thing that the dark is listening [. . .] and there was that kind of unexpected beauty of the dark being a kind of listening” (Benson in Klein 2023).

Shimmering in Southern Appalachia

What the dark listens to and participates in is what anthropologist Deborah Bird Rose describes as the land’s “shimmering.” Drawing from the Australian Aboriginal concept of *bir̪yun*, the “shimmer of the biosphere” is a “temporal pattern,” an “iridescence,” or ecological “pulse” from “dull to brilliant, and then back to dull, and then back to brilliant.” The dark is thus of crucial import – “for shimmer to capture the eye, there must be absence of shimmer” – and should therefore be “understood not as lack but as potential,” ushering forth excess, pleasure, and beauty (Rose 2017, 54–55). Often playing out in sexual display – the blooms, light shows, and plumage that plants, animals, and inorganic matter deploy to “lure others” to themselves – shimmering “assumes shared desires not only to coexist with other species within a territory, but also to take care of them and draw pleasure and joy from such love” (Braidotti 2022, 181). In Southern Appalachia, the Big Dippers’ swoops, Blue Ghosts’ hued glow, and Synchronous Fireflies’ blinks – species-specific flash patterns – are coded courtship dances that compose a small part of the place’s unique kinetic polyrhythm. Attracting insect mates and human spectators, the beetles’ pulsing, procreative, perennial shimmer portends the “possibility of becoming,” the perpetual change, transformation, and metamorphosis that connects us to “ancestral and future generations” (Malone et al. 2020, 132). Yet, at the same time that it sparks new life, its dimming also reflects past droughts, housing developments, demolitions, and light pollution. Just as “shimmering comes into play as the light of life,” it is also extinguished by extinction (Malone et al. 2020, 132). Perhaps for this reason, the beetles’ bioluminescence has long inspired meditations on life’s ephemerality; in folklore around the world, they often symbolize “a new beginning, the souls of the dead, passionate love, and the beauty of the skies” (Faust 2017, 13). In material and discursive ways, then, they make up, or partake in the worlding of, the place.

In all these ways, the “Firefly Suite” expresses the shimmering vitality and heritage of Southern Appalachia. But how can such enchantment not only inspire an ethical orientation toward our more-than-human kin but also advance our

worlding otherwise? Reading *Bioluminescent Baby* from a posthuman perspective, I argue, suggests a new figuration for such issues. The *Photinus carolinus*' synchronicity – sonified by the pulsing rhythms of the final poem – points to the synchronization of multiple extensions of the posthuman subject through time and space that Braidotti, drawing on Deleuze, argues is key to a posthuman affirmative ethics. Because the posthuman subject is always actualizing the virtual, they are acutely attuned to the liminality and processual nature of the present. “Approaching the present,” she writes, “produces a multi-faceted effect: on the one hand the sharp awareness of *what we are ceasing to be* (the end of the actual) and on the other the perception – in different degrees of clarity – of *what we are in the process of becoming* (the actualization of the virtual)” (Braidotti 2019, 36–37). While the actual is limited by the restrictions that political and societal institutions impose on an entity [*potestas*], the virtual is dynamic, fluid, and expansive [*potentia*]. Both *potestas* and *potentia* structure consciousness insofar as the “interplay between the present as actual and the present as virtual spells the rhythms of subject formation” (Braidotti 2019, 37). Synchronizing the actual and virtual is thus necessary for thinking new possibilities. And, although synchronicity can only ever be fleeting, it is nevertheless the very “task of philosophy” to “track the different modes of synchronization and bring them into adequate conceptual representation. [. . .] [This is] about the creation of alternative thinkable and shareable subject positions” (Braidotti 2006, 94–95).

Listening through the light and other natural articulations is therefore an invitation to think ecologically and relationally, to resist eye/ear, object/subject, and other dichotomies, to be affected by the world's shimmer, to recognize how we affect it, and to imagine new ways of interaction. Behaving as wave and particle, light, the paradigm of Karen Barad's onto-epistemology, illuminates the entanglement of meaning and matter (cf. 2007). By transposing sonic vibration onto a visual scale that exceeds human auditory perception, listening through the fireflies' light decenters the human. Yet, at the same time it does not seek to erase the differences between human and nature in some transcendent fashion; nor does it remove human accountability. The lights are not *for* us, but nevertheless “reflect on us.” Rather, as a form of vibrant enchantment, listening through the light compels an investment in and ethical comportment toward a particular place. In Southern Appalachia, Faust reminds, the fireflies are not just fireflies; they “represent a canary in the coal mine, they're an indicator species of the health of that particular place” (in Benson and Bosworth 2021). Listening *through* moreover suggests a listening practice that is all-enveloping and interactive; when listening *through* we listen not simply to the source, but *through* a host of objects and mediums that influence sound as it travels through space and time, through the echoing Smoky Mountains, through the buzzing fluctuations of air. By focusing

attention on this *in-between*, toward the “thronged darkness into which you might send | any thought, and find it cupped and held” (Benson and Bosworth 2021), listening through also highlights virtuality, becoming, and the process of synchronization. Attuning to the shimmer, voice, and memories of place – lightening bugs and Southern drawls – thus helps to illuminate new forms of alignment between past and present, humans and more-than-humans, living and non-living entities, politics and ethical care.

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