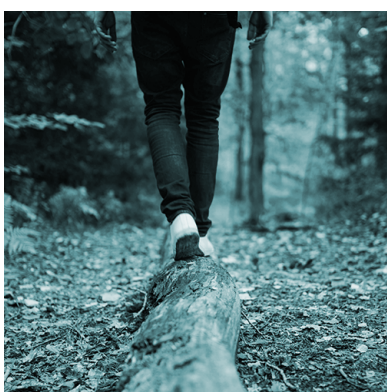


IMPACT

THE JOURNAL OF THE CENTER FOR INTERDISCIPLINARY TEACHING & LEARNING



VOLUME 13, NUMBER 1, WINTER 2024

TABLE OF CONTENTS

About Us	3
Editorial Statement	4
About This Issue's Authors and Editors.....	5
Announcements	7
Essays:	
Waking Up to No Sound: Music Psychology and Climate Action By Lindsay Fleming and Daniel Levitin, McGill University	8
Re-Educating and Rewilding: Learning to Listen Honestly as a Music Composer/Educator By Nicholas P. Quigley, R.L.M. Resiliency Preparatory Academy and B.M.C. Durfee High School, Fall River, Massachusetts, and Tawnya D. Smith, Boston University	17
Musical Autopoiesis and Its Relationship to Nature, Environment, and Environmental Issues By Christian Morgner, University of Sheffield	26
On Teaching About Music and the Environment By Hao Huang, Composer and Pianist, Scripps College.....	32
Initiation, Immersion, and Invitation: Three Environmental Compositions for Opera By Megan Grumbling, Poet and Librettist, University of New England	39
Book Reviews:	
Walters, Lisa, and Brandie R. Siegfried, eds. <i>Margaret Cavendish: An Interdisciplinary Perspective</i> . Cambridge: Cambridge University Press, 2022. xvii + 307 pp. ISBN (hardback): 978-1-108-49036-8. By Marcus P. Adams, State University of New York at Albany	48
Fischer, Mia. <i>Terrorizing Gender: Transgender Visibility and the Surveillance Practices of the U.S.</i> <i>Security State</i> . Lincoln: University of Nebraska Press, 2019. 282 pp. ISBN (hardback): 978-1-4962-0674-9, ISBN (paperback): 978-1-4962-3053-9. By C.L. Quinan, University of Melbourne	50
Luckett Jr., Robert E., ed. <i>Redefining Liberal Arts Education in the Twenty-First Century</i> . Jackson: University Press of Mississippi, 2021. xvii + 286 pp. ISBN (paperback): 978-1-4968-3317-4. By Colin A. Anderson, Hiram College	52
Bruce, Emily C. <i>Revolutions at Home: The Origin of Modern Childhood and the German Middle Class</i> . Amherst: University of Massachusetts Press, 2021. 247 pp. ISBN (paperback): 978-1-62534-562-2. By Amanda M. Brian, Coastal Carolina University	55
Previous Issues	57

ABOUT US

Impact: The Journal of the Center for Interdisciplinary Teaching & Learning is a peer-reviewed, biannual online journal that publishes scholarly and creative non-fiction essays about the theory, practice, and assessment of interdisciplinary education. *Impact* is produced by the Center for Interdisciplinary Teaching & Learning at Boston University College of General Studies. *Impact* accepts submissions throughout the year and publishes issues in February and July. Please submit your essays for consideration at citl@bu.edu.

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EDITORIAL STATEMENT

Dear Readers,

Welcome to the Winter 2024 issue of *Impact: The Journal of the Center of Interdisciplinary Teaching & Learning*. The following essays explore interdisciplinary connections that link musical ideas and experiences to the environments that humans and non-human species inhabit. Readers will quickly note the range of approaches adopted in these essays, including insights from teacher training programs, psychology, critical theory, and the performing arts. Despite the differences, each essay is informed by an underlying assumption that musical engagement can help us make better sense of our current moment of ecological crisis.

In our first contribution, Lindsay Fleming and Daniel Levitin of McGill University argue that environmental, behavioral, and music psychologists can draw upon research into how music influences our emotions, moods, and connections with others to help create workable and evidence-based climate action programs. Music, they argue, can be an important contributor to “successfully engaging the public in climate action,” a goal they hope will be furthered by deeper research into music psychology.

In the second contribution, Nicholas Quigley of R.L.M. Resiliency Preparatory Academy and B.M.C. Durfee High and Tawnya Smith of Boston University share their experiences as mentee and mentor, respectively, to offer a deeply personal account of how Quigley came to a richer understanding of music pedagogy while engaging with students in the natural world. Their vignettes, photographs, and linked recordings bring key first-hand teaching perspectives to this issue.

In the third contribution, Christian Morgner of the University of Sheffield draws on recent critical theory and a close reading of a song by the heavy metal band Metallica to draw a distinction between a pre-modern conception that placed music within the sphere of natural philosophy and more recent developments where the earlier presumed connection between music and the divine has been broken. As he argues, self-referential music, in which environmental concepts are drawn directly from the music itself, offers both possibilities and challenges for musicians and activists.

In our fourth essay, Hao Huang, a composer and Professor of Music at Scripps College, outlines a plan for interdisciplinary music education for advanced high school and college students. Drawing on fields such as ecomusicology and zoömusicology, he argues that a well-developed interdisciplinary music education program can help students develop a richer connection to the non-human world, a connection much needed as we collectively face the loss of nature in the wake of global warming.

In the final essay, Maine-based librettist and poet Megan Grumbling of the University of New England shares her experience working with contemporary composers to create operas with environmentally-inflected themes. The lyrics and linked recordings in her essay remind us that the performing arts can awaken us to the fragile natural beauty of our shared planet. The essay musically takes us into the world.

Since its first issue in 2012, *Impact* has been committed to publishing essays and reflections that cross disciplinary boundaries. The essays in this issue remain true to that spirit, with contributors utilizing citation formats and methodologies appropriate to their fields. Taken together, they offer a multifaceted vision of how music, song, and imaginative thinking can offer both warning and hope at a time of ecological crisis. Above all, we hope these pages will inspire teachers, researchers, and performers to embrace the many ways that talking about, listening to, and making music might lead us toward a more sustainable future.

Best,

Adam Sweeting,

Associate Professor of Humanities
Boston University College of General Studies
Guest Editor

ABOUT THIS ISSUE'S AUTHORS AND EDITORS

Marcus P. Adams is Associate Professor of Philosophy at the State University of New York at Albany and former associate editor of the journal *Hobbes Studies*. His research focuses on perception and natural philosophy in early modern philosophy, in particular on these areas in the thought of Thomas Hobbes and Margaret Cavendish. He has recently edited *A Companion to Hobbes* (Wiley-Blackwell, 2021), and his recent papers have appeared in journals such as *British Journal for the History of Philosophy*, *History of Philosophy Quarterly*, and *Philosophers' Imprint*.

Colin A. Anderson is the George and Arlene Foote Chair in Ethics and Values and Professor of Philosophy at Hiram College in Ohio, where he also serves as the coordinator of liberal education. He received a Ph.D. from Loyola University of Chicago and his B.A. in Liberal Arts from St. John's College in Annapolis, MD.

Amanda M. Brian is Associate Professor of History at Coastal Carolina University in Conway, SC. Brian has published several articles on the history of visual culture, often as it pertains to modern German children, in such venues as the *Journal of Popular Culture*, *German Studies Review*, and *Central European History*. Her current research project involves the visual culture surrounding children's health and hygiene in nineteenth-century Germany. At CCU, she teaches much and broadly in world history and modern European history, and remains grateful for supportive colleagues in her department and college.

Lindsay Fleming is a research assistant in the Department of Psychology at McGill University. Her research interests lie in the perceptual, cognitive, and affective processes that evoke emotions, judgments, preferences, movement, and memory in response to music and art.

Megan Grumbling is a poet who often collaborates on environmental themes with musicians, composers, sound and installation artists, and filmmakers. She is librettist of the 2016 opera *Persephone in the Late Anthropocene*, a co-creation with composer Denis Nye and has collaborated on several environmental compositions with the composer Marianna Filippi. She is the author of the poetry volumes *Persephone in the Late Anthropocene* (Acre Books, 2020), an expansion of her libretto, and *Booker's Point* (UNT, 2016). Her awards include the Poetry Foundation's Ruth Lilly Fellowship, the Vassar Miller Prize, the Robert Frost Foundation Award, and the Maine Book Award for Poetry. She teaches environmental literature and nature writing at the University of New England, and lives in Portland, Maine.

Hao Huang is the Bessie and Cecil Frankel Endowed Chair in Music at Scripps College. He was the 2012-13 American Council on Education Fellow-in-Residence at Queens College CUNY and served as a United States Information Agency Artistic Ambassador on several overseas tours to Europe, Africa and the Middle East. He has published articles in refereed journals in Great Britain, Hungary, Greece, Japan, Russia, China and the USA. His performances and scholarly work have been recognized by *The Chronicle of Higher Education*, the *Washington Post*, and National Public Radio's *Morning Edition*.

Daniel Levitin is a neuroscientist, cognitive psychologist, and bestselling author. He is Founding Dean of Arts & Humanities at Minerva University in San Francisco, and Professor Emeritus of Psychology and Neuroscience at McGill University in Montreal. His research encompasses music, the brain, health, productivity, and creativity. He is the author of *This Is Your Brain on Music*, *The World in Six Songs*, *The Organized Mind*, *A Field Guide to Lies*, and *Successful Aging*.

Christian Morgner is Senior Lecturer in Cultural and Creative Industries at the University of Sheffield, United Kingdom. He previously served as Lecturer at University of Leicester and Research Affiliate at the University of Cambridge. His research centers on the role of meaning-making in various artistic contexts, such as arts festivals, creative cities, networks, and works of art. Most recently, Oxford University Press issued his book *The Making of Meaning: From the Individual to Social Order* (2022).

ABOUT THIS ISSUE'S AUTHORS AND EDITORS

Nicholas P. Quigley (they/he) teaches music and music technology at Resiliency Preparatory Academy and B.M.C. Durfee High School of Fall River, MA. An active composer, producer, and guitarist, Quigley has released multiple records of classical chamber music, alternative songs, soundscapes, ambient guitar works, and electronica. Their research on DIY musicking and pedagogies centering on expressive arts integrations and trauma-informed teaching have appeared in the *Journal of Popular Music Education*, *Massachusetts Music Educators Journal*, and *Teaching Music*, respectively.

C.L. Quinan is Senior Lecturer of Gender Studies at the University of Melbourne. Working at the intersection of trans studies and queer theory, their research examines how anxieties around race and nationality come to be displaced onto queer, trans and gender diverse minority subjects. They are the author of the monograph *Hybrid Anxieties: Queering the French-Algerian War and its Postcolonial Legacies* (2020) and co-editor of the volume *Homonationalism, Femonationalism, Ablenationalism: Critical Pedagogies Contextualised* (2021).

Tawnya Smith is Assistant Professor of Music Education at Boston University, where she teaches graduate courses in research, curriculum, arts integration, and undergraduate courses in healthy classroom dynamics, and arts and the environment. Her research focus includes arts integration, trauma and mental health, and ecojustice education. She has published widely in the fields of music education, and her work has appeared in numerous collections such as *The Oxford Handbook of Musical Performance Resilience in Music Education*. She is co-author of *Performance Anxiety Strategies*, co-editor of *Narratives and Reflections in Music Education: Listening to Voices Seldom Heard*, and Senior Editor of the *International Journal of Education & the Arts*.

Adam Sweeting is Associate Professor of Humanities in the College of General Studies at Boston University, where he also leads interdisciplinary seminars on environmental topics at BU's Kilachand Honors College. He is the author of *Reading Houses* and *Building Books* and *Beneath the Second Sun: A Cultural History of Indian Summer*. He co-edited an essay collection on environmental literature and co-authored an interdisciplinary textbook linking literature, art, and music for use in college classes.

ANNOUNCEMENTS

Latest Announcements

***Impact* Essay Competition**

Every December, the editors of *Impact: The Journal of the Center for Interdisciplinary Teaching & Learning* invite submissions of scholarly and creative non-fiction essays between 1,000 and 5,000 words on any aspect of interdisciplinary teaching or research. The author of the winning essay will receive a \$250 award and publication in *Impact*.

Essays should be readable to a general, educated audience, and they should follow the documentation style most prevalent in the author's disciplinary field. Essays for this contest should be submitted by the first Monday in December to citl@bu.edu. See our general submission guidelines in Submittable.

CITL reserves the right to not publish a winner in any given year. Faculty and staff from the College of General Studies are not eligible to submit to this contest.

ESSAYS

Waking Up to No Sound: Music Psychology and Climate Action

Lindsay Fleming and Daniel Levitin, McGill University

Maybe we underinvested in research on human behavior.

Dr. Francis Collins (PBS, 2021)

INTRODUCTION

More than 20 years ago, Stuart Oskamp (2000) posed the question *How can psychology help create a sustainable future for humanity?* Music psychologists have yet to respond. While it may seem naïve to assert that music can solve the climate crisis, it is irresponsible to assume it has no role (Prior, 2022; Publicover et al., 2019). Music is a cultural universal and for centuries has been used to bind people together, change their minds, and promote participation in group enterprises for social change (Levitin, 2008). Incorporating music psychology principles into climate action campaigns, educational programs, and community engagement initiatives can tap into the emotional, cognitive, and social aspects of human behavior, fostering a deeper connection to environmental concerns and inspiring positive changes for a more sustainable future.

Climate change represents the most serious threat to survival in all human history. It is already responsible for more heat waves, extreme weather, the spread of disease, increasing pollution, and reduced productivity (IPCC, 2022). In addition to direct effects like storms, floods, and fires, we are facing indirect effects including decreased crop yields, overwhelmed water systems, hospital shutdowns, loss of homes, and increased mental health problems. Climate scientists unanimously and unequivocally agree: the increase of CO₂, methane, and nitrous oxide in the atmosphere over the industrial era is the result of human activities. We cannot afford to underinvest in research on human behavior.

The field of environmental psychology has emerged to study human behavior in relation to climate change. Environmental and climate psychologists research ways to change destructive behaviors and embrace beneficial ones, such as recycling, using public transportation, and enhancing energy efficiency. Their research explores people's attitudes toward environmental issues, the factors that determine those attitudes, and how those attitudes affect behavior. Other behavioral scientists, including music psychologists could, and arguably should, help to identify drivers of awareness, concern, and action; sustainability professionals can, in turn, leverage this knowledge to deliver evidenced-based climate programs.

THE POWER OF MUSIC

Musicians, music psychologists, and music therapists recognize the power of music to influence our emotions, moods, thoughts, wellbeing, identity, and behavior. Music moves us emotionally (Juslin, 2019; Juslin & Sloboda, 2010) through listening and performing (Gabrielsson, 2011; Lamont, 2012). We use it for mood regulation (Baltazar & Saarikallio, 2016; Saarikallio & Erkkilä, 2007), social bonding (Savage et al., 2021), and to enhance our experiences of tasks (Clarke et al., 2010) and wellbeing (Levitin, 2019) in everyday life. Music influences both the content and valence of our thoughts (Koelsch et al., 2019) and forms a crucial part of our individual and collective identities (Hargreaves et al., 2017).

When we perceive the emotional and psychological content of music, we interpret the thoughts and feelings of others—encouraging altruism, compassion, empathy, and pro-social decisions (Clarke et al., 2015; Fukui & Toyoshima, 2014; McDonald et al., 2022; Wu & Lu, 2021). When Kirschner and Tomasello (2010) examined the relationship between collaborative music making and helping behaviors in 4-year-olds, they found children who made music with their peers were more helpful than those who only chatted with others. Similarly, experiments in our lab showed that playing music together increases empathy in young adults. Based on the well-established phenomenon that people who feel empathy for one another dislike seeing one another in pain, we set up a cold pressor test—one participant held their hand in a bucket of ice water (0 – 4 degrees Celsius) for as long as they could while a second participant watched. When the participant was a close friend—someone they'd known for five years or more—the onlookers' ratings of distress, discomfort, and empathy

ESSAYS – CONTINUED

were higher than when they were a stranger. But asking strangers to play the musical video game *Rock Band* together in cooperative mode for 20 minutes before the cold pressor task brought on levels of empathy equivalent to being friends for five years (Martin et al., 2015).

HOW CAN MUSICIANS CREATE A MORE SUSTAINABLE FUTURE?

Music is often used to impart urgent and important messages about the environment. The United Nations Environment Programme (2016) calls music “one of the most powerful media to communicate environmental messages to billions of people worldwide – irrespective of race, religion, income, gender, or age.” Organizations such as Artists and Climate Change, Climate Music, and the David Suzuki Foundation encourage musicians to create pro-environmental works. In early 2020, the *New York Times* analyzed lyrics from all artists who had appeared on any of Billboard’s domestic charts between 1999 and 2019. Kendra Pierre-Louis (2020) reports a total of 192 unique references to climate change. Two-thirds of those came between 2009 and 2019—the hottest decade on record at that point.

Many professional musicians also reduce their own impacts on the environment by avoiding plastic packaging, powering events with green energy and reducing air travel, as Jennifer Publicover and her colleagues at Dalhousie University observe (2019). REVERB (2023), a non-profit that advocates for sustainability within the music industry, reports that it has helped reduce the environmental impacts of over 330 major tours and 6,800 concert events. REVERB works with artists like Billie Eilish, Jack Johnson, P!NK, Maroon 5, Dave Matthews Band, Harry Styles, and Fleetwood Mac to fight carbon pollution, educate fans about the climate crisis, and put an end to related harmful practices.

Coldplay exemplifies the extent to which artists can go to achieve such ends. According to the band’s website (2023), their 2022 “Music Of The Spheres” tour reduced CO₂ emissions by 47% compared to their 2016-17 stadium tour. In 2023, they further reduced emissions by running the entire show from an electric battery system (charged by fans on power bikes and kinetic dance floors), using electric vehicles and alternative fuels, and limiting waste and plastic use. Fans are encouraged to travel to shows by foot, bicycle, public transport, and ride-shares. On site, they are encouraged to use recycling bins, bring refillable water bottles, and return wristbands for reuse. Additionally, for every ticket sold, the band planted a tree and made contributions to a range of environmental organisations like The Ocean Cleanup and ClientEarth.

HOW CAN MUSIC PSYCHOLOGISTS HELP?

Music psychologists have not yet studied the influence of such actions on the part of musicians or pro-environmental musical messages; nor have we examined the mechanisms through which music might help us to address the climate crisis. However, Dekoninck and Schmuck (2022; 2023) demonstrate that followers of eco-conscious social media influencers show higher pro-environmental behavior intentions over time and participate more in political sphere-oriented and cause-oriented actions. The same may hold true for fans and followers of eco-conscious musicians, and music psychologists can provide further insight into human behaviors related to climate issues by exploring how music influences emotions, cognition, and behavior. We should examine the effects of music itself, as well as musical experience, engagement, and training, on a range of outcomes including our (a) awareness of the climate crisis, (b) concern for the environment, (c) pro-environmental behaviors, (d) climate anxiety, and (e) climate action self-efficacy (i.e., belief that our actions can make a difference). This research would contribute to our wellbeing and enhance educational programs by providing a better understanding of the role of music in the fight against climate change.

MUSIC AND CLIMATE ANXIETY

Much psychology research focuses on the mental health outcomes following an acute climate change hazard such as a flood, earthquake, wildfire, or hurricane. The mental health impacts of climate change can be direct, indirect, or vicarious (Akresh, 2016; Berry et al., 2010; Cianconi et al., 2020; Clayton et al., 2017; Hayes et al., 2018; Usher et al., 2019). Direct impacts include post-traumatic stress disorder (PTSD), depression, anxiety disorders, substance use disorders, and suicidal thoughts. Slow-onset impacts of climate change (e.g., consequences on the economy, migration, drought, melting permafrost, and sea-level rise) indirectly affect stress, grief, anxiety, and depression. Even people who witness the effects

ESSAYS — CONTINUED

of climate change vicariously through the media can experience negative mental health effects like panic attacks, insomnia, or obsessive thinking.

There is much less research on these vicarious effects of climate change, but scholars agree that knowing about climate change and its consequences can trigger guilt, sadness, anger, and “psychoterratic syndromes”—a term coined by the philosopher Glenn Albrecht (2011; 2012) to denote mental conditions arising from our relationship with the natural world. Writing for the APA, Susan Clayton and her colleagues (2017) recognize eco-anxiety as a “chronic fear of environmental doom.” Susan Koger’s team at Willamette University (2011) describes eco-paralysis as feeling unable to mitigate or stop climate change. Solastalgia, another term coined by Albrecht (2007; 2011; 2012), denotes feelings of homesickness and distress in witnessing ecological changes to one’s home. Cunsolo and Ellis (2018) define ecological grief as the mourning of ecological loss or anticipated losses of land, species, culture, sense of place, cultural identity, and ways of knowing. Psychoterratic syndromes are not mental health diagnoses and are not considered pathological problems because experiencing low levels of anxiety and distress in the face of climate change is a normal response to a stressful reality. However, for some people, eco-anxiety limits daily activities and leads to symptoms of clinical depression and anxiety (Doherty, 2018; Pihkala, 2018, 2020; Rosen, 2020). Strong emotional responses to climate change can lead to action and mobilization, empowering people to change their habits and help the planet, or a debilitating paralysis when facing the immensity of the problem. When people learn about climate change without acquiring the tools to cope with the emotions that accompany this knowledge, they may experience hopelessness and denial.

We anticipate that music will transform awareness to action rather than immobilization and dread because it reduces anxiety under other high-stress conditions. Such conditions include coronary heart disease (Bradt et al., 2013), mechanical ventilation (Bradt and Dileo, 2014), cancer (Köhler et al., 2020), and invasive surgical procedures (Kühlmann et al., 2018). Music also reduces anxiety levels in people diagnosed with general anxiety disorder (Gutiérrez and Camarena, 2015) and panic disorder (Feldman et al., 2016). Music listening also increases self-efficacy (Gupta and Singh, 2020; Krause and North, 2016). Stefan Kölsch and his colleagues (2019) report that listening to heroic-sounding music, such as Epic Soul Factory’s “Legendary” or Fearless Motivation’s “Addicted to Success,” can evoke positive, exciting, constructive, and motivating thoughts. If music similarly reduces eco-anxiety and increases climate self-efficacy, there will be far-reaching implications for public health, music therapy, clinical psychology, education, activism, and climate science communicators.

MUSIC AND CLIMATE SCIENCE COMMUNICATION

Humans have transmitted information across generations through oral traditions like storytelling and song for tens of thousands of years. Stories and songs constituted the fundamental pedagogical devices of preliterate societies. Reliance on stories for millennia has evolutionarily hardwired and predisposed human brains to think in story terms. What Daniel Levitin (2021) calls “knowledge songs” preserve and transmit information about fitness hazards, ethnobiological knowledge, food gathering, morality, mythology, kinship, medicine, and practical skills.

Dahlstrom (2014) shows that storytelling increases understanding, interest, and engagement of non-expert audiences. Yet, Katz (2014) points out that scientists generally approach storytelling with caution and concern about scientific accuracy and distortion within the media. Such hesitations limit the potential of storytelling techniques in communicating climate science. Success stories and insights from cognitive science, neuroscience, and evolutionary psychology have advanced storytelling in other fields. Boal and Shultz (2007) demonstrate this in the workplace, while Palacios and colleagues (2015) explore the role of storytelling in healthcare. Anthony Leiserowitz, a human geographer and the director of the Yale Program on Climate Change Communication, researched the effect that watching the disaster movie “The Day After Tomorrow” had on viewers’ climate-related risk perception. Though the film takes many liberties with both science and reality, Leiserowitz (2004) reports film watchers became more engaged with the subject and learned important new ideas about climate science.

Music psychologists have yet to investigate the influence of storytelling through so-called “climate music” on listeners’ ecological worldviews, their awareness of the environmental consequences of specific actions, their ascription of respon-

ESSAYS – CONTINUED

sibility, their pro-environmental personal norms, and their day-to-day environmental behaviors. Wodak (2018) differentiates between musical works that “communicate” climate change and those that “convey” climate change; the former involves more literal representations of climate change data and is associated with scientific culture, while the latter involves more “evocative and poetic representation” associated with popular culture. Hill (2014) describes a third category of climate music encompassing works within acoustic ecology—recorded sounds from a range of ecological settings that explore the relationship between people and their acoustic environment. Does music from these three categories differentially influence behaviors and beliefs? If so, what features characterize the most effective music?

This line of inquiry has implications for musicians, educators, and activists. We suspect that creating, teaching, and sharing appropriate music will enhance the effectiveness of climate action campaigns and make environmental responsibilities more salient. Incorporating memorable tunes or catchy jingles related to climate action and environmental responsibility will improve information retention and recall, making it easier for individuals to adopt and apply eco-friendly behaviors. Levitin (2006) writes that musical elements such as tempo, harmony, and melody can influence how messages are perceived and remembered. In advertising, music plays an integral role in content recall, intentions to buy the product, and attitudes toward the advertisement and brand (for a review, see Raja, Anand, and Allen, 2019). The timbre, tempo, lyrics, genre, mood, and valence of the music might fit the message to reinforce it. For example, the first single from The 1975’s “Notes on a Conditional Form” features a somber piano melody backing the voice of Greta Thunberg reciting her speech at the World Economic Forum in Davos, Switzerland in January 2019. Alternatively, the musical features and message might be mismatched to capture attention. Childish Gambino’s “Feels like Summer” has the upbeat sound of most songs of summer, while the lyrics convey a more ominous message.

MUSICAL ENGAGEMENT AND ENVIRONMENTALISM

Moving beyond the features of music itself, we must also consider the influence of musical training, engagement, experiences, and preferences. Wu and Lu (2021) posit that music education promotes the development and maintenance of empathy and social understanding. It may follow that musical sophistication—musical skills, expertise, achievements, and related behaviors—correlates positively with environmental awareness, concern, and responsible behavior. Music psychologists have not studied whether musical sophistication predicts knowledge of climate issues, concern for the planet, and environmentally responsible behaviors; nor have we studied the relationship between different subscales of musical sophistication (active engagement, emotion, perceptual abilities, singing abilities, musical training) and environmental behaviors. If engaging with music (and musical training specifically) leads to pro-environmental behavior, all the more reason to teach it across all levels of schooling!

Collective musical experiences and shared musical preferences foster a sense of community and common identity (Andy, 2015; Hargreaves et al., 2017; Schäfer and Eerola, 2020). Social norms within such communities can influence sustainability behaviors. Aronson and O’Leary (1982-1983) show this for water conservation, while Cialdini and Reno (1990) demonstrate the influence of social norms on proper disposal of litter. As Publicover (2019) argues, music communities serve as an informal network for the social diffusion of pro-environmental values and norms. The social tendencies of a specific genre’s fans might be leveraged to encourage pro-environmental actions. Musical tastes correlate with a wide range of socio-demographic variables, including environmentally responsible behavior. For example, North and Hargreaves (2007) share that fans of soul are more likely to be vegetarian/vegan than fans of other genres, while fans of country and western, sixties pop, classical music, and opera recycle more. Pairing certain songs or genres with environmentally responsible actions could create positive associations that encourage individuals to engage in these behaviors more consistently.

CONCLUSIONS AND FUTURE DIRECTIONS

Much research is needed to evaluate both the reach of current music projects and their impact on audiences. Beyond emotional engagement and memorability, what are the characteristics of music that best motivate individuals to act? What audiences are best suited to receive or respond to musical engagement, and what audiences are most neglected by such

ESSAYS – CONTINUED

outreach efforts? Finally, what supports do music psychologists need to expand their work into climate engagement? While much work remains to be done, music is clearly an important—in fact, an essential—part of successfully engaging the public in climate action.

Climate change poses a multifaceted threat to our planet and our mental well-being, leading to a growing need for innovative solutions that can bridge the gap between awareness and action. Music, with its profound ability to evoke emotions, shape attitudes, and foster collective identity, holds immense potential in this regard. Behavioral scientists, including environmental and music psychologists, should join forces to explore the impact of music (and the arts and humanities more generally) on our response to environmental issues. By understanding how different genres, musical elements, and levels of musical engagement influence our environmental awareness, concern, and behaviors, we can unlock new strategies for fostering a more sustainable future. Music's capacity to reduce anxiety and increase self-efficacy suggests it may serve as a powerful tool in mitigating eco-anxiety and empowering individuals to take meaningful climate action. By integrating music into climate action campaigns, educational programs, and community engagement initiatives, we can tap into emotional and cognitive motivators of human behavior, fostering a deeper connection to environmental concerns and inspiring positive changes.

AUTHORS' NOTES

The title of this article comes from Childish Gambino's 2018 hit "Feels Like Summer." The lines *Air that kill the bees, that we depend upon / Birds were made for singing, waking up to no sound* are reminiscent of Joni Mitchell's criticism of the use of DDT in her 1970 hit "Big Yellow Taxi." Mitchell's lyrics include the stanza *Hey, farmer, farmer / Put away that DDT now / Give me spots on my apples / But leave me the bird and the bees / Please!* (inspired by Rachel Carson's *Silent Spring*). The opening quote "Maybe we underinvested in research on human behavior" was outgoing NIH-director Dr. Francis Collins' response when asked what the NIH could have done differently during the COVID-19 pandemic.

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ESSAYS — CONTINUED

Re-Educating and Rewilding: Learning to Listen Honestly as a Music Composer/Educator

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Tawnya D. Smith, Boston University

As musicians and educators terrified about environmental degradation, we acknowledge the need to make our practices more sustainable. Over the course of our relationship—initially that of a master’s student (Nico) and professor (Tawnya) and now as colleagues—we have become increasingly aware of the impending collapse of the unsustainable systems in which we are entangled and have discussed ways to contribute healthfully as we fulfill our niche in the social and biological ecosystems we cohabitate (Smith “Trauma of Separation” 179–180 and “Surviving and Thriving” 7). We have also engaged in a critique of Western industrial notions of extraction and dehumanization reinforced by schooling (Martusewitz et al. 1–20). To move beyond these limitations, we independently completed graduate-level expressive arts certificates (Rogers 1–3) to shift from a performance-centric music education approach to one focused on wellbeing.

As musicians and expressive arts facilitators, we turn to art to reconnect our cognitive awareness with our bodies and emotions (Smith “Spiraling to Life” 335–351). Nico (they/he) is a multi-modal musician and educator who has self-released eight albums spanning the classical, electronic, and ambient realms. Drawing on their experience as an instrumentalist, vocalist, composer, and producer, they now focus on creating electro-acoustic music integrating digital synthesis, soundscapes, and generative composition elements. Tawnya is a music education researcher who focuses her inquiry using ecofeminist, ecojustice, and ecopsychological frameworks to consider ways that education can lead to lifeways that are sustainable, just, and foster wellbeing.

It is also natural for us to extend such opportunities to our students, who have only known a time of environmental crisis. Although repressing feelings about environmental crises may seem easier, music can remind us that we are alive and part of a greater whole—awarenesses we believe are essential to human survival and thriving. Thus, we turned to the activists and ecophilosophers Joanna Macy and Chris Johnstone (8–12), who developed a community-centric curriculum to help people work through fear, anger, and despair about environmental collapse and develop what they call “active hope,” as referenced in the title of their book. Such hope is not based on wishful thinking nor denial but on taking informed and inspired actions that support the Great Turning (6–8)—that is, the cultivation of a life-sustaining society—no matter whether one feels hope or can realistically expect such an outcome.

Macy and Johnstone remind us that despite environmental catastrophes, there is much to be grateful for. They encourage us to connect with the protective quality of gratitude to not lose sight of what is at stake nor become mired in despair. In a related book, Macy and Brown’s *Coming Back to Life*, gratitude practice (43–54) is followed by an honest assessment of situations that leads one to feel their “pain for the world” (55–79). Next is to expand awareness (83–156) and go forth with active hope (159–238). Tawnya (Smith “Spiraling to Life” 1 and “Surviving and Thriving” 7) was the first to apply Macy’s framework to music education and consider how music engagement might support this process.

Through autoethnographic inquiry (Ellis et al. 1–5), we depict the evolution of Nico’s musicking as his creative work and relationship with natural spaces developed organically and informed his composition and teaching practices. In what follows, Nico intermixes reflections with vignettes and links to albums and their covers to depict this evolution. Following the vignettes, we jointly interpret Nico’s journey using the Macy and Brown framework from *Coming Back to Life* (67). We share these reflections to highlight how musicians and educators might enact active hope through positive connections with Earth, sound, and students.

ESSAYS — CONTINUED

EARLY MARCH 2009, NORTH PARK, FALL RIVER, MASSACHUSETTS: LISTENING AS AN EARTH BODY

This vignette depicts how music and nature fostered a more profound sense of aliveness for Nico as an adolescent.

In high school, I remember walking in a local park while listening to music with earbuds. North Park has sprawling greens, rolling hills, and tall trees. As I walked and listened, the music led me to increase my pace as the sixteenth-note drumming built up to the melody. I was running! And jumping! The sun became exceedingly bright, and the green grass and leaves enmeshed me in the park. However, the grass was still brown, resting for the winter because it was early March.

While in North Park I accessed my feelings through music and movement and connected with my surroundings. I moved and listened as a body of and connected with Earth. Rigby (45) describes the “Earth body” as a living individual, cohabitating with all other human and non-human beings, and as Earth itself, engendering and dependent upon Earth’s various systems. Rather than seeing the present time literally, my Earth body was united with the sun’s life-supporting energy and perceived the ecosystem non-linearly. My Earth body did not see the dead of winter but the near rebirth of spring. I did not think anything of this; I was merely enjoying my free time as an adolescent. Reflecting on that experience now as a scholar-practitioner of eco-conscious arts and education, I appreciate the majesty of this memory.

My process of discovering the term “Earth body” describes what it is and how the rest of my philosophical and ecological shifts occurred. I wrote the term “Earth body,” assuming I had read it during my graduate work as an expressive arts student at Salve Regina University and that I would find the appropriate text to confirm my inclusion of the concept in this article. Ultimately, I discovered Rigby’s chapter after concluding that I had not yet read the term or concept in another text. However, Rigby described precisely what I had initially intended to convey. We arrived at the idea separately, inspired not by scholarly or professional pursuits but by organic connections with Earth. This discovery process mimics what is displayed using vignettes that I learned and unlearned simply by connecting with Earth. It was not until the end of this journey that I discovered how perfectly it aligns with Macy and Brown’s framework from *The Work that Reconnects* approach as articulated in their book *Coming Back to Life* (67).

JULY 2018, FALL RIVER, MASSACHUSETTS: EXTRACTIVE LISTENING

In this depiction, Nico shares how they once viewed nature from an anthropocentric perspective—looking for ways that nature could benefit themselves and other humans.

Red-winged blackbirds and yellow Cedar Waxwings sang and danced in shady trees on a warm July morning. I looked up with childlike awe as they enveloped me in their intricate chorus. I was light years away from the stress of work. “This should be recorded for a song,” I thought. “This could bring people such peace.”

In my early twenties, I worked to establish myself as a musician and educator. I worked several jobs to pay rent and had limited free time. I commuted all over metro Boston and rarely spent time in natural spaces. I eventually took a day off with my partner at her cottage and interviewed for a nearby teaching position. We visited the water at their cottage on the South Watuppa Pond to appreciate the scenery. My western industrial extraction economy mindset—still in survival mode—heard the soundscape not as an ecosystem I was part of but as a resource to be harvested for creative commodification.

LATE MARCH 2019, PORTSMOUTH, RHODE ISLAND: TUNING INTO THE SOUNDSCAPE

Here, Nico shares how their practice of recording soundscapes from their environment first emerged.

ESSAYS — CONTINUED

“There’s no way I live here,” I thought as I walked a railroad along Mount Hope Bay. I perceived the beauty of the water and the tangled overgrowth of winter-bare vegetation. Depeche Mode played in my earbuds for miles. The external soundscape seeped in during a quiet musical moment, bringing my attention to the birds who had been with me the whole time. I removed my earbuds and listened curiously. I was in a massive sonic cocoon. “This is incredible,” I thought, and quickly started recording with my phone.

In 2018, when I started my career teaching music in my hometown of Fall River, my partner and I searched for our first apartment together. The least expensive option was a town away, an attic in Portsmouth, Rhode Island. I loved walking along the nearby railroad, passing through miles of natural spaces. I walked countless hours, mostly without direct human interaction, enjoying the escape into nature while listening to music. This is where I started recording soundscapes for fun; I intended to use them in compositions but also enjoyed the time outdoors. I felt peaceful, joyous, curious, and inspired. My body was moving and resting, and I became conscious of how my movement and breath sounded as I tried not to taint the recordings.

MID-JULY 2019, GOOSEBERRY ISLAND, WESTPORT, MASSACHUSETTS: LEARNING TO LISTEN HONESTLY

Nico shares here how they approached nature recording from an extractive perspective as they looked for pristine soundscapes devoid of human sound and how that challenge led to philosophical and ecological shifts in their music-making and teaching.

“I give up.” “They should shut down those mini airports for hobby planes.” As I drove around Westport, I realized it did not matter how far into the wilderness I went to record; human sound would always be present, ruining my opportunities to capture soundscapes. “It’s a miracle anything survives with all this goddamn noise.” I pulled into a favorite walking space, Gooseberry Island. “I’m just going for a walk and not recording.” After walking half a mile and letting the sounds of wind, waves, and birdsongs quiet my flustered mind, I turned towards my car to fetch my microphone. “Since everywhere is ruined, that’s all I can do. That’s the piece.”

After months of walking and recording, I purchased a new microphone to make better recordings. I envisioned a piece of semi-ambient music to promote and conserve the beauty of my bioregion. Although I was more at leisure than work, I ultimately ascribed to the extraction economy goals of resourcing and commodifying. Through composition, I wanted to call others to act—a tension between extraction economy values and my desire to promote change that finally eased when I recognized its presence.

Because I desired a breadth of sounds from diverse locations without any human noise, I was drawn to notice more in what I heard. I expected the soundscapes to vary by location, but I also learned that time and seasons played similarly vital roles in determining a place’s sound. I noticed, too, that wherever my location, I was closer to people than I anticipated. Sounds from miles away alerted me to what I could not see. I began to worry about the impacts of noise pollution on wildlife. One day, after attempting to record the shore at Horseneck Beach but hearing small planes above, I went to nearby Gooseberry Island (Quigley, [“An Arts-Based Response to Various Pollutions of Gooseberry Island, MA”](#)) to regenerate. A starker artistic message emerged as I pondered the impossibility of recording non-human nature alone. I started honestly recording—accepting the soundscape of a place rather than seeking out what I thought a place should sound like.

The idea of responding to environmental degradation through music emerged naturally as I improvised on the guitar and manipulated effects to create noises they were not intended for. My feelings were externalized through this arts-based response process. I recognized in these creative moments that my consciousness was expanding and that I was learning. This, too, was my music education. It was a philosophical shift in my musicking.

Furthermore, I named the educational value—developing ecological consciousness through musicking—of these practices and imagined how to incorporate them into my teaching. It was an ecological shift in my pedagogy. I asked myself,

ESSAYS – CONTINUED

“How can I facilitate this kind of creativity, learning, and expansion of consciousness for my students? What would it sound like for them to create an arts-based response to environmental degradation?” This is when the idea for the Massachusetts Soundscape Project ([Donovan & Lyons Elementary Schools Class of 2023](#)) emerged, as detailed in the final vignette.



Figure 1: Album Cover – An Arts-Based Response to Various Pollutions on Gooseberry Island, MA (Original Soundtrack).

SEPTEMBER 2019, HOME STUDIO, PORTSMOUTH, RHODE ISLAND: EXPRESSION THROUGH PLAY

Here, Nico exemplifies the interconnectedness of their compositional and teaching practices—not only how their teaching is informed by composition but also how their composition is informed by teaching.

On a Saturday morning in my home studio, I opened a leftover project file on my computer containing sound-scape recordings. I started auditioning other recordings, including guitar works, soundscapes, and project files with electronic sounds. I imported an atmospheric guitar recording and layered it with the existing soundscapes. The project still had several minutes of soundscapes, so the auditioning continued until I imported another guitar recording. After fiddling with effects and mixing, I listened several times, quietly smiling.

After amassing many recordings of soundscapes and other musical ideas in the summer of 2019, I spent weekends exploring and developing them. I also recorded new sounds. I never intended to compose that way; I usually started with a new idea that would eventually remind me of a previous, unfinished work. These compositions evoked feelings I did not directly express but deeply resonated with me (Quigley, [“Playing with Destroying”](#)). I played with sound and music similarly to how I encouraged my elementary students. The extended artistic practices of mixing and matching clarified and voiced shadow emotions, including dread, grief, culpability, adoration, and tenderness.

ESSAYS — CONTINUED

OCTOBER 2020, HORSENECK BEACH, WESTPORT, MASSACHUSETTS: TUNING INTO EARTH'S MUSICS

Nico describes here how their worldview expanded through the development of teaching materials using techniques initially developed as an eco-conscious composer.

Before a COVID-19 vaccine was available, my district's hybrid learning model required that I teach my elementary students in small groups and via video chat. Aside from teaching, I spent much of my time distancing from humanity, retreating to woods and beaches. Surrounded by the shoreline's sound, I found peace. "I wish I could experience this with my students." "This could be a class, somehow." I plugged in my microphone and started recording, trusting that a lesson would emerge. "A virtual field trip," I thought. "This could be a whole series!" I tuned into ocean waves, noticing the sounds of their crashes and recessions. I perceived when they were similar, when they changed, and how the volume fluctuated. I heard the length of each crash and recession and the differences in strength between each one. "This is the lesson."

Shevock (37) offers an eco-conscious philosophy of music education that connects to Earth, de-centers human musicking within the vast array of natural musics, and teaches about climate crises. Upon discovering his work, I was overjoyed at finally seeing a bridge between my climate anxiety and career, but I was unsure exactly how to cross it. My challenges were compounded by the early restrictions of the COVID-19 pandemic (i.e., hybrid instruction and in-person choral singing bans). Hoping to reach students and bring natural spaces to them, I created a website hosting media I gathered from local reservations.

I was also beginning my intermodal expressive arts training. I started to express myself through movement and visual arts and considered sound and music in new ways. From this came interdisciplinary lesson plans with non-musical artistic practices and the media I recorded. I was still commodifying the ecosystem for professional gains, but I was no longer aiming to position the ecosystem merely as an object. I considered how people interact with and learn from ecosystems. My worldview expanded from anthropocentrism toward interconnectedness. My teaching expanded from a human-centered approach to musicking towards the inclusion of studying music of the Earth.



Figure 2: Horseneck Beach State Reservation, Westport, Massachusetts. Photograph by Nicholas Quigley.

ESSAYS — CONTINUED

APRIL 2022, BLUE HILLS RESERVATION, RANDOLPH, MASSACHUSETTS: WORKING WITH STUDENTS

Here is a moment that exemplifies Nico's challenges, confronting learned behavior and ways of thinking reinforced by feedback from the perceived majority.

"Would leaves be a biophonic or geophonic sound?" a third grader asked. "Hmm. If they are alive on a living tree, that would be a biophonic sound because those are the sounds of living things. But if they are crunchy leaves on the ground, or we hear those in the wind, we could put that in the geophonic category as part of the wind, a sound of the Earth's systems. But we hear the living leaves as part of the wind, too. What do you all think?" We eventually lined up and headed for the nearby trail with notebooks and pencils. "You can sit with a partner as long as you listen quietly." "Hey, that's too far; I can't see you over there." A cyclist dashed past, cueing my inner critic to rant, "This isn't music class," "There are reasons why nobody teaches this way."

Traditional music teacher education pedagogies can limit general music educators, and many are expected to perform a limited range of tasks within school ecosystems (Abril and Gault 5)—including producing school performances and developing standard music notation literacy. These goals do not provide much space for students to express themselves musically, constituting music miseducation that disconnects students from their imagination, culture, society, and ecosystem (Smith "Trauma of Separation" 173). Thus, I try to subvert them in my teaching. For example, as I experienced philosophical and ecological shifts through the arts-based response to environmental degradation (Quigley, ["An Arts-Based Response to Various Pollutions of Gooseberry Island, MA"](#)), I conceptualized a version that students could participate in, as described below. Similarly, in my pursuit of more humane and life-affirming teaching strategies informed by expressive arts practices, I applied what I learned in my graduate studies to my daily teaching and created a final project consisting of lesson plans generated at Salve Regina (Quigley "Expressive Arts in Music Education" 1).

MARCH 2023, LYONS ELEMENTARY, RANDOLPH, MASSACHUSETTS: RECOGNIZING THE HEALING QUALITIES OF MUSICAL PLAY

This final vignette unveils the Massachusetts Soundscape Project, a product of Nico's eco-conscious development as a musician and teacher leaning on Earth as a collaborator. It also shows how collaborating with students unlocked Nico's understanding of their healing and personal development through this process.

The students were irritated that I ignored their musical inclinations in Soundtrap. "Why can't I have the beat in it, too?" a fifth grader asked. I was burnt out after describing projected declines in Massachusetts bird populations to each fifth-grade class. Yet I remembered the aesthetic honesty I arrived at in 2019 and 2020 through the *Gooseberry Island* and *Playing with Destroying* albums. I remembered the satisfaction of playing with guitars and effects with my soundscape recordings. I realized that play was my protest. "Ok, so we will dive back into the project now, but it's nothing like before." I gave my students almost total freedom to work towards three broad goal options: "Tell the story of how the bird population will change, convey your feelings about what you learned through research, or imagine a different outcome."

From 2019 to 2023, I cultivated greater self-acceptance through expressive arts and reverence for the wild. Recognizing my wild nature allowed me to see and understand who I am and where I live. I had to hike my internal forest and hear my inner ocean to feel compassion. I attempted to care for and educate my students by teaching them about their local sounds and ecosystem through a creative digital music technology project. They were to audition and download birdsong recordings, construct a soundscape collage representing a chosen bird's present population in Massachusetts, and then a second representing that population's projected change by 2050. This task seemed straightforward, but the students—accustomed to basic electronic production, using loops, and recording—incorporated their other musical ideas. What they

ESSAYS – CONTINUED

were doing was creative, musical, and self-initiated, but it was not exactly what I initially had in mind. Eventually, I understood that my wild nature was called forth by what I heard and made in my compositions. I learned to access and release my anger, fear, and sadness to self-soothe and transform these feelings, as did my students ([Donovan & Lyons Elementary Schools Class of 2023](#)).

My music education was expanded through eco-conscious musical engagement, which I did not experience in my professional music and teacher education settings. However, it allowed me to bring more to the table as a teacher. My students not only learned about melody writing, harmony, instrumentation, digital synthesis, mixing, composition with found sounds, or other topics typically covered in a traditional music class. In the process, they used musical play to access, release, and transform climate anxiety while gaining a deeper understanding of their artistic identities. They applied a critical lens to what they heard and how they saw their world changing, and created music as a form of protest.



Figure 3: Album Cover – Massachusetts Soundscape Project.

GOING FORTH FROM AN EXTRACTION AND POWER-OVER TO AN ATTUNEMENT, EXPRESSION, AND POWER-WITH APPROACH

As these vignettes show, Nico's awareness changed as they attuned to their Earth body through musicking and teaching. Their inclination to extract and use nature shifted from what Macy and Johnstone call the separate or isolated self (85) to a more integrated understanding. Macy and Johnstone argue that by cultivating a more ecological self (91), one can see the world through new eyes and move from a "power-over" to a "power-with" form of engagement (101–115). Nico's philosophical shifts were precipitated by moments of attunement and gratitude for natural surroundings, as well as confrontation with pain caused by limited financial resources and access to natural spaces, sound pollution that prevented

ESSAYS — CONTINUED

untainted nature recording, the fear and isolation during the COVID-19 pandemic and grappling with the purpose of their career amid climate anxiety.

Through feeling their pain for the world and perhaps sensing their students' pain, Nico eventually saw with new eyes and went forth with new actions. This change was evident when Nico shifted from a power-over approach to composing, where they stopped imposing forms and structures and started to play with sound; and in their teaching, when they allowed students more freedom to convey crises and potential solutions through their compositions. Further evidence of a shift occurred as Nico started integrating expressive practices in their composition and teaching, allowing further opportunities to travel the spiral through “anger, fear, and sadness” and towards opportunities for transformation and healing. By traveling the spiral of gratitude, feeling pain for the world, seeing with new eyes, and going forth with inspired actions, perhaps musicians can bring forth musical ways to reconnect with the ecological self, maintain present awareness of their emotions even when ecological catastrophes make that extremely difficult, see with less anthropocentric perspectives, and engage in forms of active hope despite the challenges we face.

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ESSAYS – CONTINUED

Musical Autopoiesis and Its Relationship to Nature, Environment, and Environmental Issues

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ABSTRACT

The paper invokes the concept of autopoiesis or self-referentiality to provide a new understanding of the relationship between nature, environment, environmental problems, and music. As noted in the existing literature, contemporary music increasingly references environmental change, but it remains unclear how we might conceptualize this relationship and these changes in the musical landscape. To that end, the conception of music as mirroring supreme and divine nature and of music-making as a direct link to nature is contrasted here with the conception of music as self-referential. While the latter might seem to have lost this direct connection, it can be said to possess greater freedom in selecting its own subjects and themes. At the same time, this greater freedom imposes new constraints on music production, as evidenced by an analysis of a popular heavy metal song. We find, then, that connections linking music, nature, and environmental reform may result in a paradox, one that encourages environmental activism while simultaneously creating limits on such activism.

INTRODUCTION

This paper delves into the intricate relationship between nature and music through the lenses of autopoiesis and self-referentiality. The burgeoning research interest in the interplay between nature, environment, and music is exemplified by initiatives such as the National Musical Arts (NMA) BioMusic Program (see Gray, 2014). Such interest stems from the extensive incorporation of nature-related elements in contemporary music. Instances abound, ranging from the integration of sounds evoking nature, such as ocean waves and bird songs (as explored by Schafer in 2001), to the exploration of songs expressing environmental concerns (as examined by Hart, 2018), and research delving into the intricate relationships between music, sound, and the natural environment (a topic explored by Allen and Dawe, 2015).

While this burgeoning research landscape has enriched our comprehension of these multifaceted phenomena, there remains a lack of universally accepted conceptual or theoretical frameworks that could elucidate the intricate connection between music and nature, the environment, and environmental challenges, particularly for contemporary music. To that end, I propose the theoretical concept of musical self-reference or autopoiesis to elucidate this relationship. I have chosen this framework because it not only offers a greater theoretical potential to understand the constitution of music in contemporary society, but it also facilitates the comprehension of the burgeoning musical expressions related to environmental themes. It enables us to frame the relationship between music and nature and discern the broader implications for ecological concerns. Special attention is dedicated to distinguishing music as influenced by an external ontological notion of nature, prevalent in music theory during the “pre-modern” European world from 1300-1700, from the conception of nature emanating from within music based on the framework of musical autopoiesis.

In the first section, I outline some general considerations regarding music and nature (or music versus nature) and include a brief discussion of nature and environment as the primary aesthetic model for music-making during the period between 1300-1700. This emphasizes music’s externally induced relationship with nature and the environment. In subsequent sections, I focus on the importance of self-reference and autopoiesis in a modern musical context. The focus, here, is on music creation that delves into nature, the environment, and environmental issues from within the music itself. This discussion draws on a range of illustrative musical examples.

ESSAYS – CONTINUED

MUSIC AND NATURE FROM WITHOUT

Conceptions of music that dominated the pre-modern European world from 1300-1700 embedded music in a general worldview that emphasized the continuity of nature, humankind, and the divine. In this period, music was seen as a branch of natural philosophy, as defined, for instance, by John Bullokar (1574-1627): “Naturall Philosophy teaching the nature of all things, and containing besides Arithmetick, Musick, Geometry and Astronomy” (no page number). The term *nature* extended beyond plants, trees, and the uncultivated environment to encompass the universe and life itself, including the relationship between God and human beings. Nature was assigned this supreme status because of its divine creator. Consequently, the musician’s primary role was to imitate or complement that relationship with Gioseffo Zarlino’s (1517-1590) music theory or Josquin Lebloitte dit des Prez’s (c. 1450-1521) compositions being prime examples of that relationship (Carapetyan, 1946).

As Hans Blumenberg (18) notes, “Nature and ‘art’ are structurally identical” during the early modern period; that is, nature was the aesthetic model to be translated into music. For musicians and composers this involved uniting nature’s various realms (visible and individual, material and non-material) through the use of harmony (Huck, 2003; Prins and Vanhaelen, 2017). In his treatise on natural history, Francis Bacon (29, paragraph 101) asserted that only harmonious sounds could be referred to as music: “whereunto there may be harmony, which *sounds* are ever *equal*.” Nature was central to this concept because it represented the ideal form of harmony; consequently, many musical pieces described engagements with nature. For instance, the French *chace* or the Italian *caccia* (both meaning “hunt”) created music based on singing and melodies that imitated the sounds of a hunt, including the barking of dogs and the whooping of hunting horns, as well as the cannon, with voices “chasing” each other in musical imitation (Rich, 1970). In these examples, the sounds of the chorus, the instruments, and the dogs come together harmoniously. Birdsong imitations are another important instance of the incorporation of nature in the vocal music during this period. It was believed during this period that birdsong was the original source of human music, and the nightingale is often cited as the prime example musical composition – not only because of the complex sounds but because “the nightingale sings of Christ’s death and resurrection and is itself the symbol of the greatest love” (Rowland, 30).

As these examples suggest, nature exerted its influence on music from without. Nature, in this context, possessed a pre-established significance that music was meant to imitate rather than creating or inventing its own interpretations of nature. Consequently, musical composition adhered to a model constrained by these predetermined boundaries, preventing music from defining itself independently. This paradoxical relationship between music and nature becomes evident. On one hand, nature was regarded as the foundation upon which music stood, playing a vital role in its existence. However, this foundational quality also imposed limitations, restricting the expressive scope of music to predefined parameters.

SELF-REFERENTIAL MUSIC

Establishing the ontological foundation of music based on predefined meanings rooted in a divine nature poses challenges when applied to the conception of music in contemporary culture. To counter such an external definition of music, a theoretical framework that has gained prominence in recent years conceptualizes the unity of music, or its distinction from non-music, through the concept of self-referentiality.

There are three ways one might define self referentiality in terms of music (Bartlett, 1987). In the first, the term *self-referential music* can be applied to songs that reference themselves such as Prince’s *My Name Is Prince* or Queen Latifah’s *Icemen Law* (Fischer, 2016). A second approach conceptualizes self-referential music in terms of music that references other music through allusions or quotations (Bernhart and Wolf, 2010) or non-music (e.g. John Cage’s *4’33”*). A third paradigm conceptualizes this self-reference in terms of autopoiesis (Luhmann, 1987; de Carvalho, 1999, 2001; Chagas 2005). My focus here is on the third approach.

The term *autopoiesis* was coined by the biologist Humberto Maturana following a philosophical exchange regarding the distinction between *poiesis* and *praxis*. Maturana favored the concept of *poiesis* because it expresses more clearly how a

ESSAYS — CONTINUED

product can be the outcome of its own activity but not of simple self-sufficient activity. Such products are formed “through the basic circularity of their production of their components” (Maturana and Varela, 1980: XIV). For instance, a living cell cannot find within itself all the causes required for its own production, but it can control the selection of external causes by internal operations. When applying this idea to music, we can recall the meaning of the word ‘tone,’ which roughly means ‘tension’. This term signifies a difference between two entities; otherwise, there would be no tension. In other words, a musical tone or sound is not to be understood as a singularity but as an interval between two points in time. The identity or meaning of a musical tone or sound, in turn, derives from faded, future, or expected sounds.

Niklas Luhmann (104) summarized this idea of musical autopoiesis as follows: “the form of the musical work creates its own ‘reservoir’ of selection, a space of meaningful compositional possibilities, which the specific work uses in a way which is recognizable as selection.” The pre-modern conception of music, on the other hand, conceptualized music based on the external footing of divine nature. The self-referential or autopoietic form of music conceptualizes music as through itself. This does not mean that external circumstances could not impact on music, but these external circumstances would be determined by the autopoietic form of music and not some ontological footing.

MUSIC AND NATURE FROM WITHIN

In the following discussion, I apply the framework of autopoietic music to the concepts of nature and environment. Within this framework, music derives its identity or meaning from past, present, and anticipated sounds—a concept referred to as the autopoietic form of music. According to this perspective, music is perceived as a network of interlinked sounds, where each sound references and builds upon its predecessors and successors. Consequently, the meaning of musical elements is established in relation to both themselves and what they are not. It is within this context that we can distinguish a sound as music as opposed to something such as noise or language. When guided by this principle, diverse elements such as time signatures, tempos, scales, rhythm, tonality, and expectations regarding musical terms can be constructed. Once these expectations are firmly established, they create the potential for alteration or rejection. A classic example of this can be heard in atonal music, which breaks the traditions and expectations of traditional harmonious compositions.

This perspective sheds light on a transformative understanding. It challenges the traditional view of music as a branch of natural philosophy, where nature and environmental issues are perceived as external entities. Instead, this approach posits that the meanings of nature and environment are constructed within and through music. The shift towards musical autopoiesis emphasizes invention over imitation, as the meaning of music is continually shaped through recursive networkings. These recursive networkings are made possible by the open-ended multiplicity of sounds that allow for diverse combinations, such as the countless meaningful musical sequences that can be generated from a C major scale. Consequently, if music originates from within itself, it follows that it must invent meanings related to nature and environment based on these internal foundations. This conceptual shift challenges conventional notions and invites a deeper exploration of the intricate relationship between music, nature, and the environment.

A premodern listener who heard this autopoietic turn, in which music is produced through music, might conclude that the connection between music and nature had been lost. As discussed above, medieval music was based on a conception of divine nature. However, this close relationship to nature also meant that musical production was simultaneously constrained by that same relationship. However, while divine nature may no longer be understood as the source of musical meaning, contemporary music has infinitely greater freedom in its choice of subject matter. At the same time, it is also self-constraining in the sense that any musical piece must work within the context of other musical pieces if it is to be recognized as music.

Many current musical trends serve to illustrate this paradoxical simultaneity of freedom and constraint. Mason Bates’ 2009 “The B-Sides,” for example, blends electronic music with the traditional orchestra. “The B-Sides” incorporates sounds of nature such as recordings of crickets and birdsong into the electronic elements. The piece exemplifies the freedom to merge electronic and acoustic elements while conforming to the structure of an orchestral suite. In another

ESSAYS – CONTINUED

example, Björk's 2011 album "Biophilia," is an innovative project that combines music, technology, and nature. Each track explores a different natural phenomenon, demonstrating the freedom to experiment with both musical and thematic elements within the constraints of a conceptual album, a pre-existing format she inherited. Similarly, Bon Iver's 2011 "Holocene" explores themes of natural beauty and human connection within the context of indie folk music. The song incorporates intricate acoustic guitar patterns and ethereal vocals, thus demonstrating artistic freedom in lyrical expression and musical arrangement while adhering to the song writing conventions of the genre. As these examples show, the concept of musical autopoiesis can illustrate the ways contemporary music about the environment reveals the paradox of the freedom to experiment while simultaneously working within the restraints established by well-established genres.

A detailed examination of the heavy metal band Metallica's 1998 song "Blackened" offers a paradigmatic example of the complex dynamics of working with this tension. Indeed, even a casual listen to the song reveals the way the band intertwines the themes of nature and environment within the song's musical structure and lyrical content. In terms of the song's structure, the concept of self-production and self-maintenance aligns with the composition's repetitive and cyclical nature. The recurring riffs and rhythmic patterns create a self-sustaining musical structure that mirrors the idea of internal processes within an autopoietic system. These musical elements represent the foundational components of the song, analogous to the self-producing components of a biological system. The musical tones and intervals in "Blackened" represent the differences between forces and resemble the tension between nature and humanity depicted in the lyrics. The dissonant guitar riffs and intense drumming form intervals that symbolize the conflict between the natural world ("Death of Mother Earth") and human actions ("Deadly nicotine/Kills what might have been"). The musical tension reflects the discordant relationship between the two entities, thus emphasizing the ecological imbalance caused by human activities. One might even hear in the heavy guitar arpeggios the musical analogue of lyrics such as "death of mother earth – never a rebirth – evolution's end," a notion that exemplifies the existentialist themes common to heavy metal (Irwin, 2007).

The song's structure similarly embodies the circularity and meaningful compositional possibilities described in the concept of musical autopoiesis. The repetitive nature of the lyrics and musical motifs creates a reservoir of selection within the song. As the lyrics revisit themes of decay, termination, and human destruction, the song builds a recognizable pattern that reinforces the message of environmental devastation. This circularity emphasizes the inescapable nature of the consequences humanity faces due to its actions against the environment.

The lyrics of "Blackened" recognize and utilize concepts related to environmental decay and human impact. The specific word choices and imagery such as "Deadly nicotine/Kills what might have been" and "See our mother put to death" serve as selected elements within the autopoietic system of the song. These selections contribute to the formation of recognizable patterns, shaping the song's thematic coherence and reinforcing the message of ecological crisis. In the autopoietic framework, the interdependence of musical elements and lyrical themes is crucial. The intensity of the music mirrors the urgency of the environmental message, creating an immersive experience for the listener. The dissonance and aggression in the music correspond to the direness of the environmental situation described in the lyrics, highlighting the symbiotic relationship between the musical composition and the lyrical narrative.

As is typical of heavy metal music, "Blackened" offers no meaningful explanation of the world. While there is no solution to be found in "Opposition...contradiction...premonition... compromise - Agitation...violation...mutilation...planet dies," the song expresses an existential transgression beyond good or evil. This is the genre's potency, and "Blackened" connects with and extends this heavy metal tradition. In that sense, self-referential music does not have the freedom of "anything goes" but is constrained by its own character. It must stabilize the meaning of the heavy metal music from within music while enabling a new projection of the environment as external to it. With the environment being on the outside of society it can be presented as being under threat from the forces external to it.

Based on such a construction, music can generate meanings that may lead to activism and greater ecological awareness (Prior, 2022). However, the construction of such meanings also has its pitfalls. For instance, the "popular" of popular music implies that it must reach a wide audience through examples such as medium-length songs in 4/4 tempo that are easily danced to, with repeated choruses and memorable lyrics. While a large audience can make music very powerful, it also

ESSAYS – CONTINUED

means that its subject matter – even environmental destruction – becomes easily consumable. Indeed, even “Blackened” is now used to sell whiskey (Micallef, 2020). As Adorno noted in a sharp and aggressive tone in an interview discussing popular songs about the Vietnam War (cited in Buchenhorst, 2021: 96), “then I consider this song unbearable by making the horrendous consumable, wringing something like consumption qualities out of it.” To be sure, the construction of the environment in music may create new meanings and encourage people to engage with the topic, but as Adorno notes in his critique of anti-war songs, there is the concern that ready-made meanings take away the pressure to engage with the deeply troubling topic of environmental problems. To summarize, musical autopoiesis is a useful concept to explain how music in contemporary society constructs the environment and environmental problems, which lead to new meanings and potential for social change, but likewise, the ways these meanings adhere to musical genre, styles, and other formats and thereby can have a tendency to package meanings so that they fit into existing standards.

DISCUSSION

The aim of this paper was to articulate a framework for understanding the relationship between nature and music. This seems warranted by the growing academic literature and the global expansion of this theme across all musical genres. However, it was also noted that a theoretical framework that can help us to understand the relationship between music and nature, the environment, and environmental problems has yet to be developed. To elucidate this relationship, the proposed framework centers on self-referential or autopoietic music. The brief foray into contemporary music and its links to environmental issues highlights the contrast with earlier conceptions of music intended to mirror divine nature. This part of the paper could show the direct relationship between music and nature. The section on the self-referential conception of music, however, breaks this direct link with any external or divine nature.

While the idea of an autonomous reservoir of musical ideas and themes might seem to distance music from environmental concerns, this self-determination also means that music has greater freedom in terms of theme, format, and sound and can therefore react more powerfully to environmental concerns. Paradoxically, the “loss” of nature means that environmentalism has expanded globally across all musical genres. However, music must also operate within its own context and traditions, which inevitably incurs a cost. The two cited examples of heavy metal and pop music illustrate how music engages with environmental concerns and opens new doors while also remaining dependent on the reproduction of music itself (e.g. musical genres or forms of consumption). This conception of music as autopoietic accommodates the paradoxical alignment of freedom, expansion and constraint, highlighting the complex relationship between music and environment and how music can both help and hinder environmental change.

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ESSAYS — CONTINUED

On Teaching About Music and the Environment

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Music is one of the most powerful media to communicate environmental messages to billions of people worldwide — irrespective of race, religion, income, gender or age.

United Nations Environment Programme (UNEP) Music and Environment Initiative, 2014

INTRODUCTION

Nearly a decade ago, the United Nations issued a powerful declaration about the efficacy of music to advocate for environmentalism, citing its ability to transcend humanity's many categories of difference. Nevertheless, as the old saying goes, "the devil is in the details," so implementation poses multiple challenges. Teaching about music and the environment jointly is an inherently interdisciplinary exercise. We might ask, then, what kind of approach will be productive? What is to be gained by teaching about music and the environment? In a world poised on the brink of catastrophic global climate change and its corresponding environmental, political, and social repercussions, humanity is at risk of losing our common interest in valuing our physical and spiritual circumstances.

Music presents potential remedies to resolving this existential crisis. Indeed, nearly a century ago, the music educator Satis Coleman (1939) taught her students about "nature's musics" extensively, beginning by recognizing that birds teach songs to their young, and later encouraging her students to use birdsongs as inspirations for their own improvisations:

Many people go through life deaf to some of the most beautiful sounds in Nature. They walk in the woods and never hear the soft crunch of their feet on the dry leaves, the whirr of the bird that flies overhead, or even the song which the bird sings when he alights in the tree. They never think to listen to the wind blowing through the branches or notice the musical babble of the stream rushing over the stones. And that delightful little time-beater of the evening, the cricket under the leaves — all this rare music is missed....(95)

This essay builds on Coleman's point to articulate how a program of environmentally inflected musical education can be developed to help upper-level high school and university students better understand their connections to the broader human and other-than-human communities.

ABOUT MUSIC

The academic discipline of music is inherently interdisciplinary. It incorporates studies in performance, music theory, music history, musicology, and ethnomusicology. These subdisciplines not only demonstrate disciplinary diversity, but each, in turn, embodies interdisciplinarity by combining different fields. For example, Aaron Allen (2012a) notes, "musicology itself is an interdisciplinary field, drawing on paleography, literature, mathematics, history, and cultural studies, among others, to say nothing of the performance and practice of various types of musical arts" (201). To complicate matters further, scholars and musicians have expressed disparate opinions about the meaning of music. Allen (2012b) confirms that "the terms *music*, *culture*, *nature*, and *environment* are complex terms that different people in diverse cultures—and even similar people in the same culture—can interpret in multifarious ways...." (377). Nevertheless, such multivalency is constructive because the resulting panoply of ideas, approaches, and contexts can be applied in multiple contexts.

A conventional definition of music holds that music is a conscious action of organized sound creation by human beings, to be received by listeners responding with an equally conscious act of decoding the meaning behind those organized sounds. In a 1939 Norton Lecture at Harvard, the early 20th century composer Igor Stravinsky declared:

ESSAYS – CONTINUED

[T]he pleasure we experience on hearing the murmur of the breeze in the trees, the rippling of a brook, the song of a bird. All this pleases us, diverts us, delights us. We may even say: ‘What lovely music!’ These natural sounds suggest music to us, but are not yet themselves music. If we take pleasure in these sounds by imagining that on being exposed to them we become musicians and even, momentarily, creative musicians, we must admit that we are fooling ourselves. They are promises of music; it takes a human being to keep them: a human being who is sensitive to nature’s many voices, of course, but who in addition feels the need of putting them in order and who is gifted for that task with a very special aptitude. In his hands all that I have considered as not being music will become music. From this I conclude that tonal elements become music only by virtue of their being organized, and that such organization presupposes a conscious human act. (23)

Within a decade of Stravinsky’s pronouncement, Pierre Schaeffer began to explore *musique concrète*, about which he wrote “the question was to collect concrete sounds, wherever they came from, and to abstract the musical values they were potentially containing” (qtd. in Reydellet 1996, 10). He often modified recordings through audio signaling processing and assembled them into abstract sound collages. In the early 1950s, composers began to explore the application of randomness in aleatory music (chance music), an experimental style that incorporated indeterminacy as a guiding principle of performance. As the composer Luciano Berio claimed: “Music is everything that one listens to with the intention of listening to music” (19). Stravinsky, however, did not attribute absolute power to intentionality. He counter proposed that listening involved a conscious attentiveness, cautioning in a 1957 interview with Deborah Ishlon, “To receive music you have to open the ears and wait, not for Godot, but for the music; you must feel that it is something you need. Some let the ear be present and they make no effort to understand. To listen is an effort, and just to hear is no merit. A duck hears also” (qtd. in Walsh 2008, 339).

Complementing Berio’s definition of music as that which listeners intend to experience as music, the academic fields of acoustic ecology and soundscape ecology study the listener’s perception of sounds heard as an aural environment. As the experimental composer David Dunn and music journalist René van Peer (1999) note:

Music is a means by which humans give back and communicate to the totality of that mind. In the daily circumstances of life, we are surrounded with a fabric of sound that is the voice of a generative source. When we make music, it is to match the level of that. Music is about matching the fabric that speaks to us on a daily basis. (65)

In acknowledging these widely divergent opinions, I advocate for a holistic view of music as sounds that express and communicate life experiences that are understood by human beings, including ambient and natural sounds, as well as those from musical instruments used in all cultures and genres. After all, most practicing musicians would agree with a statement from an 1851 issue of *The Literary Garland*: “Music begins where language ends; it expresses thoughts and emotions, to which speech can give no utterance” (Anonymous 472).

EXPLORING INTERSECTIONS OF MUSIC AND THE ENVIRONMENT

Drawing on ideas outlined by Hollis Taylor and Andrew Hurley (2015), I propose four relevant categories of intersections of music and the environment/ecology:

- Music that commemorates or evokes nature, time and place
- Music and environmental awareness and activism
- Soundscape studies and acoustic ecology
- Ecomusicology & zoömusicology

With regard to the first category, musical representations of nature and place abound in works such as Respighi’s “The Pines of Rome,” Grofé’s “The Grand Canyon Suite,” and Gershwin’s “An American in Paris.” Such works incorporate specific local environmental sounds such as birds or even car horns! Broadening the scope to a general appreciation of

ESSAYS – CONTINUED

nature, Beethoven's "Pastoral" Symphony speaks to his love of the countryside. As he wrote about its composition (qtd. in Wright, 2018):

How glad I am to be able to roam in wood and thicket, among the trees and flowers and rocks. No one can love the country as I do... my bad hearing does not trouble me here. In the country, every tree seems to speak to me, saying "Holy! Holy!" In the woods, there is enchantment which expresses all things.

The list of well-known Western classical works that evoke and commemorate the physical particularities of a specific place might also include *Années de pèlerinage (Suisse) and (Italie)* by Franz Liszt, whose melodies and textures evoke the Alps and alpine lakes; "The Blue Danube" by Johann Strauss II, with its rippling rhythms suggesting the graceful flow of that river; and the burgeoning springtime sounds of birdcalls and wildlife in Copland's *Appalachian Spring*. These represent but a sampling among myriad similar examples.

Of course, music that commemorates or evokes special qualities of place is not restricted to the West. Despite being a Western-trained classical pianist, composer, and writer, I can attest to the transcultural impact of natural environments on diverse musics across time and place. As an immigrant Chinese Hakka American child, I listened to traditional classical Chinese music that conveyed a sense of the natural world as home to a person who needed one. This included 瀟湘水雲 ("Mist and Clouds Over the Xiao-Xiang Rivers") from the Song Dynasty (960-1279 CE) and 平沙落雁 ("Wild Geese Descending on the Sandbank") from the end of the Ming Dynasty in the early 1600s CE. Memories of those works ultimately impelled me to write this article about music and the environment, and I'm ever mindful of how they might help others. (A selection of relevant traditional classical Chinese music can be heard in Shuishan Yu's 2009 CD, *Guqin Music: The Pure Sound of Mountain and Water*).

Of course, these works by no means represent a full list of non-Western environmental music. Other traditions that similarly often refer to nature and place include *Kankyō Ongaku* (ambient music), a Japanese genre of music that emerged in the 1980s in reaction to rapid urbanization; Australian Aboriginal Songlines that "sing" memories of the thousands of species of plants and animals along traditional walking routes through the indigenous Outback; and forms such as the "Adowa" (antelope) dance of the Ashantis (Abrokwa 1999). In yet another ethnomusicological example, Steven Feld (1994) describes the relationship between music cultures and the environment in his work with the Kaluli people of the Bosavi forest in Papua New Guinea. He conceives of that relationship as one of symbiosis, a reciprocity between the musical sounds of the Kaluli people and the bird songs of the forest: "My interpretation showed how Bosavi birds turn into Kaluli singers and weepers, how Kaluli singers and weepers turn into Bosavi birds, and how all of this is a local ecology of 'voices in the forest' (4). Such musical crossings of species identify and anticipate the core principles of zoömusicology. They expand the aspiration of crosscultural understanding and respect to cross-species awareness and reverence.

As for my second category of music that raises environmental awareness, we can identify numerous popular songs that have addressed environmental problems. Turner and Freedman (2004) cite examples such as Woody Guthrie's "Dust Bowl Blues," a song that evokes the midwestern drought of the 1930s; Joni Mitchell's *Big Yellow Taxi*, which calls out the destruction of nature through mass tourism; and Stan Rogers' "Make and Break Harbour," a song about the collapse of the Atlantic Cod fishery. Similarly, Shevock and Bates (2019) note that in "Mercy, Mercy Me [The Ecology]," Marvin Gaye asks, "Where did all the blue skies go?" and draws our attention to mercury in fishes, radiation, and overpopulation. And, of course, there's Malvina Reynolds' "God Bless the Grass," a song made famous by Pete Seeger that reminds us that the "will" of deep-rooted grass "is to grow."

These diverse musical works demonstrate that, despite the claims of Foucauldian discourses of power, musicians are not "fully administered" by oppressive systems of language and society: their creative power of musical invention allows them to be, in Tawnya Smith's terms, culture makers as well as culture bearers. As Smith (2021) argues, "Culture making within the environmental and cultural commons aligns with Shevock's vision of an eco-literate pedagogy where music is connected to 'local places,' is 'connected with nature in meaningful and ethical ways,' promotes 'ecological consciousness

ESSAYS – CONTINUED

by ritualizing and creating music rooted in soil,' and connects music makers to the planet by connecting the local to the global" (8). This presents a paradigm shift for musicians to act as co-creators of an ecological soundscape. And it allows music educators to assume roles not only as teachers of how to value and make beautiful sounds, but as caretakers of a performance art that can be used to rally people to confront the dangers of environmental destruction.

The third category of soundscape studies and acoustic ecology began in the mid-1960s, when Michael Southworth (1967) and Murray Schaffer (1977) each proposed the concept of soundscape as an immersive experience that draws on the natural acoustic environment. Soundscapes can draw from natural sounds such as animal vocalizations (biophony); the sounds of weather and natural elements (geophony); and the environmental sounds created by humans, both acoustic and mechanical (anthropophony). Such sounds offer powerful tools that could help human beings viscerally relate to their surroundings. Soundscape art and soundscape studies can, in turn, "make explicit the patterns and changes in our sounding world" and "raise awareness about the state of the world, as revealed through sound" (Cummings and Miller 2007). Indeed, musicians and music educators share common ground in teaching audiences and students to listen conscientiously with detailed focus so that they may become more mindful of their physical environment and its transformations.

Hildegard Westerkamp (2002) describes the relationship between soundscape and acoustic ecology thusly:

[O]nce we have accepted the acoustic ecology arena as the basis from which soundscape composition emerges, one could perhaps say that its essence is the artistic, sonic transmission of meanings about place, time, environment and listening perception.... [E]ach soundscape composition emerges out of its own context in place and time, culturally, politically, socially, environmentally and is presented in a new and often entirely different context....(52)

As these comments suggest, understanding the various parameters of a soundscape requires insights from several fields, including acoustics, ecology, and ethnography.

This provides a segue to the fourth category that centers around ecomusicology, which involves the study of music, culture, and nature from text-based and performatory perspectives. Pedelty et al. (2022) provide historical background: "ecomusicology is... a twenty-first-century phenomenon born of twentieth-century social and biophysical crises that have resulted from centuries of Western colonial and industrial projects" (4-5). They further define ecomusicological research as environmental, relational, systemic, explanatory, and crisis-oriented, integrating the disciplines of musicology, ethnomusicology, popular music studies, and acoustic ecology as well as environmental studies.

Aspirations to gain a holistic awareness of an ecological sound environment lead towards the field of zoömusicology, which studies the musical qualities of sound and communication as generated and recognized by non-human species. To quote Hollis Taylor (2011), "Zoömusicology is the human valorization and analysis of the aesthetic qualities of non-human animal sounds." This calls into question the definition of music as a product of conscious human organization of sounds that limits music-making and listening to humankind, which bespeaks a solipsistic form of anthropomorphism. Taylor and Lestel (2011) contend that "Eurocentric and anthropocentric musical assumptions and preoccupations have resulted in a paucity of studies of the sonic constructs and concomitant behavior of other species by musicologists" (57). By proposing to enlarge the scope of musical inquiry from cross-cultural to cross-species examination, zoömusicology's objectives are analogous to environmental concerns that extend beyond impacts on human beings to those on other living organisms. An unexpected bonus may be that we humans may finally learn to listen to what Stravinsky referred to when he asserted that "a duck hears also."

ESSAYS – CONTINUED

IDENTIFYING PRODUCTIVE INTERDISCIPLINARY MODELS OF THINKING AND TEACHING ABOUT MUSIC AND THE ENVIRONMENT

The *sine qua non* of interdisciplinary teaching is to make clear distinctions between interdisciplinarity, multidisciplinary and transdisciplinarity, which are often indistinctly differentiated in the liberal arts. Interdisciplinary teaching has been occasionally conflated with multidisciplinary pedagogical methods while fundamental differences between encouraging disciplinary integration and maintaining disciplinary integrity have not always been respected. For the purposes of this essay, I draw upon definitions outlined by Choi and Pak (2006) to advocate for an interdisciplinary teaching that examines and integrates connections between disciplines into a coordinated and coherent whole, whereas multidisciplinary extracts knowledge from different fields of study but operates within disciplinary limits. A common temptation found in interdisciplinary teaching exists in extracting knowledge from different fields of study without making a serious effort to synthesize them thematically or theoretically. I concur with Machiel Keestra's (2016) assessment that interdisciplinary approaches must integrate different disciplines by exploring links between subject theories, methods, results, and/or models (32). The primary challenge music teachers face is to find ways to use methodologies that integrate insights from diverse academic disciplines and experiential knowledge to produce socially relevant wisdom.

Reflecting on the ways that interdisciplinarity can inform eco-literate music pedagogy can guide teachers towards a philosophy of convergence that combines cultivating ecological consciousness by using methods and practices from different disciplines, and connecting those under the umbrella of valuing and preserving human and non-human life. Such teaching objectives offer opportunities to integrate subareas in music such as performance, sound studies, zoömusicology, and music education with biology, chemistry, anthropology, communication studies, bioacoustics, geography, political science, and sociology. Shevock (2015) suggests that in so doing, music educators can move beyond a focus on the purely sonic aspects of music to recognize and share the social and ecological inspirations connected to “musicking.” For instance, we can move beyond discussions of “why these notes” to a broader dialogue about what motivates musicians to make this music, whether individually or as a member of a group confronting the cultural, psychological, or economic impacts wrought by environmental damage. Music teachers can similarly explore the social and ecological circumstances involved in the creation of a musical work, an approach that could draw on data from social and natural sciences. This may lead to another question: What is to be done in our broader society?

A soundscape ecology approach to music learning offers environmental educators a chance to better balance an environmental literacy curriculum that often concentrates on the natural, physical, and social sciences at the expense of the arts and humanities. It can facilitate interdisciplinary connections between the biological and acoustical sciences in order to respond to the dual impulses of resistance and adaptation to climate change. For example, the emerging cross-disciplinary field of bioacoustics investigates sounds produced by or affecting living organisms. There are clear musical implications to such an approach. As Smith (2021) suggests, music education can expand the notion of music to include sounds created by people from other cultures as well as those generated by other-than-human beings. Listening and “musicking” in these unorthodox ways may enable students to become more aware of and attuned to the environmental conditions needed for humans and non-humans to flourish in our shared ecosystems.

CONCLUSION

To recapitulate, I argue for a program of interdisciplinary teaching that involves exposing high school and university students to both Western classical *and* World Musics that commemorate or evoke nature, time, and place – not only in their subject matter, but in terms of their musical sound as well. Such teaching involves discussing how composers and performers achieve those objectives. It also involves listening to popular music that encourages topical environmental awareness and activism through its lyrics. Exploring acoustic ecology and soundscape studies that center around transdisciplinary connections between music and the natural environment can encourage direct engagement with natural environmental sounds while also offering inroads into the scientific and historical context of those sounds. This may be a challenge, but if done well we will be sharing with high school and university students perspectives from ecomusicology and zoömusicology that can help them move beyond self-centered anthropomorphic thinking to develop deeper connec-

ESSAYS – CONTINUED

tions to the non-human species who inhabit our shared environment.

By teaching ways to listen to music about nature and music drawn from sounds of the natural environment, high school and university music educators can encourage students to become alert to interconnections between music, culture, and nature while simultaneously approaching our environmental crisis through a musical lens. Raising student awareness of the many music genres that convey environmental messages will not only enrich their sound worlds, but may also develop their ecological consciousness. Music educators may, in turn, find teaching music in this way self-benefiting and gratifying since it counters widely-held reservations about the relevance of music as a nonessential luxury. Teaching about music and the environment demonstrates that music can be scientifically, politically, chronologically, and ethically relevant. Finally, teaching about listening to and making music that relates to an environment in the context of a specific time and place can make students more keenly aware of sounds from local landscapes, which may lead to deeper understandings of how much there is to lose if we do not act to protect the students' habitat from environmental degradation and climate change.

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ESSAYS — CONTINUED

Initiation, Immersion, and Invitation: Three Environmental Compositions for Opera

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Since I was a small child, I've been inspired by the myriad intricacies of wings, tentacles, tendrils, roots, and all the other natural wonders all around us. As a poet, I've sought to cycle energy back into these systems, so to limn, praise, and nurture the natural world that still so inspires me. And as a librettist, writing words to be interwoven with music, I've found especially rich opportunities to engage with both the beauties and the crisis of our environment.

When I first began collaborating with composers, about 15 years ago—first with the late composer Denis Nye, of Portland, Maine, and later with the Copenhagen-based Marianna Filippi—I thrilled to the possibilities of pairing my words with music, particularly in environmentally-themed works. Since then, my operatic projects have included an ancient myth vaulted into the age of climate crisis, an homage to an octopus, and a choir to be sung in the voice of a glacier. In an environmental moment in which we too often feel afraid, despairing, and isolated, these collaborations have shown me that works of words married with music can allow us a more imaginative, intimate, and emotionally expansive engagement with complex ideas about nature and environmental crisis. As a collaborative and interdisciplinary mode, environmental opera can embody the ecological intricacies and symbioses that it often praises. And as performance, opera about the natural world can offer both artists and audiences an opportunity to sit with our environmental joys and fears in community and in communion.

In this essay, I discuss three environmentally themed compositions on which I've collaborated, each with a different subject, style, and rhetorical, literary, and musical approach. I describe these modes as Initiation, Immersion, and Invitation.

Initiation is the mode most central to the opera *Persephone in the Late Anthropocene*, which inducts audience-members as participants into and through a ritual story of climate crisis. Inspired by the Mysteries of ancient Greece, Initiation as a musical and narrative mode can help us to work through environmental difficulty or grief by reconnecting us to our core resilience, values, and love.

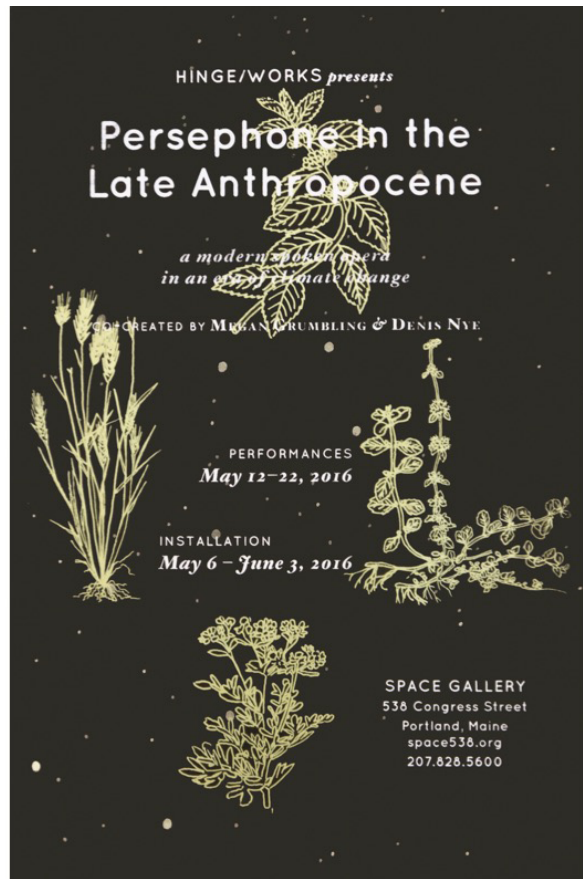
The mode of Immersion fuels the short composition *Through the Eyes of an Octopus* by allowing audiences to bathe and bask in the sensory experience of one remarkable nonhuman being. The intimacy of such visceral identification with another creature could prove to be a powerful and pleasurable incitement to cross-species empathy.

Finally, Invitation is the mode that most grounds *Snow, Millennia, and Blue*, a short composition-in-progress that is a paean to glaciers. The mode of Invitation welcomes audiences into opportunities to think, feel, grieve, imagine, and be changed—all crucial acts for practice and praxis in our environmental moment.

Collectively, these three compositions present a range of ways that words and music together might re-engage our relationships with the natural world, heighten our stakes and agency in responding to environmental crisis, and renew our capacity to feel joy, empathy, and connection with our fellow beings and forms.

Initiation: *Persephone in the Late Anthropocene*. (Co-created with composer Denis Nye; produced in Portland, Maine, 2016). Listen to a recording of [the opera's instrumental score](#). For references to the author's text: See Grumbling (2020).

ESSAYS — CONTINUED



(Poster Design and Photo: Jenna Crowder)

When our seasons turn strange and erratic, what happens to our stories? To our heroes? What happens to Persephone, and to the deal she once struck between our world and the Underworld—the very deal that, in one story, gave us the seasons?

This is the question that spurred the birth of *Persephone in the Late Anthropocene*, an experimental opera that I co-created as librettist with the late composer Denis Nye. I'd met Nye some ten years before in the scrappy arts scene of Portland. He often spoke of his music in the idiom of landscapes, and he had a particular devotion to presenting both the beauty and the brokenness of our world. Nye and I collaborated as the production company Hinge/Works on several compositions before we began *Persephone*, our first explicitly environmental opera and our final work together before his death in 2016.

We conceived *Persephone* as a sequel to the classical myth, and we intended its near-future ecological and psychological dystopia to be recognizably unsettling to our audiences, with its floods and fires, guilt and grief. In the original myth, when Persephone is abducted to the Underworld by Hades, her mother, Demeter, halts all the fruiting of the earth as she searches for her daughter. Eventually, a deal is struck: Persephone will hereafter spend three months of each year underground (one for every pomegranate seed she has swallowed in the Underworld). The myth explains the phenomena of the seasons and of ecological limits.

In our opera—essentially a modern sequel to the classical story—we find the goddess coming and going erratically, and unseasonably, between our world and the Underworld. She drinks too much, eats too many exotic fruits, takes a hu-

ESSAYS — CONTINUED

man lover, and engages in other unsettling and manic decadences. Her unpredictable behaviors are a metaphor for the extreme disruptions of climate change, and her justifications for them mirror humans' own naïve, dangerous, and environmentally oblivious actions.

As it did in ancient times, then, the Persephone story serves in our opera both as a lens for the seasons and as a proxy for our own human impulses and limits. And as in ancient times, the Persephone story of our opera also constitutes a certain kind of mystery: For generations, ancient Greeks enacted the Persephone myth as part of The Eleusinian Mysteries. These initiates, or *mystai*, took part in the Mysteries by going into a literal and figurative darkness, seeing a light, and coming back out transformed and renewed—having found both literal and figurative illumination.

These Mysteries became the foundation of our opera, which was, in this classical sense, a Mystery as well. Our aim was to make *mystai*, or initiates, of the audience themselves—to take them on a journey into the darkness of what we know and fear of our environmental crisis, then lead them back out the other side into the light, to find themselves having changed during our journey together.

The libretto of *Persephone* encompasses a range of styles, moods, and attitudes toward the natural world and environmental crisis. As with ancient Greek gods, our characters represent projections of human qualities, whether weaknesses or strengths; we intended for the audience to recognize their own environmental attitudes and behaviors through intimacy with these characters, their words, and their musical refrains.

Persephone's operatic voice is sensual and lyrical. She is at first blithely unapologetic about her unseasonable desires, embodying our own human resistance to the limits of the seasons and the earth:

Living in the dark takes will. Irony.
A strong stomach for dearth, dearth, dried fruit.
And no harm, time to time, to sing too much
in the sun, exotic plums, fresh blistered lemon
on the lips.

Later, she laments the damage that her choices have enacted around her, the “leaking seas, the thirst. / The heat-rash,” “this ever-warming bed,” and “the sweetest things / gone missing. Songbirds. Fisheries and favorite trees.”

Demeter, framed as the main storyteller of the opera, engages directly with the audience to help us understand “what happened” to Persephone and the world. She begins by telling us a version of the original myth:

What happened was, she was pulling.
Long ago. Pulling at something. A flower?

Yes, maybe. Narcissus, it might have been.
And when its root gave way, what happened was

her going below, cold
and swallow.

Everyone knows
that part.

ESSAYS — CONTINUED

She then begins to recount, metaphorically, the environmental perversions that have occurred since then:

What happened was, much later, a different kind of pulling.
A string for a bell, sweets from a bowl, sheets

from a bed. This pulling was much easier
than with that tough root. And she went on and on,

dingdingding, syrup, and silk
all day long. A taste for more

than mysteries.

Demeter becomes fiercer and more fragmented, and as the goddess of earth and harvest, her storytelling nods to industrial agriculture's chemicals and monocultures: "What happened was antibiotics. Later. Neonicotinoids / and corncorn. My atrazine fog."

Meanwhile, a chorus of Everyperson human "We's" enables and is seduced by Persephone, caught up in her indulgence and her spiraling dissolution. These hapless, playful We's, good-intentioned but fuzzy on the big picture, speak with some levity running through their colloquial, sometimes absurdist prose poems. In their opening appearance, the We's recount their sanguine, exceptionalist early reaction to Persephone's unseasonal appearances:

At first, it was all biergartens and orange Dreamsicles. She wasn't supposed to be around now – these were her months to be away with him, eating stones and stroking clocks. Or whatever she did with him. But she had chosen *us*.... We made merry, made noise, made hay, made out like magpies. Then she was gone again. She left us, each time, with our suddenly bared skin and our chosenness, with our schoolchild sensation of having gotten away with something slight but delicious.

But the We's too soon grow queasy at what they see, and they are reduced to reciting a litany of horrors: "Fire ants. Wildfire. Food riots. / Heat stroke. Too many ticks. Green crabs. Rotting ice. / Lymphoma. Sticks and stones. Drowning, thirsting. Dead zones." Later, in their grief and guilt at what humans have wrought, the We's disavow all human creations—gods, story, and even language itself. But ultimately, a trip underground, a dose of humor, and a reemergence into wonder bring them back to agency and hope.

And how does climate crisis translate musically, in this modern myth? Composer Nye wrote with an ear to entice, disorient, dismantle, and, ultimately, offer solace, beauty, and hope. He scored *Persephone* for quartet—violin, viola, cello, and oboe—in post-Romantic style, rich in contrapuntal complexity, dissonance, and fragmentation. For a story so dramatic and yet so close to our everyday lives, Nye chose the intimacy of a chamber ensemble coupled with the grand musical influences of Wagner, with his complex textures, leitmotifs, and epic chords, and the broken, punctuated landscapes of Elliot Carter.

Demeter's accompaniment begins in slow, tender, mournful concern, rich in braided laments on the strings, while Persephone is drawn in soaring violin motifs, and the We's—the characters perhaps most like most of us in all our human curiosity and clumsiness—are voiced with playful, careening, accelerating pizzicato, skittery vibrato, and trills on the oboe. In performance, the music of *Persephone* was filtered live through a digital delay; the aural effect mirrored the disjunction and crisis—as well as the beauty—of our modern natural world. This delay sent reverberations of the music and words echoing beyond their initial sounding, simulating the inexorable ripple effects of our own words and actions on our environment.

ESSAYS — CONTINUED

As the story enters the deepest darkness of the third movement, the musical motifs break down, becoming more disjointed and dissonant, representing both the humans' emotional turmoil and the chaotic destruction of the landscape around them. But once the We's recognize that they cannot stay in the dark of their passive grief and guilt, that they must live and act in the world, and that they must find ways to tell and act upon "what happened," the music restores its original motifs and harmonies, which nevertheless remain tinged with dissonance.

The purpose of the classical Greek mysteries, which brought initiates into the dark and back to the light, was to reconnect them with their senses, their ancestors, and their capacity for wonder. Our purpose was similar in creating *Persephone*.

As they return into the light, the We's find themselves newly astounded by every detail of the life around them. They gather around a sleeping Persephone and are "amazed at things we had never noticed"—the thrum of her pulse, the faintest sound of her breath. And they find new wonder in their understanding that she is alive:

Alive. We spoke the word over and over. The life of her rose in our chests, caught and rung in our throats.

The opera leaves us with a call to find attention and reverence for even the smallest facets of life around us, as a place to start to both heal and act.

Immersion: *Through the Eyes of an Octopus*. (A collaboration with composer Marianna Filippi for KIMI Ensemble; performed in Copenhagen, Denmark, and Camden, Maine, 2022. Watch a [video](#) of the Copenhagen performance. The author's libretto can be found at Filippi ("Compositions").

While the complex narrative of *Persephone* was written to initiate audiences into a ritual experience of climate crisis, the short composition *Through the Eyes of an Octopus* was meant to immerse them in the bodily and sensory experience of one impossibly wondrous creature—and so to inspire curiosity, awe, and fellow-feeling.

I first met my *Octopus* collaborator, composer Marianna Filippi, in 2019 in Portland, Maine, after a performance in which I collaborated with the cellist Eugene Friesen, reciting poetry by Rumi and my own poems as he performed with several Portland musicians. Filippi, originally from Midcoast Maine but now based in Copenhagen, has composed often on environmental themes. Some of her works include *Jordens Sjæl*, a composition for symphony orchestra that Filippi calls "a versatile celebration of the majesty of the Earth"; *The Trees Speak Without Words*, which "sonically illustrates the biological science of tree systems, and how they communicate through their roots"; and *Abyssal Beings*, a chamber work for accordion trio that celebrates bioluminescent creatures called the Sea Angel, a species of translucent sea slug, and the Tomopteris, a type of segmented sea worm (Filippi, "Compositions").

Not long after the Friesen performance, Filippi reached out to me to propose a collaboration on a choral commission honoring Maine's natural land- and seascapes for the state's 2020 bicentennial celebration. (The performance was delayed for three years by COVID, but finally premiered in December of 2023). Our next collaboration, *Through the Eyes of an Octopus*, was inspired by Pippa Ehrlich and James Reed's popular film *My Octopus Teacher* and philosopher Peter Godfrey-Smith's book *Other Minds: The Octopus, the Sea, and the Deep Origins of Consciousness*. We created our composition as a commission for KIMI, an Icelandic-Greek trio also based in Copenhagen.

My intention for the libretto was to immerse listeners in the uncommonly other neurological, biological, and sensory experience of moving through and sensing the world as an octopus over the course of a day. Through this immersion into the cephalopod's sensitivity and playfulness, I hoped to make familiar her strangeness, and so to inspire wonder, empathy, and intimate affection for this being—and so too, perhaps, for the lives and health of her kelp forest habitat, her neighbors, and the larger ecosystems of which she is a part.

Filippi scored *Through the Eyes of an Octopus* for mezzo-soprano, accordion, and percussion (including vibraphone and

ESSAYS — CONTINUED

marimba). In her composer's statement, she writes that the composition "focuses on the octopus's extraordinary sensory abilities, its shape shifting and color-changing abilities, the eight semi-autonomous tentacles, and its capacity to be sensitive and to express emotion" (Filippi, "Compositions").

Filippi's musical approach was playful and complex—as rich, by design, as a vibrant ocean ecology—and placed unique challenges on the vocalist and musicians, all three of whom were asked to wield percussion instruments (an ocean drum, bags of marbles, Tibetan cymbals, castanets, Chinese opera gongs, and stones) as well as to vocalize in whispers, sibilance, pops, and sudden intakes of breath. Filippi writes that she chose to score this elaborate auxiliary percussion "in order to satisfy the virtuosity that the libretto, and the octopus, required" (Filippi, "Compositions"). The score begins slowly and rhythmically, in an extended seascape sequence of slow ocean drum, marble bags, and cymbals unaccompanied by vocals, bringing listeners down to the ocean floor.

I had my own fascinating challenge as the librettist: how to lyrically simulate the experience of a creature that has semi-autonomous arms, that can shift color and texture as it moves across different features of the sea floor, and that can essentially see and even taste with its suckers? In drafting the libretto, I drew on synesthesia, onomatopoeia, rich imagery, and cephalopod-esque neologisms, in playfully expressionistic constructions meant to bridge humans' sensory knowns with the marvelous unknown.

The libretto begins with the octopus waking and uncurling her tentacles from her cave, as the vocalist slides across the entirety of her vocal range, under the musical direction "noticeably out of time/lagging—almost yawning, as if just waking up":

Unspool Uncoil Unwind
From the dream sea
From the shell room

Sense the sea
Writhe-mind reach sucker-kiss clutch finger-lip lick

moon-tongue to moon-tongue to moon-tongue to moon-tongue....
(Grumbling, *Through the Eyes of an Octopus*)

Through the lyrics, the octopus proceeds to swim and shift her way across the ocean floor, "becoming," through her incredible powers of camouflage, a variety of objects and beings—including kelp:

Slither swim swooooosh through the sea
Crawl writhe wooooosh over the kelp
Slither swim

Be the kelp!

glide green wrinkle clench stipple skin
flutter frond-arms and swaaaayyyy.
(Grumbling, *Through the Eyes of an Octopus*)

After a series of such protean adventures (including some playtime, during which she wriggles her arms up into a gleaming school of fish) the octopus returns and re-coils into her shell cave. The music reprises the slower seascape rhythms from the overture, the octopus drifts off, and her "dreamskin" begins the color shifts (*"umber drift violet drift blue"*)

ESSAYS — CONTINUED

that sometimes accompany a cephalopod's sleep (Grumbling, *Through the Eyes of an Octopus*).

Filippi and I wrote *Through the Eyes of an Octopus* hoping that as listeners became immersed in the creature's day, they might feel similarly to how we ourselves felt in researching, imagining, and writing about octopuses. We hoped that their response would begin in curiosity, be moved to awe, and land in delight and affection. And we hoped that listeners might be moved to immerse themselves so intimately in the lives of our other fellow beings as well. This sense of bodily immersion in a nonhuman being, we believe, could be a powerful practice in our environmental moment, as biospheric health hinges upon decentering human primacy and growing our sense of community and solidarity with other beings. This decentering might best begin not with the intellectual brain, but with our most primal senses and wonder.

Invitation: “Snow, Millennia, and Blue.” (A work-in-progress collaboration with composer Marianna Filippi, to be performed by choir and cello octet in Copenhagen, summer of 2024.

The melting of Arctic glaciers is among the most visceral and epic tragedies of our environmental crisis, and yet it often feels difficult to grasp at full scale. When Filippi reached out to me about a collaborating on a piece about glaciers, I knew I wanted the libretto to invite listeners into closer proximity and intimacy with a glacier, and into opportunities to feel, mourn, and even be changed by a glacier's essence.

To do so, my first decision was to make glaciers an animate entity and to let them voice the libretto in the first-person plural “we.” The question of how a collective of glaciers might vocalize, and what they might say, was an interesting one. I found it seemed right to have them speak in simple, strong, open phrases that could be held in long tones.

The glaciers' voice evolved to hold rich verbal music, including vowel assonance, which seemed resonant with their capacity to hold and vibrate with water and scree, and onomatopoetic alliteration, expressing their incredible powers for “[s]craping stone to till and trough.”

The libretto contains six short movements, followed by a coda; each movement begins with an invitation to “hear” something about glaciers, affording glaciers a storytelling and teaching role. The first movement, “Blue,” aims to at once revere and demystify their unearthly glacier blue by telling of the hue's origins: “Hear, how our blue was born,” the glaciers offer, then recount:

Snow fell. And snow fell. And snow fell.
And ice pressed close and long.
So close, so long
millennia
our crystals were transformed.

And so there was a blue
born in our ice.

Essence blue
Compass blue
Pulse blue

In the second movement, “Oracle,” the glaciers speak of the stories they hold of history:

Every season leaves a layer
of what has passed.
Snowfall and spoor, fossil and ash
Bubbles of atmosphere and breath

ESSAYS — CONTINUED

They then make clear the insights they offer of both past and future:

Know our core and learn the gone
Know our core, foretell the world

The third movement reminds us that glaciers are active and constantly moving—moving over the earth, moving mountains and sand, and even moving within themselves, as they vibrate with the objects they carry and traverse. They announce that they are “[s]ounding tones with every stone we touch.”

Because I hoped to bring listeners into a closer relationship with glaciers before confronting them with the glaciers’ crisis, I waited until the fourth and fifth movements to bring the catastrophe of melting into the glaciers’ voice. “Hear, how our blue is going,” they offer in the fifth movement. “How our blue is ghost.” And as they earlier explained the origins of their blue, they now explain the origins of their melting, repeating lines as in a dirge:

Whims and risks and reckless gases rise.
Our sphere warms.

So high, so warm, we pool, we pour, we rush.
So high, so warm, we pool, we pour, we rush.

And so there is our going. And so there is our ghost.
And so there is our going. And so there is our ghost.

The fifth movement, “Louder,” elaborates on the melting by relating the incredible fact that as glaciers melt faster, they are growing louder:

Our sound is swelling, growing swollen
melting, running, roaring, rumbling, quaking, cracking, calving, crashing

Going and ghost, we grow deafening
Going and ghost, we could rouse the gone

In the sixth movement, “You,” the glaciers present their most poignant offer of wisdom: “Hear, how we may move in you.” They describe how, with attention and reverence, our close knowing of the glaciers might change us for the good:

Allow our blue within, lucent
Learn our core, our oracle
Thrum your fibers with our force
Know us, going and ghost

And keep us, close and long.
So close, so long,
your being may transform.

And may there be a blue
...born in you of our ice.

A blue of reverence, balance, awe

ESSAYS – CONTINUED

Filippi plans to score this libretto for cello octet and *lanspil*, a traditional Icelandic drone zither. The choir will also take part in instrumentation, via nonverbal and manual vocalizations, to help conjure and animate a glacier's sibilance, cracks, pops, and fizzes.

We hope that those who listen to "Snow, Millennia, and Blue" will be moved to understand that glaciers are constantly moving, that they hold our planet's stories, and that they possess, in a very real sense, voices and even animacy. This composition will invite audiences to consider that there is much we can learn from glaciers, and even an essence we might embody, for the greater empathy and balance of all in the natural world.

Conclusion: Writing through the Anthropocene

One of the greatest challenges for anyone engaging with environmental themes in our moment is the question of how to balance the horror with the exhilarating beauties of our natural world. And it will take an intricate ecology of creators, projects, performers, tellers, and listeners to help us learn this balance and move forward toward solutions. The making and receiving of environmental opera represents one nexus of ways that we might engage, in community, with the vicissitudes of our natural world and our complex relationships within it. Works of environmental opera can initiate us into ritual journeys through environmental crisis, grief, and enlightenment. They can immerse us in experiences that incite renewed wonder and love for our fellow beings. And they can invite us to more intimately know and even be transformed by the creatures and forms of the natural world, these miraculous systems that are alive all around us.

"*Alive*," we too might marvel, just like the *Persephone* chorus, at these wondrous webs that hold and inspire us, that we depend upon for our lives. We might even, like the *Persephone* chorus, be moved to speak, sing, or hear such words over and over, as in a hymn or psalm. Both the words and their music can help bring us closer to our natural world—which is to say, closer to home.

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BOOK REVIEWS

Walters, Lisa, and Brandie R. Siegfried, eds. *Margaret Cavendish: An Interdisciplinary Perspective*. Cambridge: Cambridge University Press, 2022. xvii + 307 pp. ISBN (hardback): 978-1-108-49036-8.

By Marcus P. Adams, State University of New York at Albany

Categorizing Margaret Cavendish's thought is no easy task. Cavendish developed her philosophical system over time, but she produced a mountain of other literary works, from poems to plays and from science fiction to biography. Recognizing the breadth of Cavendish's works, editors Walters and Siegfried assembled scholars from a range of disciplines to address the following themes: history of science, philosophy, literature, politics, and new directions. Since *Margaret Cavendish* is an anthology that treats different yet interconnected parts of her thought, this review highlights only some of the many contributions that the volume makes.

The chapter "Margaret Cavendish: Natural Philosopher and Feminist" by Carolyn Merchant begins the section on history of science. Merchant situates Cavendish's forays into natural philosophy within a broader group of women contemporaries who contributed to this area. Lisa Sarasohn's chapter "Margaret Cavendish Thinks about Sex" traces how Cavendish's metaphysics provides space for anti-essentialist understanding of sex and gender and provides her with resources for thinking of these as continuous categories. As Sarasohn highlights, Cavendish's views on sex and gender range from sometimes *seeming* to parrot views sympathetic to Galenic-Aristotelian accounts but then at other times emphasizing that there is *infinite* variety in nature. Sarasohn emphasizes that identity is an ambiguous notion for Cavendish, as illustrated with the case of Lady Happy in "The Convent of Pleasure" (pp. 48-49).

In "Margaret Cavendish and the Rhetoric and Aesthetics of the Microscopic Image in Seventeenth-Century England," Stephen Clucas examines Cavendish's criticisms of Hooke's use of images. Clucas focuses on Hooke's arguments that microscopic observations revealed true natures of natural objects by claiming that the microscope corrected deficiencies in the senses following the biblical fall. Similarly, Henry Power tried to bolster the use of images by emphasizing the beauty he claimed was revealed by them. Clucas situates Cavendish's criticisms of these attempts by focusing on the unnaturalness of using the microscope—it failed to show internal motions of objects—and her claims that the instrument provides pictures of monstrosities (p. 61).

The section on philosophy opens with Jacqueline Broad and Maks Sipowicz's chapter, "Cavendish's Philosophy of the Passions," which aims to provide a systematic account of Cavendish's understanding of the passions. Taking Cavendish's version of Neo-Stoic causality as their starting point, Broad and Sipowicz convincingly argue that Cavendish's view of the passions was a genuine alternative to the Cartesian view. Rather than viewing passions as passive, Cavendish held that although external things are frequently antecedent causes for passions, they are merely the occasion for self-moving matter to act on its own. The picture of Cavendishian passions that emerges is a contrast with the Cartesian view: passions are entirely free actions (pp. 87-89) and are active rather than passive (p. 91). Not only does this chapter unearth a uniquely Cavendishian account of the passions, but it challenges a narrative told in the history of philosophy that with David Hume the passions were transformed from that which is to be suppressed to that which is a guide.

In "Cavendish's Philosophical Genres in *Philosophical and Physical Opinions* and the Question of Hierarchy," Karen Detlefsen addresses hierarchy generally, and related to gender in particular, by focusing on Cavendish's ontology of matter. Detlefsen locates a potential source for hierarchy in natural philosophy within Cavendish's account of differences among nature's parts; although all parts are composed of matter, they are differentiated from one another by their different shapes and proportion of rational matter (pp. 117-119). Nevertheless, Cavendish seems to hold that differences among the parts of nature do not necessarily imply differences in their abilities or worth. Finding this tension in Cavendish's main works, Detlefsen considers whether the prefaces of those works might shed light on Cavendish's view.

BOOK REVIEWS – CONTINUED

Part 3, on Literature, begins with Brandie R. Siegfried's chapter, "Of Webs and Wonder: The Atomic Vitalism of Margaret Cavendish's *Poems and Fancies*," which starts by noting Cavendish's own insistence that her poetry was essential for understanding her natural philosophy. Siegfried identifies fancy as a vehicle for entertaining speculative philosophical thoughts in a more pleasurable mode. Cavendish, as Siegfried shows, understands fancy as a way for women to engage in reasoning, one that resists strict rule and method but instead proceeds "by choice" (pp. 133–134), akin to the multiple routes one can take in stitching or needlework. Instead of seeing philosophy as consisting only of method in a Cartesian framework, there are many ways to approach nature.

"Margaret Cavendish's Prudence; or, Preservation and Transformation in *Playes* (1662) and *Plays, Never Before Printed* (1668)" by Lara Dodds examines how Cavendish re-used / configured material written before the Restoration in later works. Cavendish recognized that her plays would be criticized not only because she was a female author but also because they did not meet expectations, such as those regarding coordinated movements of actors (pp. 160–161). Dodds suggests that we understand Lady Prudence in *Playes* (1662) as exhibiting Aristotelian *phronesis* in rejecting various suitors and accepting a less than likely one, one whose external appearance belied his inner worth. Furthermore, Dodds sees prudence as part of Cavendish's own identification of her actions; for example, she prudently publishes her work so her ideas can be read. While some of the characterizations of prudence mentioned seem like instances of *phronesis*, it is not obvious we need to see it as behind all of them (e.g., Cavendish's description of keeping copies of her plays lest they be lost at sea like a set of them were after a shipwreck [pp. 168–169]). Sometimes Cavendishian "prudence" seems less than *phronesis* and more akin to the kind of prudence that her contemporary Hobbes identified as mere prediction of some future event based upon associations formed by past experiences.

Part 4 examines Cavendish's politics. Mihoko Suzuki traces the theme of Cavendish's experiences during the wars and her implied criticisms of Charles I in *Natures Pictures*, Hilda L. Smith treats the *Orations* and shows Cavendish's concerns about power and gender, among others, and Joanne H. Wright argues that *Sociable Letter* #16 should be understood as showing anti-royalist tendencies. The final section of the book—Part 5, on "New Directions"—looks ahead to possible futures for Cavendish studies. Liza Blake examines the seemingly disconnected parts of *Blazing World*, something Cavendish herself mused about, by looking to the collation formula for the 1666 edition (alongside *Observations*) and other printing details. These text-critical details suggest that the structure of the printed edition differed from the originally intended one. Sarah Connell looks to Cavendish's aim of "singularity" by subjecting her works to a digital analysis where Cavendish's works were compared to others by looking at features like the structures of the texts and representations of female characters.

In sum, *Margaret Cavendish* fulfills its promise of tackling Cavendish in a truly impressive and interdisciplinary way. The editors are to be commended for this volume (note: editor Siegfried passed away before the book went to press). This review has touched only on some of the contributions that the volume makes; the book will serve well to drive future discussions of Cavendish's multifaceted thought for scholars and students alike.

BOOK REVIEWS – CONTINUED

Fischer, Mia. *Terrorizing Gender: Transgender Visibility and the Surveillance Practices of the U.S. Security State*. Lincoln: University of Nebraska Press, 2019. 282 pp. ISBN (hardback): 978-1-4962-0674-9, ISBN (paperback): 978-1-4962-3053-9.

By C.L. Quinan, University of Melbourne

Mia Fischer's *Terrorizing Gender: Transgender Visibility and the Surveillance Practices of the U.S. Security State* analyzes how (some but not all) trans populations are regulated and scrutinized under the heading of state surveillance and securitization. Theoretically and methodologically, the book takes a transdisciplinary approach that combines trans and queer theory, media studies, critical race theory, and surveillance studies. Equally, it demonstrates a creative organizing framework in its use of scavenger methodology that finds valuable links between a broad range of primary sources, including news media, legal discourses, ethnography, reality television, and social media discourses.

The book is linked by three case studies, which Fischer astutely deploys to illustrate how certain gendered and racialized bodies are seen as “threats” and work to continuously construct the boundaries of “national security.” While the focus of the book is largely the United States, many of the findings can be extrapolated to other countries and regions throughout the Global North (e.g., Europe, Australia, etc.). This monograph makes an excellent contribution to a growing body of trans studies scholarship that complicates issues of visibility and challenges teleological narratives that suggest that we have somehow reached a “tipping point” that heralds in full acceptance and recognition of trans, non-binary, and gender-diverse people.

Fischer opens the book with the now-infamous *Time* magazine cover depicting a confident Laverne Cox and emblazoned with the words “The Transgender Tipping Point: America’s Next Civil Rights Frontier.” Now, ten years later, that 2014 magazine cover has, on one hand, proved quite naïve in its vision of a different world where trans folks are fully accepted in society. On the other hand, it has become emblematic in the field of transgender studies, with several scholars using it as the starting point for their own analysis and interrogation of teleological narratives that suggest we have somehow achieved equality and inclusion. Similarly, Fischer uses this example to illustrate the paradox that with increased visibility and representation of trans people in popular culture comes increased violence directed at trans populations, in particular black and brown trans women.

In the book’s introduction, entitled “A Transgender Tipping Point?”, Fischer lays out the stakes of the book’s broader argument that contrasts upticks in media representation of trans people with trans and gender diverse people’s everyday experiences, including how these media portrayals actually “(re)produce their surveillance and management” (6). The surveillance practices that Fischer refers to include policing, violence, and discrimination, amongst others. As Fischer writes, visibility actually creates a “double bind” and is connected to bio- and necropolitical regulation and management by the state (14).

Fischer offers a series of provocative questions that underpin the book’s argument and intervention: “What types of trans visibilities and identities are constituted as normative subjectivities deserving of national belonging and access to U.S. citizenship rights? Whose bodies and identities are rendered as deviant and thus undeserving and abject by media and state institutions?” (18). The book responds to these open-ended questions through three case studies that illustrate the dynamics upon which the book’s key arguments of visibility, media coverage, and state surveillance lie. Both Chapter 1 (“Pathologizing and Prosecuting a (Gender) Traitor”) and Chapter 2 (“Transpatriotism and Iterations of Empire”) are focalized around the case of former US Army intelligence analyst and whistleblower Chelsea Manning. After having been charged for leaking sensitive military documents and sentenced to thirty-five years in prison, Manning came out as transgender. Fischer’s concept of transpatriotism, which forms the core of the book’s second chapter, is an excellent intervention and a helpful supplement or corollary to Jasbir K. Puar’s articulation of both homonationalism and trans(homo)

BOOK REVIEWS – CONTINUED

nationalism. Fischer's furthering of these concepts helps us analyze who belongs and who does not, as well as who is considered a "proper" trans person and can therefore be integrated into the national imaginary.

Chapters 3 and 4 ("Blind(ing) (In)justice and the Disposability of Black Life" and "Materializing Hashtag Activism and the #FreeCeCe Campaign") home in on the story of CeCe McDonald, who was sent to prison for manslaughter after killing the man who had assaulted McDonald and her friends. Fischer combines ethnography and social media analysis to analyze how the media colludes in state surveillance and exacerbates the daily violence experienced by trans women of color. Chapter 5, entitled "Sex Work, Securitainment, and the Transgender Terrorist," turns to Monica Jones, an American sex worker activist who was deported from Australia because she was perceived as a threat to national security. The chapter examines how the Australian reality television show *Border Security* worked with customs officials at the Sydney airport to make a spectacle of Jones, effectively showing that being a trans person of color is itself perceived as a "national security threat."

The stories of these three women are, sadly, not exceptional but instead reflect how, as Fischer writes, "certain racialized others are always already criminal" (13). Taken together they also effectively highlight how media coverage is itself part and parcel of state surveillance. Fischer provides a clear rationale for why the book centers on trans women specifically. Nonetheless, it is my hope that this approach also lays the groundwork for future research on how (and to what extent) trans masculine folks and non-binary populations may (or may not) illustrate similar and different tensions between visibility, representation, and violence.

The book ends with a short coda that returns to provocations similar to those in the Introduction, asking: "How can trans lives be seen and recognized as deserving of protections with the ability to live fully but without subjection to violent state intervention processes? How do we conceive of different modes of recognition and collectivity without falling into the traps of the visual, of bio- and necropolitical systems of valuation and economic extraction?" (179) These critical questions remind us that this work – both academic and activist – is and must be ongoing. Even in the short time since *Terrorizing Gender* was published, drastic and unprecedented changes (both in the US and internationally) have occurred that seek to restrict trans people's access to healthcare, sports, the military, and education, effectively damaging the livelihood and survivability of trans and non-binary communities. By the most recent count, in the US 83 anti-trans bills have passed, with an additional 359 active bills. While 32 national anti-trans bills have also been introduced, the majority of successful bills have occurred at the state level and tend to be concentrated in right-leaning states with conservative politicians and legislators. That said, by no means should we assume this anti-trans approach will be relegated to red states, particularly with a contentious 2024 presidential election currently taking shape.

Mia Fischer's *Terrorizing Gender* makes a significant contribution to a topical and urgent issue. It takes us beyond simple progress-oriented narratives that suggest we have arrived at that mythical transgender tipping point or civil rights frontier that would have heralded in social and legal equality. This approach follows in the vein of monographs like Toby Beauchamp's *Going Stealth: Transgender Politics and U.S. Surveillance Practices* (2019), Eric Stanley's *Atmospheres of Violence* (2021), and Aren Aizura's *Mobile Subjects: Transnational Imaginaries of Gender Reassignment* (2018). Fischer's book makes a valuable addition to scholarship on (the failures of) assimilationist and rights-based LGBT political movements. It also intervenes in broader social and cultural debates about the politics of inclusion and the politics of visibility, with the chosen case studies offering a vital counterpoint to progress-oriented narratives. It promises appeal to gender and sexuality studies scholars and students working in media studies, cultural studies, critical race studies, and surveillance studies.

BOOK REVIEWS – CONTINUED

Luckett Jr., Robert E., ed. *Redefining Liberal Arts Education in the Twenty-First Century*. Jackson: University Press of Mississippi, 2021. xvii + 286 pp. ISBN (paperback): 978-1-4968-3317-4.

By Colin A. Anderson, Hiram College

John Warner has suggested that “general education is a problem of pedagogy not subject matter.”¹ If so, and if the venerable tradition of liberal education is to adapt and thrive, the challenge we face is not to come up with a slate of courses, or course options that would collectively “liberally educate” students for the 21st century, but instead to transform learning for liberal education in whatever courses might constitute a required curriculum. The traditional distributional model of general education, inherited from the 1945 Harvard report, “General Education in a Free Society,” arguably exhausted itself after a fifty-odd-year tenure, initiating the *fin-de-siècle* search for a conception of liberal education that might take us into the unknowns of the 21st century.² A contemporary consensus evolved out of the American Association of Colleges and Universities’ LEAP initiative (Liberal Education and America’s Promise), which foregrounded transferable skills—such as written communication, critical thinking, and problem-solving, among others—that are now widely seen as the essence of liberal education.³ The task that the AAC&U’s initiatives leaves for us is the adaptation of traditional “liberal arts” disciplinary courses to this new orienting purpose which will carry the justification of continuing commitment to liberal education in our era of hyper-specialization and disciplinary instrumentalization.

Redefining Liberal Arts Education in the Twenty-First Century takes up this task in a collection of seventeen essays grouped under six topical headings 1) Digital Humanities, Technology; 2) The Arts; 3) Pedagogy; 4) Writing; 5) Social Issues; 6) The African American Experience. In addition, the volume includes a preface, introduction, and conclusion. The essays were, it appears, delivered at an eponymous 2016 conference at Jackson State University, and the faculty and departments of the home institution are broadly represented in twelve of the nineteen chapters.

Before surveying the contents of these essays, it is worth indicating that they share, essentially, the consensus defense of liberal education summarized above, and that argument is made in most or all of these essays, which leads to a significant degree of repetition if the volume is read start to finish. Authors from different disciplines, of course, emphasize different skills and outcomes, but in almost all the essays, we find the same core argument that the liberal arts are especially equipped to cultivate skills that technical, vocational, and specialized curricula overlook, and which are essential for the development of good democratic citizens.

To give a sense of the wide-range of disciplinary perspectives and pedagogical innovations across the seventeen essays, I will briefly survey the core aim of each essay while highlighting the contents of several that stood out for a variety of reasons. The six topical headings that organize the volume are discussed below in pairs.

Technology and the Arts: The first two sections of this volume explore some ways in which technology and pedagogy can reorient traditional disciplinary courses, especially in the arts, and engage students in new ways. In her essay, “Digital Arts as a LEAP High-Impact Practice,” Seretha Williams shows how digital humanities methodologies can help students achieve LEAP or higher learning goals in writing courses, providing multiple examples of projects from courses and student work. Monica Flippin Wynn (“Technology in the Liberal Arts Classroom”) explains how to develop a “digital toolkit” for teaching, exploring some of the pedagogical intricacies through examples from her own toolkit. Yumi Park Huntington’s contribution, “Teaching Art History to STEM,” explores strategies to reconfigure art history pedagogy to engage STEM students in cultivating the visual and analytic skills central to art history and also to their chosen majors. The discussion includes brief reference to some of the digital platforms that might be useful in this regard. Sarah Archino significantly develops Park Huntington’s argument in her own contribution on visual literacy, “An Interdisciplinary Approach to Cultivating Visual Literacy.” Using the example of the documented benefits of visual literacy workshops for medical students, Archino’s essay develops a precise argument for the benefits of developing courses in visual literacy for general education students in addition to more traditional art history curriculum. The ability to translate the curriculum into documentable transferable

BOOK REVIEWS – CONTINUED

skills provides a powerful argument for the importance of visual literacy via art history for general education. Floyd Martin returns to Erwin Panofsky's essay on art history as a humanistic discipline to articulate the benefits of such study, alongside some confirmation of these concerns culled from recent articles in *The New York Times*.⁴ Finally, Lauren Ashlee Messina describes and explores "Dancing the Humanities" as a pedagogy for tackling contemporary social issues.

Pedagogy and Writing: The next two sections explore a variety of topics connected to revitalizing the pedagogy to meet students "where they are" and enable transformative learning. Helen Chukwuma ("Test-Oriented Pedagogy in the Teaching of Communication Skills") opens the section on pedagogy with a defense of a "test-centric" pedagogy for teaching communication skills, in which she seems to understand "test" in a much wider-range of assessments and evaluations than is customary. Kathy Root Pitts's essay, "Flexible Thought for the Test-Focused Student," plumps for a greater role for creativity in liberal arts courses in order to free students from the culture of standardized testing through creative engagement with the meaning of art objects. Lawrence Sledge argues that liberal arts courses need to be transformed through student-sensitive pedagogies (understood as culturally relevant/responsive teaching) if they are to maintain their importance ("Developing a More Student-Sensitive Approach in the Liberal Arts"). Beginning the group of essays on writing and liberal arts, Tatiana Glusko and Kathi Griffin's essay "Conversation in the Writing Center" proposes a reconceptualization of the role of the writing center as a place for dialogue and community rather than a helpdesk or a place for copy-correction. In one of the richest contributions to the volume, Eric Griffin ("Translingualism, Transhistoricism, and Shakespeare in a Freshman Seminar") describes how he transformed his Shakespeare course with a translingual pedagogy. This essay exemplifies the way in which pedagogy drives curricular evolution and the process of redefining the liberal arts through copious examples of innovative assignments that engage students "where they are" rather than bemoans the decline of an imagined liberal arts consensus. Rounding out this section, a group of four authors (Preselfannie W. McDaniels, Byron D'Andra Orey, Rico D. Chapman and Wynn) present their experience of developing a "writing boot camp" program for liberal arts faculty to facilitate and enrich their academic and scholarly work through community and mutual support.

Social Issues and the African American Experience: The last two sections of the volume broaden its scope by exploring the intersection between liberal arts education and a variety of social issues. Rashell Smith-Spears ("You Can't Say That: Warnings, Political Correctness, and Academic Freedom") examines how education is being transformed around issues of academic freedom including trigger warnings and "political correctness." In "Not All Apples Are Red," Katrina Byrd explores the ways in which power, conformity, and society structure curriculum and classroom in a provocative call for transformative, active, and collaborative pedagogies. Thomas Kersen brings a sociologist's eye to identify the ways in which liberal arts education and educators can function as a "molder of consensus" for society (Mississippi in particular) and restore a sense of common good and purpose in the public arena. The volume's editor, Robert Luckett, Jr., contributes a fascinating historical essay, "Historical Memory and the Meredith Monument at Ole Miss," concerning the creation of the Civil Rights Memorial at Mississippi University which played out as a recapitulation of the white supremacist tactic of "practical segregation"—erasing the experiences of those who fought and replacing them with a positive and optimistic message focused on the outcome. In Luckett's telling this decades-long struggle over the design, siting, and fund-raising for this memorial can reveal the importance of a liberal education in anti-racist struggles. The final chapter before the conclusion, "(Re)Engineering a New Liberal Arts Experience: Future Studies and HBCUs," is written by a trio of authors, Joseph Martin Stevenson, Dawn Bishop McLin, and Karen Wilson-Stevenson. They argue that HCBUs should develop "future studies" and "futuring methods" as a way of positioning themselves in a forward-looking evolution of the liberal arts tradition. Although there are important ideas captured in this final essay, the prevalence of an airy "consultant-speak" may frustrate the academic reader.

At its best, this book explores some of the many ways in which liberal arts education is dynamically developing and adapting to changing students, technologies, and social-political environments. It provides testimony of the efforts of faculty across many different disciplines to revitalize liberal education through inventive and ambitious pedagogical changes. The repetition of the core argument in defense of liberal education can veer towards a sermon preached for the choir, although the fact that the essays include either practical suggestions for the classroom or curriculum or reviews of relevant literature from other experts on the chosen topic will repay the choir's attention.

BOOK REVIEWS – CONTINUED

NOTES

1. John Warner, “Gen Ed Is a Problem of Pedagogy, Not Subject Matter,” accessed 13 December 2023, <https://www.insidehighered.com/blogs/just-visiting/gen-ed-problem-pedagogy-not-subject-matter>.
2. “General Education in a Free Society” (Cambridge: Harvard University Press, 1945).
3. Carol Geary Schneider, *Making Liberal Education Inclusive: The Roots and Reach of the LEAP Framework for College Learning* (Washington: AAC&U, 2021).
4. Erwin Panofsky, “The History of Art as a Humanistic Discipline,” in *The Meaning of the Humanities*, ed. Theodore Meyer Greene (Princeton: Princeton University Press, 1940), 89–118.

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BOOK REVIEWS – CONTINUED

Bruce, Emily C. *Revolutions at Home: The Origin of Modern Childhood and the German Middle Class*. Amherst: University of Massachusetts Press, 2021. 247 pp. ISBN (paperback): 978-1-62534-562-2.

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As debates regarding book bans in public libraries and schools rage in the United States, parents, teachers, librarians, politicians, and pundits would benefit from reading Emily Bruce's *Revolutions at Home: The Origin of Modern Childhood and the German Middle Class*. Bruce recovers successfully children's agency in their reading and education. The actively engaged child reader emerged from Enlightenment educational philosophies and middle-class familial practices, particularly as they were developed in German-speaking central Europe. Bruce teases out the tension between children exercising such agency and adult disciplining of knowledge and self-knowledge. This same tension is playing out in contemporary book-banning arguments, and understanding its roots as laid out so carefully in *Revolutions at Home* is helpful for contextualizing the stakes to grownups.

Bruce maps the creation of new male and female child readers in the seventeenth through nineteenth centuries. In doing so, she buttresses scholarly claims of the importance, and even centrality, of the German cultural matrix for northern transatlantic notions of modern childhood. This well-researched book, then, complements and expands upon such tomes in the history and study of German childhood as her doctoral advisor, Mary Jo Maynes's, *Schooling for the People: Comparative Local Studies of Schooling History in France and Germany, 1750–1850* (New York: Holmes & Meier, 1985) and *Taking the Hard Road: Life Course in French and German Workers' Autobiographies in the Era of Industrialization* (Chapel Hill: University of North Carolina Press, 2005), as well as Ann Taylor Allen's *The Transatlantic Kindergarten: Education and Women's Movements in Germany and the United States* (Oxford: Oxford University Press, 2017) and Patricia Anne Simpson's *The Play World: Toys, Texts, and the Transatlantic German Childhood* (University Park: The Pennsylvania State University Press, 2020). Her argument is transcendental: "I argue that the active child reader who emerged at this time was not simply a consequence of expanding literacy but was, in fact, a key participant in defining modern life" (3). She certainly demonstrates that children practiced increasing self-exploration and, therefore, increasingly shaped their own education over the course of the age of revolutions. Recovering children's agency is notoriously difficult, as traditional archives and methodologies have failed to capture or acknowledge such child-led activities. Her contribution, then, to recovering children's own experiences and practices is monumental, as she expands the history of reading and, really, media literacy.

Revolutions at Home includes five chapters—each tackling a different literary genre—and a helpful introduction and succinct conclusion. Chapter One, "Reading Serially: The New Enlightenment Youth Periodical for the New Youth Subject," examines sixty serial publications for children published between 1756 and 1855. These publications represented new commercial work and literary laboratories as they sought to entice middle-class girls and boys to approach willingly their Enlightenment education. Pedagogical debates shone through these periodicals, and while they were predominantly prescriptive, they allowed and even encouraged interactive and emotional reading practices. Didactic and familial reading was modeled, yet by the nineteenth century, imaginative and intimate reading emerged. As such, this genre's audience was almost obsessively considered; the child was flawed and needed guidance—sympathetic and sentimental guidance, to be sure—to achieve proper relationships and future successes. Bruce explained "the pedagogic double ideal" captured in this great outpouring of children's literature, especially, perhaps, as it applied to girls: "The reimagination of childhood as a separate stage of life and concern for the child's individual spirit produced contradictions: that youth should be cultivated to be natural and instructed to be self-controlled" (51).

The second chapter, "Telling Tales: Folklore Transformed for Middle-Class Child Readers," focuses on fairy tales, primarily the evolution of themes and practices in the Brother Grimms' seventeen editions published between 1812 and 1857. Much has been written on fairy tales, and Bruce approaches the Grimms' work, as well as other collections by their predecessors and contemporaries, as revelatory of social hierarchies and instructive of familial relationships. As fairy tales evolved

BOOK REVIEWS — CONTINUED

as pedagogy and entertainment, the child reader was taught a great deal about the emotional lives of families, including parental love, filial obedience, romantic marriage, and gender roles. She also posits possible transgressive ideas in children's reading practices around fairy tales, since they also taught story-telling. While Bruce paid attention to the real and stylized authors of the youth periodicals in the first chapter, she glossed over the biographies of Jacob Grimm and Wilhelm Grimm, as well as Achim von Arnim, Clemens Brentano, and Hans Christian Andersen. As the men began to depict companionate marriage, the importance of reproduction, and gendered household tasks—among other aspects defining the middle-class family, what insights might their own family lives (or Jacob Grimm's lifelong bachelorhood) invite?

Chapter Three, "Reading the World: German Children's Place in Geographic Education," turns from domestic fictions to geography texts and atlases. With an analysis of late-eighteenth- through mid-nineteenth-century schoolbooks, Bruce cements her argument that around 1800 active learning surpassed rote memorization as the modern pedagogical approach. She provides helpful tables to summarize changes in European geographic epistemology and in geographic textbooks (87, 89). She examines the content of geography texts, world history narratives, atlases, and natural science and draws important conclusions. The content, unsurprisingly, was Eurocentric and imperialist, but also, surprisingly, incorporated current events: children's media addressed current and ongoing political changes that were vast in this time period. Her key accomplishment in this chapter is again in the realm of children's reading practices. The practices encouraged for both male and female child and youth readers were about thinking critically and independently, and using visual learning for fun. Bruce includes a particularly riveting sub-section, "Altering Texts," that delves into how the children actually used their schoolbooks, writing and drawing in their books to practice place names and handwriting, to follow their teachers' and parents' instruction, and to be, possibly, both bored and to entertain themselves (107–113).

Chapters Four and Five pivot to writing by children. The fourth chapter, "Writing Home: Letters as a Social Practice," provides conclusions from hundreds of letters written by children deposited in eight different archives or previously published sources. Children's letter writing escalated between 1750 and 1850, and demonstrates both children's growing importance in bourgeois families and their participation in their own construction of their subjecthood via adult conventions. By writing letters, they cultivated their own familial and social networks within class settings and social circles. Children's correspondence, in turn, was clearly encouraged—maybe even demanded—as adults viewed such letter-writing activities as teaching self-discipline, self-control, and time management. Children's letter writing, then, also exhibited the clear tension between writing as self-expression and self-fulfillment, and writing as discipline and bourgeois training. Most clearly, children's correspondence embedded them in sentimental and social networks that were viewed by adults as essential to their middle-class development.

The final main chapter, "Writing the Self: Growing Up with Diaries," unpacks six diaries kept by boys and girls between the ages of 10 and 20 and born between 1815 and 1830 in various German regions. With only six diaries and none from younger children, extrapolations are necessarily more cautious. Nevertheless, these are archival gems, and they do collectively demonstrate both the increasing popularity of diary-keeping for children and youth—a kind of secularized introspection—and the tension between writing for self-formation and for self-surveillance that was heightened for child and youth diarists. While these young authors expressed limited purposes for their diaries, e.g., to record personal and day-to-day events or to encourage personal development, they clearly showed that the "individual intellectual and moral development of these children and youth was seen as a critical project for their families" (154). The diarists discussed the practice itself as one of industry and diligence—critical bourgeois values—and experimentation and expression.

As Bruce articulates in her conclusion, it is common to hear in the twenty-first century that the best thing a new parent can do is read to their young child. This received wisdom was cemented in the age of revolutions in Germany as children's education with its dueling trends to discipline and liberate was spread by the bourgeoisie. We simply cannot agree on *what* should be read by those same parents.

PREVIOUS ISSUES

- [Vol. 1, No. 1, Summer 2012](#)
- [Vol. 2, No. 1, Winter 2013](#)
- [Vol. 2, No. 2, Summer 2013](#)
- [Vol. 3, No. 1, Winter 2014](#)
- [Vol. 3, No. 2, Summer 2014](#)
- [Vol. 4, No. 1, Winter 2015](#)
- [Vol. 4, No. 2, Summer 2015](#)
- [Vol. 5, No. 1, Winter 2016](#)
- [Vol. 5, No. 2, Summer 2016](#)
- [Vol. 6, No. 1, Winter 2017](#)
- [Vol. 6, No. 2, Summer 2017](#)
- [Vol. 7, No. 1, Winter 2018](#)
- [Vol. 7, No. 2, Summer 2018](#)
- [Vol. 8, No. 1, Winter 2019](#)
- [Vol. 8, No. 2, Summer 2019](#)
- [Vol. 9, No. 1, Winter 2020](#)
- [Vol. 9, No. 2, Summer 2020](#)
- [Vol. 10, No. 1, Winter 2021](#)
- [Vol. 10, No. 2, Summer 2021](#)
- [Vol. 11, No.1, Winter 2022](#)
- [Vol. 11, No. 2, Summer 2022](#)
- [Vol. 12, No. 1, Summer 2023](#)

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