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Radiation Songs and Transpacific Resonances of US Imperial Transits

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The global impact of a novel strain of coronavirus is continually being assessed and addressed across varied disciplinary, governmental, nongovernmental, and corporate sectors. This article is interested in how nuclear power is being promoted and resisted in the midst of the global pandemic. Personal stories of the proximity and regularity of sickness and death haunt the Marshallese diaspora with an intensifying speed and reach, recalling both the emergence of radiogenic diseases in some atoll communities, the clusters of deaths prefigured by these diseases, and the shift to Americanized lifestyles in the midst and aftermath of US nuclear testing carried out between 1946 and 1958 in the Marshall Islands.[1] On the one hand, nuclear corporate and governmental entities have positioned nuclear power as part of a postpandemic resiliency; on the other hand, Marshallese communities in the US, with underlying conditions due to US nuclear imperialism (cancer, diabetes), are shut out of official conversations. This article shows how radiation songs are vital ways that Marshallese singers, particularly women, have challenged boundaries of official nuclear business that have ignored them and subjugated their lives in the service of nuclear futurity.

US nuclear imperialism has forged globalism through crisis-making as profit-making in ways that normalize profit while making crisis and war exceptional, which in turn makes suffering seemingly exceptional. US nuclear warfare, as practiced on Marshallese communities, is no exception. As Rebecca M. Herzig writes, "Battles over whose suffering gets to matter have been waged, in large part, over who is authorized to speak about natural facts."[2] Imperial and Indigenous space–times contest any "natural" arrangement of facts, leaving the US to adjudicate Marshallese communication through hegemonic structures that shape what can and cannot be listened to and heard. The genealogy of Marshallese colonial communication provides insight into

mistaken hearing practices. Radiation songs, for example, formally resound their colonial and missionary genealogies in musical form, yet lyrics, concepts, and ideological values yield insight into compositional techniques that offer embodied perspectives on matters often addressed through political representation. Marshallese songs not only point to historical violences that persist from imperial transits which efface singers' voices and immobilize them, but also prompt voice and mobility.

In the aftermath of World War II, the US chose nuclear proliferation to maintain the wartime economy at the expense of global health. The Marshall Islands became a nuclear colony; the US controlled the movements of bodies and information through tightly controlled mediations and governmental censorship. The US administered the Marshall Islands as part of the United Nations's Trust Territory of the Pacific Islands from 1947 to 1986, at which point both nations signed the Compact of Free Association. This international agreement signaled the end of nuclear colonialism since it granted sovereignty to the Republic of the Marshall Islands (RMI). The Compact of Free Association has a Section 177 that defines just four atolls as "nuclear affected," establishes a Nuclear Claims Tribunal, and designates monetary compensation or the "full and final payment" for all nuclear damages in the "past, present, and future." There was a stipulation that the RMI could submit something called a Changed Circumstances Petition to the US Congress to prove that circumstances surrounding the knowledge of the radiation's damage had changed sufficiently as to require additional remuneration. The RMI, after learning of the declassified human radiation experimentation documents (1994), built its case and submitted a Changed Circumstances Petition.[3] It was officially dismissed under the Bush administration in 2004, and four years later I arrived in the Marshall Islands, just as the Nuclear Claims Tribunal had reached its financial limit without support from the US.

This article unfolds in five subsequent sections to address how musical performance, which I theorize through the concept of "transnational resonances," amplify nuclear consequences across the juridical, political, and spatiotemporal divides that have impeded Marshallese communities from securing redress. First, I provide an overview of radiation songs.[4] Second, I listen to a ri-Roñļap (Rongelapese) women's performance at Nuclear Remembrance Day. Third, I theorize the importance of transnational resonance. Fourth, I listen to a ri-Pikinni (Bikinian) song called "Radiation." And, finally, I offer a conclusion that returns to transnational solidarities in forging intercultural networks for hearing. My ethnographic work on radiation songs compelled me to help start up an intercultural nonprofit, the Marshallese Educational Initiative, comprised of Marshallese and non-Marshallese persons who, today, are working to mitigate the Covid-19 crisis in Arkansas while upholding the power of cultural programming. I chose the two case study songs because they were sung and/or composed by Marshallese women in communities upheld by the US as "nuclear affected" albeit their voices are rejected from official (political, mass media, courts, biomedical) spaces; the Pikinni and Roñļap communities have been subject to displacement and, away from their home atolls, they have learned how to instrumentalize their voices in ways that can resonate

with US citizens. The singers' attention to embodied voices (when their bodies have been irradiated) helped me realize that I was listening not to listen but to hear, within resonances, our global (dis)connections, and I was compelled to share these songs across different forms—both academic and community-based.

My main argument is that exploring the work of Marshallese radiation songs and shifting from a sound- to resonance-based analytic—or shifting from a pitch-based, individual, and modern account of nuclear colonialism (including the juridical and scientific ways in which nuclear colonialism is dealt with) to a more interconnected modality of *thinking* nuclear colonialism—in transnational capacity can reanimate conversations around the embodied, generational impacts of radiological injury, including during the Covid-19 pandemic. The concept of transnational resonances takes a sound-based and vibrational approach to radiological movements and how these movements are shared and blocked. Resonance puts pressure on the logic of sound as something abstracted or discrete, like a pitch, that is disconnected from material ramifications. Ethnomusicological concerns around decolonization align with sound studies's ecomusicological concerns with environmental injustice, racism, and the materiality of sound. Transnational resonances of US imperial transits share the sonic imprints of nuclear coloniality embodied by Marshallese who have been subjected to massively destructive weapons, biomedical studies, patriarchal governance, and historical amnesia. As a concept, transnational resonances of US imperial transits share how violent movements of nuclear colonialism are embodied and performed in song assemblages that cross scales and imaginaries of time and space, such as the global and the national (here, specifically the US and RMI), the perceptual and the imperceptible in ways that can help us evince connections to the contemporary interstices of power. Resonances, as I describe further, are embodied and shared in layered community formations, and they connect the individual with the environment and different communities in ways that amplify the entangled historical, generational, social, environmental (nonhuman), and political pressures on the subject. For example, racialized Covid-19 vulnerabilities can be shown to be related to nuclear colonialism through the preexisting conditions and health issues that musical performances bring up and locate as matters of extant radiological injury and damages.

Song assemblages speak to the concept of what I call "more-than-human temporalities." We are comprised of the transits of many nonhuman entities—from radiation, viruses and bacteria, foodstuffs, medicines, air, and our means of exercising our bodies (including voices). According to Dorceta Taylor, "toxic communities" are systemically formed by transits of the capitalist, imperial excesses that are actually central to corporate functionality.[5] Environmental racism shapes the very bodies of persons subject to a host of hazardous living and working conditions, some of which have been brought to light by Covid-19. In the arguments over the "economy" versus "health," the economy works on modern or human time while Covid-19 works on viral time. Radiation works on radiation time, differently for the different isotopic half-lives

that can last anywhere from milliseconds to millennia, but the sustained injuries are not accounted for when limited by modern legal and biomedical time. Resonance, or vibrational spacings, amplifies that change must be shared, interculturally and transnationally when dealing with global issues.

"Radiation"

"Radiation" was composed in 1985 by a ri-Pikinni singing group in preparation for the realization of the UN plebiscite that determined the US–Marshall Islands "free association" relationship through the Compact, which the ri-Pikinni and ri-Roñļap voted against, since they did not want the RMI as intermediary. While staying with a ri-Pikinni family on Ejit Island, I learned about this song, which was recorded with a male lead for radio airplay, from one of the composers, Valentina.[6] She stressed that the song laments ri-Pikinni displacement and has been used in the diaspora (e.g., Hawaiʻi) to connect with US Americans during commemorative events, such as Bikini Day, which marks the initial removal of Marshallese in 1946. The chart below offers a formal analysis of resonance through a pivotal question that spaces the verses and choruses, creating an internal call for a response and call-and-response (*see Figure 1*). The three sections musically share a line, such as section one's V1, which is shared by section two's V1 that in turn is shared with V3, and C3, in prime form, with the third section. The slight musical modification comes from the material introduction of radiation, marked lyrically, into the contemplative musical milieu.

	Lyrics **1.**	**2.**	**3.**	**4.**	**5.**	**Formal Design**
Section 1	*O, ibūromōj kōn aelōñ eo aō* Oh/woe I am devastated about my atoll	*ijo iaar drik im ruttolok wōt ie* The place where I was young and I grew up	*ta menin naaj kaaenōṃṃan būruo?* What things will make my throat (heart) peaceful?	*Jen aō ļoṃņak kake* So I can stop thinking about it	*aelōñ eo aō ej aō home sweet home* My atoll is my home sweet home	1. Verse 1 (V1) 2. V2 3. Q 4. C1 5. C2
Section 2	*O, ibūromōj kōn aelōñ eo aō* Oh/woe, I am devastated about my atoll	*ijo eļap radiation ej waļok ie* So much radiation has appeared	*ta menin naaj solve problem in?* What things will solve these problems?	*kōnke ejjeļọk uno,* Because there is no cure (medicine, treatment)	*uno in joļọk radiation* cure/medicine/ treatment to get rid of radiation	1. V1 2. V3 3. Q' 4. C3 5. C4
Section 3	*O, ijojoļāār ioon aelōñ ejjab aō* Oh/woe, I am a stranger on an island that is not mine	*ijo eļap eñtaan ko rej waļọk ie* There is a great deal of suffering that is appearing	*ta menin naaj joļọk eñtaan kein?* What things will help get rid of this suffering?	*kōnke ña ij juon eo* Because I am one (person)	*ejjeļọk bōnbōnin ilo aelōñ kein* Who is without a place in these islands.	1. V4 2. V3' 3. Q" 4. C3' 5. C5

Figure 1. "Radiation" (1985), lyrics and formal structure.

Valentina sings, from the outset, that she is depressed. She is "būromōj." The word "būromōj" literally means "throat" (boro) and desensitized/deadened (moj). The

throat, as the seat of the soul, is the vital nexus where inspiration moves. Compromised breathing is a sign of sickness; it can result in death. A deadened throat is the embodiment of the world impressing upon a person in painful ways, which registers as depression and anguish when a person feels they have no agency to change it. The transformational movements of the song find resonant spacing with the questions that pivot the statement with the reason to create layered resonance. She asks what can make her throat peaceful, what can calm her mind (per "Kajjitok") so she can stop this labor of singing incessantly, which is a Marshallese trope whereby heartache and anguish cause incessant singing to reach out in the midst of loss. It is discussed along the lines of taking flight, being swept up by the currents without knowing how to navigate them. Valentina reiterates that she is būromōj in the second section, moving from her contemplation on growing up and being shaped by her atoll to it becoming estranged as radiation appears (invisibly) throughout. She asks what will solve the problems because there is "no cure" for radiation, which she said referred to the ongoing sicknesses and the fact that "radiation" seems to be the only cure for "radiation," referring to cancer treatments (and here, I think systemic resilience or closure). The final section begins with a change appearing postradiation: Valentina is "jojolaar," which refers to a baby chick without its mother. It doesn't know how or where to scratch to get food and nourishment, so it anxiously wanders, malnourished and afraid. It has no bearings and is lonely, which emphasizes the nurturing matriline that has been symbolically and literally excised, as a shift in listening to fraternal exclusivity in masculine genres of peace talks and biopolitics.

Radiation Songs (Overview)

Radiation songs, with respect to the audiences, are shared within Marshallese atoll communities in community gatherings; for instance, when guests from other atoll communities visit nuclear-affected Marshallese communities. RMI citizens (Marshallese) perform these songs for the RMI government during formal events, such as Nuclear Remembrance Day, which is when US citizens and diplomats, expats, and citizens of other countries can learn about nuclear issues and hear some of these songs. I observed that radiation songs can also be performed for US citizens if they show an interest or when, as is the case with the first song I analyze, Marshallese communities realize that a new song is needed to address extant issues that cannot be shared otherwise or might take too much time to go through official channels (e.g., filing an official petition). There is special attention given to amplifying these issues for US governmental representatives and sharing them with US citizens, I think, because the US has benefitted from the damages done to Marshallese, which includes the pain of not recognizing their labor and investments in the production of nuclear knowledge. Most of the songs that I heard were not recorded and rather were shared within the singers' community at the various gatherings and learned through practices. Only a handful of radiation songs have been recorded for radio play.[7]

My musical analyses point to sonic evidence of US imperial transits by tracing material movements through keywords and concepts. A sonic attack, or percussion, can be heard; the resonance or decay evinces the trace (becoming) embodied in voiced "more-than-human" movements. I focus on the material impress of radioactivity on bodies as the underlying condition for the ways in which the songs resonate. Radiation provides the material foundation for these songs that compels singers' voiced accumulations of the imperial detritus that fragments Indigenous lifeways. Singers mark the presence of radiation lyrically and affectively with vocalized moments of decay, as an emptying out of sound. The songs demand an attention to the failures of imperial culture and the neocolonial agreements that sustain inequities. For example, by recontextualizing official petitions to the US government that have been dismissed, such as the Changed Circumstances Petition, on the basis of Western space–time understandings reified in modern legal, and political systems, Marshallese systems create resonant spaces that refute the time limits (statutes of limitation) placed on them, in order to make sense, in the literal and metaphorical meanings, of radiation's insensible pressures on their lifeways.

Marshallese performance and musical learning practices evince the communality of the Indigenous culture. This makes the construct "resonance" of importance since it extends and expands the individualized political voice to include more-than-human movements as multiple temporalities with which humans must contend, compelling us to think about US imperial transits for three reasons. First, modern systems are positive and attuned to presence; listeners are entrained teleologically, and future-directedness is aimed at systemic resilience or closure. Musical harmony is a sound-based abstraction of such ideological organization—notes and rests are the focus rather than the palpable resonance, conventionally. Second, resonance can challenge modern divisions of space–time. Modern event-based history can be thought of as the attack-based percussion that figures a sounded note or voice. Resonance, or acoustical resonance, while often mistaken for silence, is the spacing between attack and the insensible. It is the acoustical trace that can, when compositionally amplified, be heard in terms of a connective foundation for a response, continuation of a melodic line, or cadential closure. It can also be the heard materiality of an interrupted melodic line, vocal movement, and harmonic fullness. Radiation is perceived through the figure of decay, including temporal delay, which can be thought of as transformation. Voice-based decay can be approached through the lens of intersubjective potentiality in terms of imperial accumulations. By appreciating the labor of singers, audiences can learn how to listen, affirmatively, to resonance within themselves (ourselves), as part of the more-than-human transits of empire. Third, resonance is connected to reason. As Veit Erlmann has studied, the etymological cognates "reason" and "resonance" were, prior to Cartesianism and the Enlightenment, connected.[8] Beyond the figure of sound, as percussive attack, resonance moves as "intermaterial vibrations" whereby the intermaterial context shapes the sound quality or timbre, providing reasons for the latter's literal existence.[9]

Radiation songs' throat-based resonance challenges modern classifications of "person" and "property" that have framed remedial claims in the Marshall Islands. Singers' embodied processes of radiation absorption (injury to persons) and forced relocations (damages to property) are intimately related per Marshallese experiences, which reflect broader Indigenous political values. The voice is often theorized in terms of representation or imitation. In "Language and Nature in Sound Alignment," Janis B. Nuckolls writes of a language-based "sonically driven disposition" through which people are "aligned" with nature.[10] She explores ideophones or sound symbolism through the use of imitative sounds. Nuckolls's model of sound-based modes of imitation based on an "outside" needs to be reconsidered. Humans become aligned by listening, affirmatively and appositively, to sound qualities that resonate with(in) us based on the concomitant movements of materials. Musical communications are material transmissions that, like viral spread and contagion, create communities through their reach. Immunity, alternately, is privilege (private law, language) afforded by blocked resonance (e.g., censorship, modern demarcations). Immunity enables ignorance as protection. My case studies amplify how singers have not been immune to the global movements of radioactivity such as nuclear detonations or mediations; neither are the audience members—albeit Marshallese singers share, within the global community, how their exposure to radioactivity bears life-altering consequences and daily reminders of these consequences to which audience members might be immune. Singers' resonance, as call-and-response, sustains the potentiality for responses that divest from privileged immunity. Singers request that privatized (biomedical) language and (international) law be shared in ways that resonate with their lived experiences of radiation's changing circumstances. Songs petition to decompose US geopolitical privilege by marking ignorance (unanswered questions, here about radiation's durative impacts) as one of the underlying conditions of inequality.

Marshallese radiation songs are intercultural; they generate resonance between cultures that share the radioactivity that has been unequally distributed globally. Further, the geopolitical history of the Marshall Islands has created boundaries or time limits on how nuclear damage is perceived; the law shapes our listening by creating political questions, interculturally in which the political scale is tipped to one side of the cultural balance in various contexts by the scales of justice, which is supposed to be balanced in a non–sight centered way. Musical petitions carry the messages of official petitions in unofficial ways that can democratize political platforms. Singing has been a means whereby commoners, who learned hymns and German national melodies from American missionaries in the nineteenth century, appealed to colonial authorities working in cooperation with the chief, although the practice predates the colonial era. The musical foundations of the songs come from 1) Marshallese generational expressive practices, such as roro or incantation; 2) national anthems, Anglo-American Protestant hymns, and German, Japanese, and US folk tunes. Anglo-American Protestant missionization of the archipelago began, officially, in 1857 in the southernmost atolls. In the northern atolls, Pikinni and Ron̄ļap communities were

positioned as outliers from the colonial and missionary centers. The US opted to use these "outliers" as central in the nuclear colony after American troops had already ingratiated themselves to Marshallese through hymn singing and displays of a common culture. During this period, Americans, who refused to speak with Marshallese women about official business, maintained the elite, fraternal order of the colonial political system.

The patriarchal culture of nuclear colonialism has since become entrenched in RMI governance, which is compounded by displacements that dislodge women from their land and lineage, customary matrilineal sites of power. Nuclear colonialism uprooted communities; the exploitative system that forwards nuclear power as the future has been vehemently resisted by Pacific Islanders, with women often in the frontlines, as Mechelins Kora Iechad writes from her Palauan positionality.[11] Along with H. E. Hilda Heine, the first president of the RMI, Marshallese women have made strides in political organization and decision-making. They have also used instruments such as song to share their voices concerning ongoing injuries sustained by US nuclear imperialism. Female singers move from gender-coded voicings through multiple timbral, textural, and registral shifts. These techniques eschew the harmonic rigor espoused by modern binary culture and affirm Marshallese Indigenous cultural values of gender and human–nonhuman complementarity.

Singers' embodied voices can be read from perspectives that amplify Western, individualistic *and* humancentric values, and Oceanic, collective, and more-than-human values. Marilyn Strathern has explored how, in Melanesia, for example, the person is a "microcosm of relations," rather than a self-centered individual; a person's body is "composed of the specific historical actions of social others: what people have or have not done to or for one."[12] The perspectives are not mutually exclusive; imperial culture values the individual person in hierarchically positioned intermediary networks that drive resources directionally to elite centers from made peripheries. This is reified in representational values of modern society. Marshallese Indigenous culture, having been subject to colonial extractions and expropriation for centuries, amplifies the "opposing" viewpoint with complementary values (e.g., human–land material relationality). Radiation songs' musical movements resound both values—the representational voice marks the material relationality to which audiences are otherwise insensible.

Marshallese and English lyrics coalesce to form a new nuclear focused language whereby the lyrics resonate the new nuclear-centered embodied movements. Within the language, we can hear compositional devices, such as the figure of the question that rhetorically and literally asks—from the named to general auditor—for help understanding, for information, for advice, and for material support. These questions, as part of call-and-response mechanisms, also imply petition-style reviews. Radiation songs can be read as musical petitions because—through musical structure, rhetoric, and language—they embody the violence of Americanized imperial jurisdiction that demarcates statutes of limitation and imposes other parameters for hearings to even occur. Songs are living requests that take up the content, lyrically and formally, of

Marshallese political and legal petitions to the US concerning nuclear issues and subvert official means of censorship; as such, they are requests to review the ways that Marshallese have been and continue to be ignored, on human, cultural, and personal levels, intersubjectively.

"These are my questions for you now, still"

The RMI officially marks its complex nuclear legacy with commemorative reflection on, diplomatic engagement with, and performances of contemporary nuclear issues on March 1 of every year. The RMI's annual holiday has borne different names over the years, such as Memorial Day, Nuclear Victims' and Survivors' Remembrance Day (NVSRD), Bravo Day, and Nuclear Remembrance Day given the significance of the calendar day, March 1, which is when the US detonated its most powerful thermonuclear weapon, Castle Bravo, at Pikinni Atoll, which spread radiation throughout the archipelago. The event of remembrance moves the discourse from "survivor" and "victim" to how Marshallese remember and how public memory can serve in remediating the "nuclear legacy" through the frame of a nuclear future by focusing on how nuclear damages have yet to be equitably resolved and prevented. For now, every day brings with it persistent questions left unanswered, confusion and unrest not quelled, and medical conditions, illness, and constant trips to the hospital, and funerals that mark the realities of shortened lifespans and compromised futures. These and other acts like fulfilling US Americans' demands for ready-made poultry, are all in service to a postwar "booming" US American economy and quality of life. *Every day* is Nuclear Remembrance Day. Its memory cannot be bound, stepped away from, or forced into a single calendar day.

I attended NVSRD (2009) in Mājro, the RMI capital. The ri-Roñļap ladies' group, Iju in Eañ (North Star), performed. Iju in Eañ was initiated by the ri-Roñļap women when they were displaced to Mājro. Iju in Eañ, the name, is a metaphor for Roñļap, in the North, which guides them and orients them in the women's struggles. Away from their customary homeland, they were subject to new rules, laws, and regulations. They watched as the men went without employment, causing hardship for the entire community. The ri-Roñļap women came together to guide their community and share their struggles in political outreach. Through their political speeches and songs, they are part of international nuclear discussions and transnational activist networks. These transnational alliances challenge celebratory nuclear futures through educational endeavors around Marshallese cultural programming. Iju in Eañ's musical guidance can be epitomized by their performance of "Kajjitok in aō nan kwe kiiō" ("These are my questions for you now, still").

"Kajjitok," composed in 2008, was inspired by the political silencing of ri-Roñļap women and Utrikese women from the neighboring atoll. When US Department of Energy officials visited the RMI, they met in an official capacity with the RMI government. When the women asked to be present for the meeting, so that their concerns could be addressed, their request was declined. They realized that, in order to be heard, they

would have to compile their questions and health concerns, as well as detail the repercussions, in a way that would help the Department of Energy hear them. As Lijon, a female composer, antinuclear activist, and, in her words, "good politician" from Roñļap explained, she had a host of questions that she heard resonate with her sisters, referring to the women in her atoll community and the Utrikese community. These Marshallese communities have a long history with the Department of Energy, previously the Atomic Energy Commission. When it comes to asking questions and not being heard, ri-Roñļap and Utrikese women have been subject to race-based and gender bias in medical exanimations and ignored time and again as political persons—their "humanity" valued only insofar as they were used, as human test subjects, or human bodies to provide the raw materials for science in *human radiation experiments*.[13]

Songs, therefore, refuse being ignored and treated like "humans" solely on the basis of being subject to the male medical gaze without an appreciation of Marshallese voices—here: women's intelligence, knowledge, and sensibilities. Lijon had, like her sisters, suffered greatly from US nuclear testing, which had been with her since she was a small child. She had been irradiated by the fallout of Bravo's thermonuclear blast when she was eight years old, during a birthday picnic with her grandparents. Along with her atoll family, the ri-Roñļap, she was taken to Kuwajleen (Kwajalein) Atoll. The ri-Roñļap were put in camps and became human radiation experiments before being returned to their highly irradiated land after a few years. In the interim, without their land, the ri-Roñļap were without their means of health—their sustenance, exercise, inspiration, grounding, and so forth. American doctors isolated the ri-Roñļap from their fellow Marshallese and controlled their space–time and movements. They were fed processed foods with high sodium and sugar content, and they were given American television shows and movies; otherwise they would pace around their enclosed areas until it was time to get poked, probed, and prodded. The Roñļap community was subject to fear, stress, and isolation; women (girls at the time) were subject to compounded humiliation because of the US patriarchal culture.

US geopolitics has a cultural politics of hearing that values fraternal listening and voicing. The implications of the aural dimensions of imperial culture exceed the actualized nuclear colonial infrastructure because they are learned habits that engrain power dynamic–based sensibilities. American doctors refused to talk with the female contingent. Marshallese male relatives became intermediary translators and were fixtures at invasive examinations that advanced biomedical knowledge (for those who can pay for them)—from full-body Geiger counter readings to gynecological exams. Marshallese taboos were broken, and shame set in without generational means of coping with these new gendered violences. The US biomedical culture of ignorance around Indigenous women's lifeways and political organization through matrilineality exacerbated the economic-driven decision to detonate nuclear weapons in the first place. Nuclear colonialism became entrenched as imperial culture that refers to the ways of being, doing, and making in accumulative networks (for the global elite) that

decay bodies to retool them as laboring bodies for centralized power. Efficient listening, in imperial culture, is immunity-based; it is gendered, racialized, classed, and promotes compulsory disability through ethnocentric medical models.[14]

"Kajjitok" resonates the pain of imperialism's architecture of ignorance that was built up through questions, petitions, and appeals ignored since 1954, the year Bravo was detonated. Fifty-four years later, and during a lifetime of upheavals—numerous miscarriages, thyroid surgeries, bouts with depression and other illnesses that rendered Lijon unable to speak or sing, tight curling fingers that hindered her keyboard and guitar playing, and misinformation that compounded US ignorance of Marshallese needs—she heard her (unanswered) questions about the biomedical pressures placed on her body echo those of her sisters. She struggled to make sense of the official silence and seemingly flippant reassurances by US medical professionals who would perform check-ups and give clearances for the women to leave the hospital. Two weeks later, the women would be back, suffering another medical emergency. The cycle repeated, Lijon's older sisters began to pass away prematurely. Then her younger sisters began to succumb to their illnesses. So did Lijon. These illnesses, such as diabetes that some Marshallese believe are connected to their displacement from healthy foods and unencumbered mobility, were not radiogenic in the eyes of the US medical profession and were excluded from official nuclear consideration.

Along with the US governmental "secret classified data," the limited US capacity to hear the ri-Roñļap women's complaints, medical or otherwise, politically cordons Marshallese abilities to self-determine or adjudicate "hearings" that would set the parameters for how the US understands their nuclear plight as an ongoing reality. This reality complicates all facets of their existence and thus demands flexibility and creative remedial application; "Kajjitok" exemplifies musical strategies where women's voices, bodies, and words share a command of medical materiality; personalized movements are "sound tactics" that can be used to educate as well as liberate listeners from privatized listening and move them to connective hearing. Ri-Roñļap and Utrikese women wanted to be part of the official meeting and ask the questions plaguing them. They were denied the means of being heard, so they threw a party for the DOE during which time they sang songs. This action shows how a song can challenge the official–informal divide and pry open the modern foundations of how US imperial ignorance is predicated on centuries of various kinds of segregations, isolations, and professional adjudication-based intermediary networks that allow for such ignorance to persist. The musical performance of ri-Roñļap women constitutes intercultural outreach and highlights the durative lineaments of nuclear damage through 1) challenges to imperial culture's modern space–time boundedness, 2) inquiry-based call-and-response, and 3) marked transits as more-than-human movements constitutive of the singing voice.

"Kajjitok in aō nan kwe kiiō"	**"These are my questions for you now, still"**
Kajjitok in ao nan kwe kiiō	These are my questions for you now:
Komaron ke jiban ippa	Can you help me
bukot mejlan aban kein ao	find a way to untangle myself and my family
kab ro nuku	from these things that hinder us?
Komaron ke uwaak io?	Can you answer me?
Etke ejjelok an *takta ani*?	Why don't I have a dentist?
Deka im jibke, im arin,	A doctor for my lungs, my kidney, and
Im arji-ajin?	my liver?
Imaron ke bok melele	Can I please find meaning
bwe en emman lomnak	so that I can find peace of mind?
Ke na imaron in	Because I might go insane
udiakak kin ao jaje.	not knowing.
Ewor ke baj jemlokin ao idraak?	Will there be an end to taking pills?
Aspirin, *calcium*, uno in kirro,	Aspirin, calcium, gout medicine,
Ewi waween am lomnak	What is your opinion
problem in aō	of my problems?
Bwe etakie na jab kiki	Because there are times I can't sleep
lo aenemman	peacefully
Ewor ke baj jemlokin ao idraak?	Will there be an end to taking pills?
Aspirin, *calcium*, uno in kirro,	Aspirin, calcium, gout medicine,
Uno kan *tyroit*	Synthroid
Uno kein im ba kaki remaron ke	Will these pills
in kakure *kidney* ka ao,	damage my kidneys,
komelij e ao,	my brain,
im menono e ao?	and my heart?

Figure 2. Lyrics, "Kajjitok in aō nan kwe kiiō" (2008), as performed by Iju in Eañ.

The song, performed a cappella, begins with the statement, "These are my questions for you now, still" (*see Figure 2*). The word "kiiō" (now, still) refers to something that is happening now *and* that is ongoing. Here, Marshallese language remembers temporal currencies where the "now" is the "still," which refute the point-based conceptions of the "just now" that undergirds American jurisdiction and spatiotemporal controls placed around the "nuclear affected." Kiiō animates the concept of currency, and with it current and currents that are central to hearing beyond modern temporal constructs of the now or the current moment. Listening can be an act of denuclearization when the core of songs, i.e., "sound," opens from percussive attack to resonant decay into an acoustic silence—all of which are part of the more-than-human movements of nuclear culture personalized by singers. In "Kajjitok," the lyrics mark something that is current and has currency; it is present in the word and moves through them, creating value within the relational context of the song.

Marshallese songs can be considered in terms of what Yuan Shu has called the "oceanic archives," which decentralize knowledge production and disrupt colonial epistemologies and sensible frameworks, such as the gaze in spatializing reach. Decentralization is a decolonial process and practice that counters hierarchical-based resilience. Oceanic archives take on their own interconnective, more-than-human temporalities, which can be appreciated in terms of having *currencies*.[15] Competing currencies, or friction between movements, gatherings, and circulations of things, come to a head when the economy (industrial pollution as plastic) dominates the "health" of oceans. Currency-based movements *redistribute* the nonbiodegradable materials and make them visible at different coordinates of an interconnected Earth. The Marshallese word for "sound" and "voice" is "ainikien," which literally translates to "current/gathering/circulating" (aini) and "rules/directions" (kien). Radiation songs, by way of their currencies, can help redistribute needs, knowledge, and information.

Radiation songs take up Marshallese legal and political petitions and give them currency. The musical petition contains the rhetorical and literal (figures of) questions, which work to engage the listener in a call to respond. The singers' lyrics give clues to what has been shared with them, as processes, that have become their lived experiences. Amidst the questions are lists of medicines that become embodiments of digestive time and side-effect half-lives, like radiation, which then becomes preoccupation, concern, and medical visits. The "side effects" are part of the full effects that enervate the women and bolster financial returns for the pharmaceutical corporations. Without sufficient responses to their calls prompted by imperial returns, the women sing that they have lost sleep—they are perpetually laboring for the neonuclear colony—and have no peace of mind, since the US has used atomic power as means to promote peace at their expense.[16]

Nuclear violences, which are also gendered violences, strikes the Marshall Islands's matrilineal customs in which the political power was customarily afforded to women, in particular the eldest sister. Although men would "voice" the political issues in negotiations, they developed practices that founded their positional orientations in gender complementarity with the women, since the women practiced communicative mediations, listened with the spiritual landscape and lineage (including humans and more-than-human animate spirits). As Kristina E. Stege recalls, women, customarily, were given the power as *leejmaanjuri* or the peacemaker (and peace-breaker) and caretaker; "Kajjitok" resounds how Western oppositional frameworks—here the refusal of non–state based political complementarity that maps onto the refusal of gender complementarity—has disabled their means of peacemaking.[17] The singers' voices, as women in their roles as peacemakers or -breakers, amplify how their peacefulness has been broken, such that their voices break; as peacemakers, their voices return. Over the course of the song, the interplay of voiced and unvoiced moments, which I describe below, can be read in the context of the women's struggle for peace and justice, which entails being part of the decision-making process, as Marshallese women.

During Iju in Eañ's NVSRD performance of "Kajjitok," the women's harmonies began to disentangle as their voices fell in volume in a rapid domino effect. The audience immediately began to clap. The conductor, Betty, turned to the audience. As she pointed to her neck, she shook her head and said, "ah, tyroit!" The audience applause diminished and the women picked up the song with slight acoustical dissonance that lessened as the women approached the final cadence. The vocal aphonia, I realized, was political and a recurring physiomusical technique employed during this and other Roñļap songs to amplify the radioactive movements that had stripped their energetic centers (thyroid, metabolism), spiritual connections (land–humans), and literal voices through layered biomedical, nutritional, and overall subjection to toxicity. The singers mark and must endure their subjection to ongoing radiation issues; they must use it to educate audiences that cannot hear and clap over this resonant space. For, it is in this resonant aphonic space where the framework from a future resilience (the singers sing again) or a past fullness (when the singers sang before their voices fell) is created to get to the "heart," as it were, of Marshallese Indigenous spiritual connectedness.

The ri-Roñļap were stigmatized when they tried to sing or speak, especially women, given that their voices would sound lower, like men's, in everyday situations. They were called "ri-baam" and shunned for fear, early on, of contracting radiation diseases. The thyroidectomies would alter their voices, with some atolls experiencing numerous extractions as a result of their proximity to the detonations. Anatomically, the thyroid can be considered part of the throat complex, or in Marshallese epistemologies, the boro, which is an intermediary of the person and the collective spirit (the vital world). Ionizing radiation can compromise the thyroid; many Marshallese had thyroid problems and had operations on their thyroids, which altered their energy, their vitality. The throat, in Marshallese body perceptions, is discussed in the same terms as the heart in Western perceptions of the body. The throat is the seat of the soul, the emotions, and vital currencies where things come in and out (like the heart in the circulatory system/oxygenation of blood). The heart transits, as well, in inspiration. It rests on the "inside" and needs the throat and nose to bring in air, oxygen. The throat also moves solids, liquids, tenses up and relaxes, and produces voice through the larynx, vocal folds, and resonator that is the mouth, which can be thought of as part of the throat complex. Not understanding how radiation spreads, Marshallese were fearful of contagion through Marshallese bodies when the ri-Roñļap would speak with altered voices. This is because sound intimates contagion.

Contagion and Resonance

Contagion refers to "the communication of disease from one person to another by close contact" and "the spreading of a harmful idea or practice."[18] Communication, or forming community, requires movement; sounds distinguish relative, or relational, distances and proximity and, listening to how sounds resonate (i.e., in ri-Roñļap women's radiation songs, the decay beyond the initial percussive attack), movement within singers and audiences, for example, can be detected. Something—whether

lexical, timbral, or musical—is being communicated. Yet, sonorous communication is more than the lexical, timbral, or musical; it is also comprised by the connective media, such as air and water, through which sounds move, vibrationally. These channels also carry viruses and invisible materiality that form consubstantial communities. They are the more-than-human constitutions of human communities, or political communities such as those subjected to toxicity. Community and communicable messages, ideas, diseases become part of the political voice, which is often reduced to an individual person's voice.

"She is singing like a man," Marshallese would often exclaim when I shared Valentina's song. I called a Marshallese colleague who lives in Arkansas, Sharlynn, from Epoon (Ebon) Atoll, the southernmost atoll in the RMI. As I played the recording over the phone, she exclaimed, "I know that song. It's a Bikinian song. She is singing like a man to imitate all the elder men—those leaders who were men, such as King Juda. The leaders would compose the songs, not the women. Most of our history is not written, it is passed down by our voices and movements."[19] Sharlynn's comment addresses how resonance works genealogically; resonance of voices and movements are the means of Marshallese generational histories. "Singing like a man" shares the gendered resonances of the masculinization and militarization of global politics.[20] Sharlynn refers to the widely mediatized exchange between King Juda, the leader of the ri-Pikinni, and US Commodore Benjamin Wyatt on the brink of US removal of the Pikinni community in 1946 to make way for nuclear testing. Today, RMI and Pikinni representative political organization is overwhelmingly male. In addition to the lowered voice due to thyroid surgeries, radiation can be heard in this materialization of masculine militarization that conveys that ongoing impact of nuclear damages to the constitution of women's political roles and matrilineal customs more broadly.

Sharlynn continued to analyze the performance based solely on listening. She stated, "There is no movement. She is sitting by herself, and because there is no movement, the voice must convey the meaning. She is not with us. She looks to the past and the future, but not now. Where can she survive? She is lost without her land, and it is like she is crying. This situation is beyond slavery." The removal of women from their homeland is one form of gendered violence, then, assumed by the throat as a marker of a severed matrilineal society. Their places destroyed, they labor for the nuclear colony with little to no compensation, and after not voting for the Compact, the money they were given was taken in part by the chief/president. The significance of the hearing is that resonant sounds of more-than-human communities, including the mediated broadcasts of the political, sculpted to excise women from the center stage, move through these songs along with radiation, pills, food, and drink. Radiation underlays the ascent of the male voice through political ("Radiation") as well as physiological ("Kajjitok") means.

Conclusion

The entire nuclear project is built on extraction and disposal of the toxic materiality that forms toxic communities. A nuclear future ignores its dependence on imperial projections that spatialize places through hazards of mining, storage, and transport. It ignores the overburdened healthcare system that might be forced to take on preventable nuclear injuries from a meltdown or even a small-scale nuclear war (since nine countries continue to have nuclear weapons). Marshallese persons have been used as guinea pigs; that does not make it acceptable to hear these songs as "warnings" of what might happen to "the world." These are not warnings—they are the underlying foundations, the conditions of what is happening now and still, which is the disablement of persons through categorical impositions of "culture," from race to gender to ability that delineate value placed on work, or the labor of life, in global community formation. It is my belief that we cannot change without systematic reflection on relationality and disconnection, since, as a global society, we are all implicated. US geopolitical frameworks—scientific studies, mass mediations, legal hearings, and political agreements—have systematically compromised both singers' voices and audiences' hearing of the breadth of radioactive damages.

Radiation songs complicate mass mediations of nuclear war, as a durative process, that ignore the daily routines of Marshallese health maintenance, emotional labor, and political activism (mostly unpaid). As Susan Buck-Morss writes, "[m]odern warfare cannot be comprehended as raw experience. Like many realities of modernity, war needs the prosthetic organ of the cinema screen in order to be 'seen.'"[21] Buck-Morss explains that "[c]inema creates an imaginable space where a mass body exists that can exist nowhere else."[22] The moving image cultivates globalizing sensibilities that demarcate the damages of war from everyday life. Nuclear imperialism is founded in war and colonialism, underlaying US capital and contributing to an underpaid workforce. Modern systems separate these interrelated geopolitical processes of economic accumulation and systematic decay that radiation songs make audible. In an era in which we need to be thinking more about more-than-human communities due to viral movements such as Covid-19 and climate change, radiation songs share the muscular and cultural memories of working intimately and globally beyond crisis time.

Notes

1 See Joel Gittelsohn, et al., "Macro-and Microlevel Processes Affect Food Choice and Nutritional Status in the Republic of the Marshall Islands," *The Journal of Nutrition* 133, no. 1 (2003): 310S–313S; and Pearl A. McElfish, et al., "Social Ecology and Diabetes Self-Management Among Pacific Islanders in Arkansas," *Journal of Family Medicine and Disease Prevention* 2, no. 1, (2016) for post-World War II food cultures in the Marshall Islands and rates of diabetes that create preexisting conditions.

[2] Rebecca M. Herzig, *Plucked: A History of Hair Removal* (New York: NYU Press, 2015), 5.

[3] Under the Clinton administration, an investigation of the US government's use of radiation experimentation on humans was conducted and the findings were released. See United States, *Final Report of the Advisory Committee on Human Radiation Experiments* (New York: Oxford University Press, 1996).

[4] Full recordings of the songs were unavailable as of November 2020. For partial video of "Kajjitok in Ao Nan Kwe Kiio," see Jessica A. Schwartz, "A 'Voice to Sing': Rongelapese Musical Activism and the Production of Nuclear Knowledge," *Music and Politics* 6, no. 1 (2012).

[5] Dorceta Taylor, *Toxic Communities: Environmental Racism, Industrial Pollution, and Residential Mobility* (New York: New York University Press, 2014).

[6] Ejit is an islet (about the size of a football field) where displaced ri-Pikinni live in order to be close to the RMI political capital, transportation, medical care, and other resources on Mājro (Majuro) Island, including the Bikini Atoll Town Hall, where one of the branches of the KBE (Kōle/Pikinni/Ejit) government operates. Kōle (Kili Island) is an individual island, not an atoll, where displaced ri-Pikinni live. Pikinni Atoll is in the northernmost part of the archipelago, and Kōle and Mājro Atoll are in the southern part of the archipelago, which has a different cultural/environmental climate.

[7] See Jessica A. Schwartz, *Radiation Sounds: Marshallese Music and Nuclear Silences* (Durham, NC: Duke University Press, 2021).

[8] Veit Erlmann, *Reason and Resonance: A History of Modern Aurality* (New York: Zone Books, 2010).

[9] Nina Sun Eidsheim, *Sensing Sound: Singing and Listening as Vibrational Practice* (Durham, NC, and London: Duke University Press, 2015), 154–184.

[10] See Janis B. Nuckolls, "Language and Nature in Sound Alignment," in *Hearing Cultures: Essays on Sounds, Listening, and Modernity*, ed. Veit Erlmann (New York: Routledge, 2004).

[11] Mechelins K. Iechad, "Nuclear Activity and Humankind: The History of Nuclear Activity in the Pacific and Women's Struggle for its End," (unpublished paper, Spring 2012).

[12] Marilyn Strathern, *The Gender of the Gift: Problems with Women and Problems with Society in Melanesia* (Berkeley: University of California Press, 1988): 131–132.

[13] For more information on Project 4.1, the US government's classified human radiation experiments, see Barbara Rose Johnston, and Holly M. Barker, *Consequential Damages of Nuclear War: The Rongelap Report* (Walnut Creek, CA: Left Coast Press, 2008).

[14] See Roberto Esposito, *Bios: Biopolitics and Philosophy* (Minneapolis: University of Minnesota Press, 2008).

[15] Walter D. Mignolo, "The Geopolitics of Knowledge and the Colonial Difference," *The South Atlantic Quarterly* 101, no. 1 (Winter 2002): 57–96.

[16] John Krige, "Atoms for Peace, Scientific Internationalism, and Scientific Intelligence," *Osiris* 21, no. 1 (2006): 161–181.

[17] See Kristina E. Stege, "An Kōrā Aelōn̄ Kein (These Islands Belong to the Women)," in *Land and Women: The Matrilineal Factor: The Cases of the Republic of the Marshall Islands, Solomon Islands and Vanuatu,* ed. Stege et al. (Fiji: Pacific Islands Forum Secretariat, 2008), 1–34.

[18] Definitions of "contagion" found in Lexico, *Oxford US English Dictionary,* https://www.lexico.com/en/definition/contagion.

[19] Sharlynn Lang, telephone interview with the author, February 2014. Note: King Juda was the leader of the ri-Pikinni in 1946 when they were removed from their atoll for US nuclear testing.

[20] Cynthia Enloe, *Bananas, Beaches and Bases: Making Feminist Sense of International Politics* (Berkeley: University of California Press, 2014). Also referring to the Nuclear Claims Tribunal and the (yet to be) awarded nuclear damages, see, Davor Pevec, "The Marshall Islands Nuclear Claims Tribunal: The Claims of the Enewetak People," *Denver Journal of International Law and Policy* 35, no. 1 (2006): 221.

[21] Susan Buck-Morss, "Cinema Screen as Prosthesis of Perception," *The Senses Still: Perception and Memory as Material Culture in Modernity*, ed. C. Nadia Seremetakis (Boulder, CO: Westview Press, 1994), 51.

[22] Buck-Morss, "Cinema Screen as Prosthesis of Perception," 51.

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