PART I

FREQUENCY-RANGE AESTHETICS

CHAPTER 2

TREBLE CULTURE

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> We've all had those times where we're stuck on the bus with some insufferable little shit blaring out the freshest offerings from Da Urban Classix Colleckshun Volyoom: 53 (or whatevs) on a tinny set of Walkman phone speakers. I don't really find that kind of music offensive, I'm just indifferent towards it but every time I hear something like this it just winds me up how shit it sounds. Does audio quality matter to these kids? I mean, isn't it nice to actually be able to hear all the different parts of the track going on at a decent level of sound quality rather than it sounding like it was recorded in a pair of socks?
>
> —A commenter called "cassette"[1]

> . . . do the missing data matter when you're listening on the train?
>
> —Jonathan Sterne (2006a:339)

At the end of the first decade of the twenty-first century, with the possibilities for high-fidelity recording at a democratized high and "bass culture" more globally present than ever, we face the irony that people are listening to music, with increasing frequency if not ubiquity, primarily through small plastic speakers—most often via cellphones but also, commonly, laptop computers and leaky earbuds.[2] This return to "treble culture," recalling the days of transistor radios or even gramophones and scratchy 78s, represents a techno-historical outcome of varying significance for different practitioners and observers, the everyday inevitability of "tinny" transmissions appearing to affirm a preference for convenience, portability, and publicity, even as a variety of critical listeners express anxiety about what might be lost along with frequencies that go unheard (and, in the case of bass, unfelt). From cognitive and psychological studies seeking to determine listeners' abilities to distinguish between different MP3 bitrates to audiophiles and "bass boosters" of all sorts lamenting not only missing frequencies but also the ontological implications thereof to commuters complaining about noisy broadcasts on public transport, there has already been a great deal of ink spilled over today's trebly soundscapes.

Beyond obvious differences in preferred or dominant frequency ranges, what I am calling "treble culture" differs from what others have celebrated as "bass culture" in ways that deserve some explication.[3] While a number of scholars and enthusiasts have waved the banner of "bass culture," it remains underspecified. In general, the term describes a preference for and permeation of musical life by low-end frequencies, a set of aesthetic priorities pioneered by reggae producers and grounded in the centrality of massive sound systems to the genre. As ethnomusicologist Ken Bilby bears witness, recalling an experience in a small Jamaican bar which, despite its size, boasted a powerful set of speakers: "It was the loudest music I had ever heard—louder even than the overdriven Marshall amplifiers of a hard-rock concert, but with one main difference: the loudness was concentrated in the all-enveloping rumble of the bass rather than in the searing treble of live guitar-driven rock" (1995:148). For many observers and practitioners, the cultivation and experience of such rumbling bass force has crucial phenomenological effects. Michael Veal, in his book on dub, situates Jamaican music's remarkable and consistently expanding low-end bias in the context of entrepreneurial and competitive practices, as well as the power of the musical experience it produces: "Ever since the R&B and ska years, when sound system operators pushed their bass controls to full capacity in order to *thrill and traumatize* their audiences and have their sounds heard over the widest possible outdoor distances, the electric bass had grown in prominence in Jamaican music" (2007:32, my emphasis). And Steve Goodman, a lecturer in Music Culture at the University of East London (also known as DJ and producer Kode9), extends this idea to argue that the deployment of bass and sub-bass frequencies, particularly in sound system contexts, represents an exercise in "fear activated deliberately to be transduced and enjoyed in a popular musical context" (2009:29).

While their philosophical implications remain up to debate, these preferences and practices have migrated through and beyond the reggae diaspora, into hip-hop and kindred electronic popular dance genres, and such bass-ful experience might be said to constitute a "culture" at least insofar as people have developed and sought out sound systems capable of delivering these frequencies in such ordinary contexts as cars, homes, and movie theaters. Indeed, one could contend that recent trends in the "treblification" of audio culture are paralleled, if not dwarfed, by a more longstanding process of "bassification," including the increasing availability of subwoofers in consumer-grade stereo systems or headphones with frequency ranges that dip down to 20 Hz. It is precisely the coexistence of these parallel trends that makes the sudden (re)ascension of trebly listening practices so striking. This chapter thus poses "treble culture" as a suggestive foil to "bass culture" in order to think through contemporary debates around emerging mobile musical practices, but I don't mean to suggest that "treble culture" is any sort of *fait accompli*. Unlike in "bass culture," few people seem to consciously fetishize the trebleness of sound, instead tolerating and using it as part of a portable music culture. Nevertheless, whether or not current trends in "treblification" constitute something akin to way of life, it is telling that observers, especially of a critical persuasion, often employ the term *culture* when discussing such phenomena as kids listening to music on their mobile phones.[4]

This chapter examines recent trends in "treble culture" in the context of twentieth-century precedents as it attends to new practices emerging with digital devices, as well as to the debates around them: among others, the class issues and racially tinged discourses around public projection of mobile sound (or "noise"), the socialization of personal mobile technologies via communal listening, the aesthetic shifts initiated by new modes of listening, and the novel representational strategies on the part of producers and engineers to compose music that "works" through such devices. Focusing in particular on the paradox of filtering bass culture through treble culture, but also taking a broader view of the phenomenon, this chapter traces the cultural and historical contours of treble culture in three parts: (1) an ethnographic overview of the everyday and public dimensions of treble culture; (2) an historical narrative placing treble culture in the context of a century of sound reproduction; (3) an appraisal of the aesthetics informing and emerging from today's treble-some predicament.

From Ghetto Blasts to Sodcasts

> when I went to brasil 2 winters ago
> I was really enthused by the fact I could hear funk everywhere in Rio
> even though it was supposed to be more marginal
> or at least that's what the newspapers were saying
> Funk in the street, funk at the ice cream van
> and more precisely
> funk on the beach at Posto 9
> on cell phones
> loud cell phones[5]

> Sodcasting (verb)—The act of playing music through the speaker on a mobile phone, usually on public transport. Commonly practiced by young people wearing polyester, branded sportswear with dubious musical taste.
>
> *Delia was exposed to hip hop for the first time last Wednesday, when, on the 75 bus to Catford, a youth was sodcasting from the back seat.*[6]

Welcome or not, it has become an everyday experience, a commonplace the world over, especially in cities: a teenager, or a group of young people, broadcasting a tinny slice of pop in public.[7] From London to Stockholm, Boston to Bamako, today's mobile treble culture permeates urban soundscapes. For some, these thin transmissions add but another layer of noise to the daily din, and, though this is not always the case, such assessments do often politicize particular sounds and sonic practices in the ways that "noise" sometimes entails (Attali 1985; Rose 1994; Biddle 2007). When played to captive audiences on a bus or train, cellphone broadcasts can be perceived as annoying, even threatening. Critiques of such mobile music frequently express anxieties about the social order, about unruly, unsophisticated "chavs" and "sods," bringing class and race

and age either implicitly or explicitly into the debate. Others hear in treble culture a reclamation of public space and an impulse toward communal musicking (Hancox 2010).

Whether framed as social or anti-social activity, however, what seems beyond dispute is the utter ubiquity of treble culture today. Remarkably, for all its omnipresence, the practice remains relatively undocumented. When I sought out examples of public discussions of the cellphone as mobile sound system, I was able to find relatively little in print, even as the subject seemed something of a settled matter, a cliché even. One UK-based music journalist replied to my query, via Twitter: "all i can offer for now is the 'cliche' london kids listening to grime on their phones on the bus."[8] And, indeed, one of the earliest print references I could locate documenting the practice was a significantly neutral, if not mildly celebratory, article about the resourceful use of mobile phones among London youth participating in the grime scene:[9]

> The success of a U.K. music genre known as grime, championed by the likes of Dizzee Rascal, has made rapping to mobile phones a popular pastime for a lot of British young people.
>
> On the street, cell phones enable impromptu rapping, or "spitting," over music played through speaker phones.
>
> If MCs or rappers want to try out their "bars," or rhymes, they can "flow" over beats played over the speaker phone. (Biddlecombe 2005)[10]

It is revealing that, at this point, the focus falls on the enthusiastic young users of the technologies themselves, rather than on the beleaguered greater public, who, as I explore later in this chapter, have increasingly become the louder voices in the current conversation about treble culture.

In the interest of offering more documentation than I could find in print, I polled friends, colleagues, and readers of my blog and Twitter feed for anecdotes about cellphones as mobile sound systems.[11] Allow me to share a small sampling to give a sense of the widespread nature of the practice, audible across the so-called developed and developing worlds alike, in rural and urban settings, and with positive, negative, and neutral valences for participants and observers. One friend, living in Mali, emailed the following report:

> The cellphone is by far the most ubiquitous personal music player—I think I've seen maybe one iPod here so far, and very few walkmen or portable CD players. Many young men (and some women) walk (or drive, on moto-scooters) around with earbuds in or hanging over their ears, in some cases just headphones for listening to music from their phones, in other cases earphones/microphones, for both phone calls and music. Small groups of people sitting on a corner drinking tea, or in a room waiting for dance rehearsal, will often be listening to music from someone's cellphone, the tiny speakers straining (and often distorting) as they tinnily reproduce the sounds of Nahawa Doumbia, Oumou Sangare, Aaliyah, etc. Though iPhones and Blackberries are extremely rare, a large percentage of cell phones here can serve as MP3 players, and have bluetooth connections—generally someone transfers songs from computer to phone via bluetooth (at a cyber cafe), and the tracks are

> then shared from one phone to another via bluetooth. Not surprisingly, one thus also hears all kinds of amusing snippets as ring tones—usually Western songs, even though the full songs people play from their phones are more often by Malian artists. A fair number of phones here also pick up radio and/or television (with extendable antenna) or play videos—more trebly, tinny reproductions.[12]

In contrast, a colleague in New York shared a more ambivalent account, one which subtly and not so subtly touches on issues of race, class, and age:

> In the subway, I feel tortured. Since I was a teen I've been pretty good at tuning out subway noise—preachers, boomboxes etc. But I find it harder to tune out the music leaking out of people's nasty little earbuds.
>
> I can pick individual songs out! Or at the very least the genre—the insistent high hats and cymbal smashing of speed metal, the exasperating dembow of reggaetón, the electronic loops of T-Pain voiced pop, the plink of bachata guitar. I never seem to be bothered by singer-songwriter stuff, or shoegaze rock or classical. Is it because of the tones or because those people never crank it up to 11?
>
> Worse, because it seems like a deliberate invasion of soundspace, is people listening to music on their cellphones in the subway. One, what exactly is it that people HEAR through those eeny meeny speakers? To me, it sounds just short of AM radio static. And then, because of the subway, people have to crank it up, further distorting whatever they're listening to. If I actually LIKE the song, it just ruins it for me. If I don't, it's enough to drive me to subway rage.
>
> I know that some of this is old-lady "dag-nab kids" complaining, but even with lots of punk and Motorhead concerts under my belt, I keep thinking, isn't this messing up their hearing? And why oh why do I need to hear the most piercing notes from ten speed metal songs in a row? Sometimes, it's not even the guy next to me, but the girl like ten feet away. If I can hear that, what the heck are they hearing?[13]

Although one might expect such sonic leakage on the subway, trebly emissions have become so commonplace that one encounters them even in contexts when greater sonic definition would seem desirable. Producer Ghislain Poirier admits that, unlikely as it would seem, laptops have become the new "boomboxes" in the bass-centric music circles in which he travels. As a result, a fair amount of guesswork infuses the listening process today, including the sort of specialist listening practiced by keen-eared DJs and workers in the recording industry:

> It's common in my circle to judge music, bass music I should say, through laptop speakers, even if we don't hear the bass. We just guess where it is. I've seen that with DJs, producers and labels peoples. Primarily because the laptop is right there in your face, it's the main object you work with. . . . When you travel and meet people on the road, the laptop is the boombox.[14]

And yet despite how it suffuses urban experience, today's treble culture is by no means restricted to cities. As cellphones and laptops have become everyday listening devices everywhere, they can be heard wanly but effectively propelling group activity in rather

unlikely circumstances, especially when hi-fi alternatives are not available. One colleague wrote to share a story about a family reunion in a remote part of Wyoming:

> We traditionally have a dance when we get together. This time we were in cabins in Nowhere, Wyoming sans electricity. Folks hadn't really thought out the music piece of this beforehand. My youngest sister was in charge of the jams and pulled out her laptop. Those inclined to dance hung around her in a tight circle, trying to stay close enough to reasonably hear the not-booming built-in speaker.[15]

These stories affirm my own everyday experiences over the last several years, in meatspace and cyberspace, witnessing a sort of treble culture in full bloom whether via dance videos on YouTube where the soundtrack is clearly provided by a tinny device or in mundane encounters on the streets and subways of Cambridge and Chicago.[16] I recall, among other notable examples, watching a trio of dancers take a break from the powerful sound system of a Boston nightclub by gathering outside around an iPhone playing a Bee Gees song, possibly streaming from a YouTube video (and hence with added degrees of bass attenuation, as I will discuss in the next section). And a remarkable percentage of teens I pass on the sidewalks of Cambridge—especially, but not exclusively, when in groups or pairs—include at least one person broadcasting a trebly slice of hip-hop, r&b, reggae, or reggaeton. Given the apparent lack of attention to whatever song is playing, the practice sometimes seems to serve an ambient function, maintaining pop's presence in their lives (and, whether I like it or not, mine), especially by keeping the latest hits in the air. In doing so, these "expressive youth," as Christian Licoppe would call them, also project a sense of selfhood, neighborhood, or even nationhood, the blasting cellphone serving as an important if often unremarked bit of accompaniment, marking them as hip or brash much as a particular ringtone might or—via visual cues—a fresh fitted cap or a pair of trendy jeans.[17] Like the bass-riddled rattling of car trunks, which, amidst and against treble culture, maintain a strong sonic presence in the streets of my city and many others, these distorting pieces of plastic serve as announcement, accompaniment, and accessory alike.

More than their affront to high fidelity, however, it is these devices' ability to call attention to themselves, to bleed outward from the immediate group (or individual) into shared social spaces, which most raises the ire of certain observers. For a variety of reasons, including population density, diversity, and relative levels of development and privilege (i.e., broad access to mobile electronics), the UK—and London in particular—has been the site of a great deal of hand-wringing over treble culture, as well as celebration of it. In the debates that have ensued, questions of class and race frequently come to the fore. An article in *The Guardian* about commuting, for instance, contains a complaint from a bus-rider who not only imagines a violent response to any requests to turn the music down but seems to racialize the threat as well:

> Jennifer van Schoor, a freelance graphic designer in London, says endless roadworks have made her consistently late for work in the past few months. "Often I get off the

> bus and have to walk, but I resent having to do that because I've paid £90 a month for my travelcard."
>
> A recent increase in aggression and noise pollution on buses hasn't helped. "Either I'm listening to someone talking on her mobile about how she's broken up with her boyfriend, or I've got some little pipsqueak next to me who's playing some 'doosh-de-de-doosh' music. If I say anything, who knows—maybe he's going to stab me." (Viney 2008)

Affirming this sentiment, some London commuters based in the borough of Enfield began a "Music Free Bus Campaign," calling for a total ban of music on buses, motivated by fears that direct complaints to treble-casting kids about public noise could result in physical or verbal violence. One of the organizers of the campaign shared his frustration with a local newspaper, conjuring a gang of teenagers in order to set an intimidating scene: "People think they can sit on a bus and blast music out, and when you ask them to turn it down you get the abuse, especially from teenagers. I am not surprised people do not say anything because if I saw a group of seven or eight people playing music I would not go up to them, but if TfL [Transport for London] advertised it on the bus, we could point to the sign to show them it is not permitted."[18]

Although sometimes couched in subtle or euphemistic language, the conversation about trebly transmissions on public transport frequently opens into debates about race and class. Consider, for example, an exchange at drownedinsound.com, a UK-based music webzine and forum, which recently hosted a discussion of contemporary sound quality and, inevitably, of "music on buses." One commenter explicitly connects the "chav's [sic] walking around playing music through their phone's [sic] speakers" to earlier figurations of race, space, and noise, opining that today's cellphone-infused soundscape "is really no different to the eighties when people used to walk around with a 'ghetto blaster' on their shoulder."[19] Whether race or class is implicitly or explicitly invoked, however, the valence is not always necessarily negative. As another commenter added to the same discussion thread, "I like kids playing tunes off their mobiles":

> Where I live they mostly play Grime, Funky or Dancehall so its [sic] actually a good way to keep up with new tunes. I think sound quality does still matter to a lot of people, but of course it depends on context and financial circumstances. Playing music on the bus is about showing off, not actually listening so it doesn't really matter how it sounds.[20]

It is telling that the genres named here are all associated with London's black underclass. For the defenders of so-called "sodcasting," a condescending pun which journalist Dan Hancox calls "a pretty horrible, New Labour-esque neologism," part of the appeal of today's trebly public soundings is, at least in part, due to their militant projection of music that carries a certain charge in a postcolonial, multicultural society. For Hancox, the practice represents "much more than anti-social territorialism"; rather, for him, given the context of legal and technological enclosure whereby the Metropolitan Police Service of Greater London single out "black music" as the target of their actions,

"sodcasting represents a vital, politicised re-socialisation of public culture, through the collective enjoyment of music."[21]

UK-based author and blogger Owen Hatherley appears to agree with Hancox, at least in part and in spirit. In February 2008, he mounted a "(partial) defence" of sodcasting on his blog. Hatherley's sympathetic account is motivated by a recognition of a kind of inherent communality that works against the grain of individualized, isolated musical experience, as well as by an aversion to the barely veiled racism at the heart of so much criticism of the practice:

> That [i.e., "sodcasting"] being the apparent neologism for the recent phenomenon of bus passengers, usually young and in the euphemism of the day 'urban', playing music from their phones or iPods out loud rather than on headphones. . . . By all means, the chap with Newham Generals [a local rap group] blaring out at the back of the bus will be enormously irritating to most folk without interest in such things. Yet: doesn't this go against so many of the trends in how music is listened to and consumed (*i*Pod, *My*Space, etc etc)? The aforementioned public broadcaster *wants everyone else to hear the music.* It would actually sound more powerful, more bass-heavy, more audiophile to listen to it on the headphones rather than screeching out of a tiny, tinny speaker. It's not for his own benefit, it's for everyone else. Sure, there's a fuck-you, anti-social element to that, which is the only element anyone seems to have noticed. But isn't there also an attempt, doomed obviously to failure, to make the music public again, to have it listened to outside, in groups? You can see a hint of that when it's a group, rather than one person, listening together to the bleeps coming out of the mini-speakers over the rickety roar of the bus.[22]

Notably, some of the comments on Hatherly's post reenact the very prejudices that he assails as "euphemistic." Take, for instance, two successive comments, one apparently issuing from the UK (note the disparaging reference to "West Midlands"), the other from Ontario (and hence explaining the use of the term "aboriginal," rather than, say, "urban"):

> a very public sociologist said . . .
> Music played off mobile phones sounds incredibly naff. In my experience the kids who play always seem to insist upon those really irritating urban grooves that feature munchkins on the vocals. Is this just a West Midlands thing? Do fans of a particular genre of music have a propensity toward exposing us to their taste?
>
> cain_devera said . . .
> Yes they do, or at least where I live; rap is almost exclusively the music that people play loud and 'obtrusively' on buses, which also happens to be played mostly by poorer teenagers, usually aboriginal.

For all the casual racism and class prejudice that creep into the pubic debate, not all complaints and worries about being assaulted by teenagers asked to turn their music down are groundless, though, again, I have found little beyond anecdotal evidence to confirm such claims. Commenting on Dan Hancock's post about sodcasting, Tan Copsey frames

the practice as "a means of creating confrontation": "I've seen it used as a prelude to threats of both normal and sexual violence. Can be especially nasty for women who dare complain." Finessing his point to address the question of reclamation of public space celebrated by the likes of Hancox and Hatherley, Copsey adds:

> Public spaces like this have to be negotiated not reclaimed. Sadly in my experience most people playing music do not respond well to requests to turn off their music from others. I think if another member of the public asks you to you have a responsibility to take their concerns seriously. In my experience most people don't seem to and on a number of occasions this has resulted in pretty nasty verbal threats from those playing music.[23]

Obviously context is crucial. Other anecdotes attest to the community-building effects that can emerge from making due with the trebly resources at hand. Gabriel Heatwave, a London-based reggae DJ, left a comment on my blog describing a recent scene in which his phone stood at the center of a communal, social moment:

> I was at a festival recently, and about 4 in the morning when the stages were shutting down, we ended up sitting round listening to tunes on my mobile phone. Someone showed me that if you put the phone in a paper/plastic cup it amplifies the speaker output and gives it more bass. It made a big difference, though it wasn't Stone Love [a popular Jamaican sound system] or anything still. We called it rave in a cup:-)[24]

As this vignette reminds us, occurring immediately after some serious immersion in bass culture, few people listen to music exclusively in trebly circumstances. Rather, as my attempts at ethnography seem to illustrate, a range of life contexts determine the degree of low or mid-range frequencies audible and present.

What emerges as salient across all these accounts is the insistent, if not insurgent, importance of portability—frequently trumping fidelity—to the ways we listen to and share music. As much as we seem to want our music rich in frequencies and full of dynamics, we also clearly want it to be mobile. These competing desires draw us into a basic dialectic of the history of the recording industry, or—more broadly even—of the history of recording and transmitting sound. Indeed, reaching back to the dawn of sound reproduction, we can observe a steady, alternating march between what Greg Milner calls "perfecting sound forever" and making music mobile (often by making it trebly). As early as the 1910s, Milner notes, when choosing between Thomas Edison's cylinders and his competitors' discs, "the typical music buyer was willing to forgo some elusive sonic pedigree for the convenience and lower cost of discs" (2009:47).

A Brief History of Fidelity versus Portability

> The history of sound reproduction in the twentieth century is not, as sales literature might suggest, a story of ever increasing fidelity, and it may very well also not be a history of audiences who really care about greater fidelity. Even the quite notable increases in sonic definition are really a side-story. Recording has both space- and time-binding characteristics. And the more remarkable story of sound reproduction in the last hundred years is a spatial story, about how recorded and transmitted sound became more portable and suffused an ever growing segment of people's everyday lives, both during hours of waking and during hours of sleep.
>
> —Jonathan Sterne (2006a:345)

Media scholar Jonathan Sterne's contention that portability has mattered as much as fidelity in the history of sound reproduction is instructive if we seek to put today's treble culture into context. Rather than representing the embrace of compressed digital audio and tinny mobile devices as an aberration, scholarship on the history of sound reproduction bears witness to a longstanding if not fundamental dynamic between making music as big and rich and full as possible (whether guided by ideals of sonic realism or studio-abetted surrealism) and making music more easily transmitted. Given contemporary anxieties over "treble culture," whether concerned with public noise (as detailed in the previous section) or with ontological and phenomenological loss (as I'll discuss in the next), it seems crucial to recount the various ways that music, in its ongoing dance with production and transmission technologies, has become trebly over the course of the last century. One might go so far as to contend that the history of recorded sound to date, especially at the so-called "consumer" end, is one in which treble predominates. So, how did we get here? Let us count the ways.

Before discussing technologies of sound reproduction per se, we might begin with the humbling fact that our ears themselves are, in present day lingo, "lossy." This recognition can be traced back at least to sound reproduction pioneer Thomas Edison, himself hard of hearing, who would literally sink his teeth into the wooden bodies of his phonograph prototypes in order to better "hear" what they were playing. As Greg Milner relays, "[Edison's] research had convinced him that the three small bones in the ear that convey sound waves from the middle ear to the inner ear were strikingly inefficient. 'There is a good deal of lost motion in those bones,' he said. 'Part of every sound wave that enters the ear is lost before it reaches the inner ear' " (2009:40). Edison's teeth remind us that, regardless of the various sorts of loss occurring throughout the sound reproduction process (not to mention the biological and psychoacoustic dimensions of listening), people have a remarkable ability to naturalize what they hear as possessing fullness and depth, never mind verisimilitude, despite how frequency-impoverished a recording, or

listening experience, may be.[25] To take another early example, when Valdemar Poulson, the "Danish Edison," unveiled his telegraphone in Paris in 1900, "People heard its tinny, fragile sounds, and remarked on how natural they were" (109). The tendency for audiences at "tone test" concerts in the early days of phonographs and gramophones to be gleefully "tricked" into being unable to distinguish between a live performer and a recording serves as testament to the commonplace acts of self-deception or auto-correction inherent to the listening process. Notably, such reactions are not limited to the dawn of the era of sound reproduction. As Milner recounts in *Perfecting Sound Forever* (2009), such scenes play out over and over again throughout the twentieth century—beginning with demonstrations by the likes of Edison and Poulson, continuing with Bell Labs and electrical recording in the 30s, Ampex and magnetic tape in the 50s, and up through the debut of compact discs in the 80s—and indeed, we might see recent tests of college students' perception of MP3 compression rates as but the latest instance of our abiding interest in the ability to appreciate audio fidelity (Salimpoor et al. 2007; Pras et al. 2009; Spence [Berger] 2009).

We might proceed then from the acknowledgement, perhaps surprising to some, that access to audible, never mind palpable, bass frequencies via sound recordings is, really, a relatively recent development and perhaps remains as much a luxury today—requiring powerful equipment and thus, typically, a trip to a club or concert venue—as it always has been. Along these lines, another basic point to bear in mind, as Fletcher and Munson proved in the 1930s, is that lower frequencies actually need to be louder than higher ones in order to sound equally loud to a listener. Some playback equipment compensates in this manner, using Fletcher-Munson curves—think of the "bass boost" button on a Walkman or a home or car stereo system. Magic buttons or no, this sonic principle reminds us how important volume—and hence context—can be in determining the overall balance between treble and bass. Today's commonplace personal listening scenarios can often mean that "real" bass—the sort that produces palpable, not just audible, vibrations—is a rarity. Listening to low bitrate MP3s on cellphones is, however, only the latest scenario. Frequency attenuation has been a recurring issue in the history of musical media—sometimes due to limitations of recording or reproduction technology, sometimes as a choice on the part of people who prioritize portability. "Every time the signal got clearer," Sterne reminds, "artists, musicians and engineers sought out new methods of distortion. And every time the bandwidth grew, engineers looked for new ways to make recorded or transmitted sound more mobile, more flexible and more ever present" (2006a:345). To put a fairly fine point on it, he continues: "The history of digital audio is only partly a story about the definition of sound. It is also a history of transmission" (345). This contention motivates the present section of this chapter, an attempt to sketch out the intertwined histories of definition and transmission in sound reproduction technologies and the degree to which we have always lived in a certain state of "treble culture." As such, we will take into account recording technology (from acoustic to electric to digital), sound media (records, cassettes, CDs, MP3s, etc.), and listening devices (e.g., radios, hi-fi—and lo-fi—home stereo systems, walkmen, iPods, cellphones and laptops).

That trebly emissions are a longstanding phenomenon, predating the digital by decades, is probably not news to many. Indeed, a contemporary notion of "treble culture' only makes sense in reference to the more recent rise of "bass culture" (especially since the rise of home and automotive hi-fi systems). Cylinders, 78s, and other early sound media are well known for their tinny qualities. That such media initially carried only acoustically produced recordings, prior to the advent of electrical means in the 20s (i.e., microphones and amplifiers), only further muted any semblance of bass. Fewer recognize that 33rpm LPs and even 45rpm singles are themselves subject to physical limitations on the amount of bass they encode (an irony given how the 45 was, for decades, reggae's primary medium—not to mention acetate "dubplates"). It was not until the appearance of the 12" single in the 70s—a development informed by, and encouraging, the practice of disco DJs—that a record's grooves were wide enough to accommodate a dynamic range permitting a level of bass presence that did not require additional amplification per se. Because deep grooves were difficult to manage prior to the 12" and because a stylus has inherent difficulty picking up sounds in the mid-to-high range, records were often purposely made more trebly. Interestingly, foreshadowing today's debates about aesthetics in the age of "sizzling" MP3s (as we will explore in the next section), audio equipment expert E. Brad Meyer (1996) argues that these frequency-response errors end up "crucial" to the LP's very "musicality":

> Many links in the recording chain, including the microphones, were designed with LPs in mind, so many master tapes are too bright in the upper midrange and lower treble. The LP system tends to tame that hardness. Otherwise, the sound is always mildly irritating, and the listener is slightly but constantly repelled, making it very hard to relax and enjoy the music. (quoted in Milner 2009:229)

Due to such technical constraints, even when electrical equipment made it possible to record and amplify bass frequencies, producers would continue to push high frequencies while reducing lows, and playback equipment compensated by boosting bass via a built-in amplifier (or "pre-amp"). Gronow and Saunio, historians of the record industry, explain how this procedure could, nevertheless, serve to improve dynamics and sonic definition:

> With the advent of electrical recording, the record company engineers began consciously manipulating the recording characteristics of their equipment. Strong bass notes, which could now be captured with the microphone, could easily destroy the groove of the recording. On the other hand the surface noise of a record is strongest in the high frequencies, which the improved amplifiers were now picking up. It was thus necessary to attenuate the low frequencies in recording, and boost the treble. When the record was played, the amplifier performed the same operation in reverse. Thus it was possible to improve the dynamics of the records and reduce background hiss. (1998:56)

The rise of the bassier record pre-amp notwithstanding, the tendency to produce trebly recordings was exacerbated in the age of transistor radios, especially during the 1960s.

Sensitive to consumers' primary listening contexts, popular producers such as the UK's Joe Meek, Phil Spector (of "Wall of Sound" fame), and Berry Gordy of Motown pushed treble further to the fore. As Greg Milner describes it:

> One of the keystones of this new consumer youth culture was the emergence of the portable transistor radio. And Meek and Spector's blatant quest for hits led both of them to make music that sounded like it belonged there. Their music, and indeed most of the pop music of the era, was purposefully produced to sound optimal on an AM station as heard through a tiny speaker. That's why so much of the music sounds excessively tinny to us today. . . . Meek and Spector embraced this new world as individual auteurs, but if there was one label that collectively institutionalized a radio-ready aesthetic, it was Motown. (2009:154–55)[26]

This techno-historical moment calls attention once again to the give-and-take between high fidelity and portability; in particular, it reminds us of the central role that so-called consumers—or perhaps consumer electronics manufacturers—have played in affecting the very process of recording and the aesthetics of popular music. It also moves us toward a consideration of the dialectics between a particular historical moment's popular listening technologies and its range of aesthetic positions, a dynamic we will consider in greater detail with regard to today's treble culture in the next section.[27]

The importance of radio in pushing music further into the treble range brings us back to the crucial question of what happens to sound at the listener-end of the process—that is, how sound which has been recorded and rendered to media again becomes audible. At various points in the chain from producer to receiver, a recording might be mediated by a variety of transmission channels, media, and playback devices, all of which can have effects on the sound. Radio, including both AM and FM, introduces a variety of its own technical limitations, not to mention the distorting effects—especially with regard to dynamic range—of various kinds of compression (especially, in recent years, a la the "loudness war").[28] These effects extend to other popular broadcast media: television, of course, and more recently a host of "streaming" sites and services via the Internet. Not only do such broadcast technologies frequently impose their own degree of compression to keep levels even, but the equipment used to receive them—whether a TV set, a portable radio, a home stereo-system or boombox, computer speakers (including, in particular, those built-into laptops), or mobile devices (especially phones) and their leaky earbuds—also tend to feature, with the exception of "hi-fi" systems, less-than-impressive speakers, introducing additional layers of attenuation to the playback process. In the case of laptops and their built-in speakers, which increasingly mediate a great swath of everyday musical experience (at least for the laptopped classes), bass suffers particularly. In the age of streaming audio via the Internet and smartphones, moreover, listeners are as likely to listen to a song via a site such as YouTube or MySpace (which also further compress audio content). Compression and attenuation compound, over and over again, and the more mobile music becomes, typically the more trebly too.[29]

This brings us, finally, to the import of digital audio to treble culture. Here we should return to the work of Jonathan Sterne, who again offers a historical corrective that may

seem more persuasive in light of the time line noted previously: "Audiophiles may consider digital audio—especially in its compressed form—as a giant step backward in a story of ever increasing sonic definition, but that story of progress never really quite happened" (2006a:345). Instead, Sterne offers an altogether different orientation with regard to digital audio: "Regardless of whether potential definition is increased or compromised in a particular form, digital audio is incredibly mobile and incredibly social" (346). Moreover, for all the complaints about the lossy qualities of compressed digital audio, it is important to note that MP3s and their ilk do not necessarily privilege treble over bass. Rather, both low and high frequencies—and plenty in between—can be removed during the encoding process, which uses what Sterne calls three "psychoacoustic acoustic tricks" to reduce the size of the files. Sterne's lucid explanation of these three procedures, what he calls "auditory masking, temporal masking and spatialization," is worth quoting at some length as he helpfully demystifies a little understood but ubiquitous technology:

> Auditory masking is the elimination of similar frequencies, based on the principle that when two sounds of similar frequency are played together and one is significantly quieter, people will hear only the louder sound. Temporal masking is a similar principle across time: if there are two sounds very close together in time (less than about five milliseconds apart, depending on the material) and one is significantly louder than the other, listeners can only hear the louder sound. The third principle is spatialization. While it is very easy to locate the direction of sounds in the middle of the audible range when they are played back in stereo, it is close to impossible for people to locate very low or very high sounds. To save more dataspace, the mp3 encoder saves sounds at either end of the frequency spectrum only once for both channels, rather than twice and plays them back as mono files. Since most human adults cannot hear above 16khz, some mp3 encoders also throw out all the data from 16–20khz to save even more space. Psychoacoustically, the mp3 is designed to throw away sonic material that listeners supposedly would not hear otherwise. (2006b:834–85)

To illustrate the rather incredible bag of tricks this is, Greg Milner notes that "between 80 and 90% of the music is simply discarded" (2009:357) in the conversion to MP3 (or AAC, the iTunes default, as well as other compressed formats). For Sterne, the MP3 thus contains in its very code "a whole philosophy of audition" which exploits or even celebrates "the limitations of healthy human hearing" (2006b:828). But again, a lot of the so-called "loss" that results from the encoding process is inconsequential—a point which no doubt rankles the same audiophiles who might bemoan the loss of transients or "presence" in moving from vacuum tubes to solid state or 16 tracks to 24.[30] "The key point," argues Sterne, "is that while traditionally, sound reproduction technologies have been theorized in terms of their relation of absolute fidelity to a sound source, the human ear is not capable of such fine distinctions. In fact, people can lose most of the vibrations in a recorded sound and still hear it as roughly the same sound as the version with no data compression. This is the principle upon which the mp3 rests" (2006b:834).

What this underscores about the MP3 is that its very design dovetails with the preference for portability and with the diverse, often "imperfect" listening contexts that have come to define everyday musical experience in the first decade of the twenty-first century. And yet, as with previous patterns in this give and take between fidelity and portability, we find plenty of detractors among the critical observers of contemporary audio design. John Atkinson, editor of *Stereophile*, a magazine devoted to high fidelity sound and the expensive equipment that makes it possible, expressed his frustrations with this pendulum swing toward portability in a February 2005 newsletter:

> One of the factors that has increasingly marginalized the high-end audio industry is the lack of attention paid to sound quality in the music industry: If there's no more quality to be retrieved from an overcompressed, overequalized, overprocessed, underdithered, underperforming MP3 than can be obtained from playback on a computer via a pair of pitiful plastic PC speakers, then why should anyone bother with putting together a high-performance audio system?[31]

Atkinson is quite clearly at odds with Sterne's central contention that the MP3's design favoring "easy exchange, easy storage and maximum portability" is not an aberration in the history of recorded sound but rather that such a product "has been a long-term goal in the design of sound reproduction technologies" (2006a:345). Then again, Sterne's argument is precisely that the MP3 was designed not with a hi-fi setting in mind but "to be heard via headphones while outdoors, in a noisy dorm room, in an office with a loud computer fan, in the background as other activities are taking place and through low-fi or mid-fi computer speakers" (2006b:835).

Interestingly, Atkinson's audiophile aversion to the MP3 finds shared skepticism among unlikely allies. Steve Goodman, author of *Sonic Warfare* (2009), contends that, "just as there is 'expert decision' making going on behind the supposedly psychoacoustic criteria involved in perceptual coding of mp3s that favors certain average frequencies over others . . . there is a politics of frequency that permeates the whole technical ecology of sound recording, storage and playback devices."[32] Rather than audiophilia, however, Goodman's comments are motivated by a studied distrust of the intersections between the military-industrial complex and sound reproduction technologies. If our present moment of treble culture can be characterized as one of "ubiquitous music," Goodman fingers corporations such as Muzak for initiating, "our submersion into a generalized surround sound culture, the insidious purr of control and the digital modulation of affective tonality that smoothes the experience of the ecology of fear" (2009:144). As a producer working in and across genres that privilege bass frequencies, Goodman's suspicious take on contemporary "politics of frequency" is directly connected to his immersion and participation in bass culture.

Notably, as it has provided a locus for a great deal of conversation and contestation over the public nature of treble culture, the United Kingdom—and London in particular—has also, as a crucial node in the Jamaican diaspora and reggae industry, long served as a central site in global bass culture. Over the last decade, playing to what Greg Milner calls our "twenty-first-century ears" (2009:11), producers from London and the

greater United Kingdom—and, of course, in musical metropoles the world over—have been among those who have embraced both the possibilities and limitations of contemporary treble culture, squeezing and filtering and creatively representing bass "weight" through today's commonplace technologies of circulation and listening.

Blog House, Ringtone Rap, and Bass Imagination

> Constant copying erodes data storage, degrading image and sound, overwhelming the signal of media content with the noise produced by the means of reproduction. . . . In this way, piracy creates an aesthetic, a set of formal qualities that generates a particular sensorial experience of media marked by poor transmission, interference, and noise.
>
> —Brian Larkin (2004:190–91)

> The odd angles and eerie spaces in productions by Mannie Fresh or Mr Collipark were flattened out, replaced by portentous digi-synth fanfares and lumbering beats, a brittle bass-less blare that seemed pre-degraded to 128kbps to cut through better via YouTube and mobile phone ("ringtone rap", some called it).
>
> —Simon Reynolds (2009)

Regardless of the codec or medium in question, ultimately all sound must be processed by our ears, our bodies, and our brains, all of which entail physiological and enculturated processes. Jonathan Sterne's provocative contention that the MP3 "plays its listener" (2006b:835) offers a stark acknowledgement of all the work that goes on in our heads when we listen—and how much of that work might be done for us before the act of listening even begins. But an attention to the act of listening (never mind dancing) to MP3s, or to any music emanating from the tinny speakers of a laptop or cellphone, extends beyond psychoacoustics and into the realm of culture and aesthetics. As popular practice bears witness and as several studies have shown, plenty of people have happily accepted the ubiquity of the MP3 (Salimpoor et al. 2007; Pras et al. 2009; Spence [Berger] 2009). Indeed, some—including musicians and other "expert" listeners—actually prefer the telltale "sizzle" of (relatively) low bitrate digital audio, recalling how their peers with 1960s ears gravitated toward Motown's radio-ready sound. Moreover, following in the footsteps of producers like Berry Gordy and Phil Spector, and their many acolytes over the years, contemporary producers sometimes explicitly work with today's trebly media in mind, transposing "bass" lines into higher octaves or shaping synthesizer patches so that they seem to come to life when broadcast from a thin piece of plastic. Listening to bass culture through treble culture at the close of the first decade of the

twenty-first century, we can behold a set of aesthetic preferences and procedures bridging the wide worlds of hip-hop and r&b, reggae and dubstep, techno and house, and a wide variety of contemporary genres and styles—some of which, like "blog house" or "ringtone rap," have acquired snarky monikers describing their sonic profiles and primary listening contexts. Tracing the contours of this feedback loop between producers and listeners, our exploration of aesthetics in today's treble culture will consider two main questions and their implications: 1) the resurgent concern with quality or fidelity and, in particular, of the audibility (or not) of digital artifacts; 2) how producers appear to be working with new listening technologies and contexts, rather than struggling against them.

Let's begin with an entertaining and instructive conversation between New Yorker music critic Sasha Frere-Jones and Radiohead guitarist Jonny Greenwood:

SASHA FRERE-JONES: Is the MP3 a satisfactory medium for your music?
JONNY GREENWOOD: They sound fine to me. They can even put a helpful crunchiness onto some recordings. We listened to a lot of nineties hip-hop during our last album, all as MP3s, all via AirTunes. They sounded great, even with all that technology in the way. MP3s might not compare that well to a CD recording of, say, string quartets, but then, that's not really their point.
SFJ: Do you ever hear from your fans about audio fidelity?
JG: We had a few complaints that the MP3s of our last record wasn't [sic] encoded at a high enough rate. Some even suggested we should have used FLACs, but if you even know what one of those is, and have strong opinions on them, you're already lost to the world of high fidelity and have probably spent far too much money on your speaker-stands.
SFJ: Do you think any of the MP3 generation—ten- to twenty-five-year-olds—want a higher quality experience?
JG: No. That comes later. It's those thirty-something men who lurk in hi-fi shops, discussing signal purity and oxygen-free cables and FLACs. I should know—I was very nearly one of them.
SFJ: What are your feelings about the various audio formats?
JG: Sonic quality is important. I'd feel frustrated if we couldn't release CDs as a band, but then, it only costs us a slight shaving of sound quality to get to the convenience of the MP3. It's like putting up with tape hiss on a cassette. I was happy using cassettes when I was fifteen, but I'm sure they were sneered at in their day by audiophiles. If I'm on a train, with headphones, MP3s are great. At home, I prefer CD or vinyl, partly because they sound a little better in a quiet room and partly because they're finite in length and separate things, unlike the endless days and days of music stored on my laptop. (Frere-Jones 2009)

What I would like to highlight here is the guitarist's attention to specific listening contexts and, in particular, his mention of a "helpful crunchiness" offered by MP3s. Figuring the MP3 in this manner, as a format with distinctive and even preferable timbral qualities, underscores how the MP3 has become an object of aesthetic value in its own right, embodying a particular moment in techno-historical time, a periodized sound. In this

sense, one might appreciate the "crunchy" qualities of an MP3 alongside its predecessors in musical media. Listeners have, of course, long enjoyed—and even fetishized—the sound of a particular medium. The crackle of a dusty record, for instance, is prized by vinyl lovers and became a signpost of authenticity among hip-hop producers in the 1990s (Marshall 2002, 2006), and in recent years even cassette hiss has found its nostalgists and recuperators (Link 2001; Keenan 2009).

For the MP3 generation—and it is telling that Greenwood and Frere-Jones make explicit reference to age in their conversation (not to mention gender)—the audible artifacts of bitrate compression can add a bit of desirable "crunch" or "sizzle" to recordings. Through the wonders of habituation, such timbral effects, however subtle, have rapidly been naturalized as downright constitutive of the sound of music today. In other words, the very things that may be anathema to "those thirty-something men who lurk in hi-fi shops" are the same qualities which have engendered an actual aesthetic preference for many. Notably, while some studies have demonstrated that listeners from a variety of backgrounds—in particular, "expert" listeners (i.e., people with years of musical training or practice)—are not only able to distinguish but indeed prefer "CD quality" audio to low bitrate MP3 files (up to 192kbps), others have suggested that this preference can swing in the other direction, especially among young people (i.e., college students).[33] Testing and polling his students over an eight year period by playing them different encodings of the same song, Stanford music professor Jonathan Berger found "not only that MP3s were not thought of as low quality" but that "over time there was a rise in preference for MP3s" and, more specifically, for what Berger calls their telltale "sizzle" or "metallic" sound (quoted in Spence 2009).

Since the naturalization of MP3 "sizzle" and the widespread adoption of "tinny" listening devices, musicians and producers have had to grapple with this predicament.[34] For those who see no choice but to embrace music's contemporary technological circumstances, opportunities for tailoring music to treble culture arise both during the production phase—with regard to the type of sounds used and frequencies foregrounded—and in mastering (i.e., the stage at which loudness and particular frequency bands can be boosted and refined). Among other anecdotes, I was told of engineers being asked by the bands they recorded to master the music not necessarily *for* MySpace but in order to sound *like* MySpace.[35] And Steve Goodman / Kode9 affirmed, from his perspective as head of the Hyperdub label, that "tracks get EQd and mastered with [treble culture] in mind, to make the tracks brighter than you might think is necessary or comfortable to listen to in the studio."[36] In this way, contemporary producerly practices recall the radio-friendly approaches of Spector and Gordy in the 1960s, not to mention the legion of producers who have continued to mix and master for automotive stereo systems and other everyday listening contexts.[37] Studio equipment manufacturers have themselves gotten into the game, marketing products to producers that offer, as in the case of Avantone MixCubes, "the ability to hear what your mixes will sound like on bass-challenged real-world systems such as computers, televisions, car stereos, and iPod docking stations." Such products acknowledge in their pitch that listening

contexts in the "real world" are far from the ideal audio environments in many studios: "Mini reference monitors, like the MixCubes, give you an idea of what your mix will sound like in real-world listening situations—like stock TV and computer speakers, and basic car stereos, and earbuds. If you want to create a professional-sounding mix that will translate everywhere, you've got to give it the real-world test."[38]

Of course, while some producers have actively mixed their music for MP3 players, MySpace, and mobile phones, others eschew altogether any attempt to tailor—never mind distort—their productions to meet current expectations or for inferior media. In the notes for a recent release, for example, Robert Henke, aka electronic producer Monolake, makes explicit that: "The music on this album has not been compressed, limited or maximized at any production stage." Henke's explanation for his decision to depart from convention blames trebly technologies, old and new, for destroying any room for dynamics, and he is rather frank about the limitations of cellphones as listening devices—shortcomings that, at least for this particular project, would not suit the detailed textures of his music:

> Radio, and more recently mp3 players and laptop speakers influenced the way popular music is composed, produced and mastered: Every single event has to be at maximum level all the time. This works best with music that is sonically simple, and music in which only a few elements are interacting. A symphony does not sound convincing thru a mobile phone speaker, and a maximized symphony does not sound convincing at all.[39]

Going a step further, producer Stephen Street, who has worked with such popular rock groups as the Smiths and Blur, dismisses mobile music players altogether: "I'd hate to think that anything I'd slaved over in the studio is only going to be listened to on a bloody iPod" (Spence 2009). This sense of disgust and dismay, no doubt echoed in high-end studios around the world, recalls *Stereophile* editor John Atkinson's lament that the days of high fidelity are over, but although it seems unlikely that one would inspired by today's treble culture to assemble a costly hi-fi, people's desire to hear the latest and greatest, wherever they may be, has hardly diminished. And so these very "deficiencies" in contemporary audio culture have led producers, as always, to seek new ways of optimizing musical effects for popular playback technologies.

Beyond the tricks of mastering a mixed-down track, we can point to a number of ascendant sonic qualities or representational techniques in today's treble culture—the stuff of "blog house," bassline, and grime, to name a few. Because such genres largely circulate and are played through laptop computers, MP3 players, and cellphones, their very aesthetics are bound up with the sounds of low bitrate compression and ringtone-like (if not ringtone-derived) bloops and bleeps—that is, sounds which, like ringtones themselves, are able to cut through the din of public life. Take, for example, the following passage from Dan Hancox's blog post about sodcasting and note in particular how Hancox names a variety of technologies—from filesharing software Limewire to mobile phones—and the way their traces seem to issue from the crunchy timbres and

impoverished (bass) frequencies of the music itself, qualities which have come to periodize these recordings for the author and his cohorts:

> While road-rap may hold sway on the buses now, it's grime which has the best fit for the context—clear in grime's low-bitrate, badly-mastered early incarnations, which carried that rawness and DIY energy of punk, as Alex Bok Bok and I argued in [a previous] post:
>
> > *Tracks like the insane, taut Ruff Sqwad anthem R U Double F—one of the few vocal tracks we've included [in the mix]—is a 64kbps, straight-off-Limewire, never-released work of genius. It's an mp3 dubplate, and the grooves have been battered into submission by repeated compression: we've included many low-bitrate tracks in this mix, because for us fucked-up sounding mp3s were a massive part of listening to music from this era.*
>
> Grime suits mobile phone speaker technology, or lack thereof, perfectly. The glorification of treble culture in grime reached a peak of forthrightness with the Slix Riddim 'No Bass', rinsed by the likes of Ruff Sqwad, Bossman, and scores of mobile phone DJs throughout 2005/6.[40]

Although bass may seem largely absent from such tracks, at least as heard through a cellphone or laptop, one interesting development across some of the genres named earlier is the use of particular synthesizer shapes that seem well poised for trebly playback, as well as, sometimes in conjunction with such standout waveforms, the transposition of bass lines into higher octaves, often doubling the bass melody in a more audible, reproducible range. Both sonic strategies emerged as hallmarks of the (sub)genre known as bassline (or bassline house), an offshoot of UK house and garage initially based in Sheffield. Commenting on an article about bassline by Mark Fisher (2008a), author Dominic Fox zeroes in on these techniques while tying them to the well-noted phenomenon of young people playing music on buses, recalling the discussion in the first part of this chapter:

> Couple of things I've noticed:
>
> i) Use of filtered square waves in the bass lines. These sound dated, 8-bit, BBC-micro-ish, but also (because of the filter envelope, which gives it a sort of duck-like quack) round and phat. They also transpose well out of the normal bass range into higher tones—you hear synth melodies that are basically bass figures pitched up an octave or two. I haven't listened to enough stuff closely enough to tell whether bits of tune migrate between bass and melody in the same song, but it wouldn't surprise me.
>
> ii) In spite of the bass-heaviness of it, it's also clearly designed to sound good coming out of tinny little portable mp3 player speakers. This is in fact how I've heard nearly all the bassline house I've heard over the past month (that and the occasional visit to 1Xtra): teenagers in the bus station crowded round someone's phone or player listening to the stuff. It's like the return of the portable transistor radio (with similar connotations of public nuisance—I've seen kids get kicked off buses for playing their music too loud), and a complete breakout from the iPhone personal-music-space

> mentality. It turns out that peer-to-peer file copying isn't the only way people like to share music, after all.[41]

And, indeed, one of the more well-known producers working in the bassline genre, Dexplicit, seems to confirm this frequency drift at the stage of production, though his observations remains rather conjectural: "A lot of producers nowadays are building their tunes around a strong synth riff, as opposed to a distinctive bassline being the integral part of the song. Maybe this is a result of their audiences becoming more accustomed to mid-range music via their iPods? Or maybe they are just toning down the bass to get more radio airplay?" (Hancox 2010).

Critic Simon Reynolds also tries to connect this overriding aesthetic quality to contemporary listening practices, hearing in bassline—and in "blog house," a somewhat jokey umbrella term including the French acts to which he alludes—a kind of "flat" quality that seems tailor-made for plastic laptops: "Bassline seems much more in your face and to my ears has something of the 'flat' sound I associate with Justice and all those French disko-roque type outfits (which really leap out at you through computer speakers but I can only imagine is supremely grating through a big system)."[42] Further, this connection between production aesthetics in the 00s and computers as primary listening stations echoes in the words of sound engineer Dan D'Errico, for whom a recent album by London-based producer Zomby seemed to sound better when listened to via "inferior" equipment: "I can't help but feel that it plays better through the speakers on my laptop than through my nice studio monitors. It has a lot more life to it when listened to that way. It takes on less of the uber-compressed sound and opens up a bit more."[43]

Among other aesthetic phenomena connected to today's trebly zeitgeist is the trans-genre style that has come to be called "wonky" (after an influential article by critic Martin Clark, who also produces under the name Blackdown).[44] "[T]he mid-range is being hijacked by off-kilter, unstable synths," wrote Clark in April 2008, "[c]rossing hip-hop, hyphy, grime, chip tunes, dubstep, crunk, and electro." An era in which bass is hardly heard outside club contexts has given rise, to Clark's ears, to a great deal of "music that uses the middle interestingly."[45] This approach includes the doubling or transposition of bass lines into mid-range registers in bassline house, but it goes further: not content simply to represent bass lines in more audible ranges, producers embracing the "wonky" aesthetic—many of whom, it should be noted, also infuse their tracks with plenty of bass—have zeroed in on the mid-range as the primary register of sonic salience. Although Clark was skeptical when I asked him about the relationship between contemporary listening technologies and the wonky aesthetic, he did offer that "the MP3 is definitely to blame to an extent" and affirmed that, for young people in particular, and especially those without access to expensive and powerful audio equipment, "mobiles are the new boomboxes—except with defacto hi pass filters."[46] Steve Goodman / Kode9, on the other hand, who has himself produced and released some "wonky" music, more readily recognized a kind of "feedback from a youth culture used to hearing their music as purely in the mid-range of frequencies," pointing in particular to "the

brittle production of grime," though he was quick to add that grime is "still a very bass heavy music"—an important reminder that bass culture perhaps paradoxically sustains itself as such even when the music is, in many cases, experienced as bassless.[47]

Whether or not we can posit a causal connection between MP3s, mobile devices, and the emergence of wonky and other styles that exploit mid-range frequencies, it is clear that this constellation nevertheless animates a great deal of discourse (especially of the hand-wringing sort) around the effects of treble culture on bass culture. Take, for instance, a comment from a Jamaican observer bemoaning the trebly turn in reggae, bass music *par excellence*:

> We've been having this debate a lot recently in Jamaica—bass is gone from dancehall and even so-called "one drop" riddims are more about the guitar motif than a heavy bass line. A lot of people are saying this is a big reason behind the drop-off in dancehall popularity outside of Jamaica and the diaspora—it's no fun to dance to anymore. . . .
>
> Most of the young and new producers are at home mixing their stuff on computer speakers or maybe a pair of low-end 6" Roland or M-Audio speakers at best. There's no mastering, no one's going to Mixing Lab or Arrows or wherever to have a real engineer give it the magic touch. The production chain in Jamaica is now Fruity Loops/Acid/Reason/Nuendo > mp3 > MySpace/Facebook/email all your friends (and not even a good mp3 encoding).[48]

Note the attention to the software-dominated "production chain" and how it affects sound—not to mention the connection drawn between bass and dancing, to which we will return in a moment. And yet, on the other hand, we would be remiss to overlook the other side of the aesthetic coin: in an era of treble culture, treble-centric genres have thrived. Perhaps the best example is regional Mexican music, an estimated 85% of which—in terms of digital sales—is now purchased and listened to on cellphones (Kun 2009). As Josh Kun recounts in a recent article for the *New York Times*, regional Mexican artists have found remarkable success reaching audiences via the mobile market, and although this has as much to do with the mobility of the audience itself and the ease of access cellphones offer (as opposed to the expense of home computers and broadband connections), Kun also noted via personal correspondence, that Mexican regional music was treble-centric prior to today's treble culture and hence the lack of bass presents no impediments to its popularity (not that there is any evidence that hip-hop, reggae, or other bass-centric genres have suffered in this regard, at least in terms of soundscape presence).

In contrast to the easy marriage between treble-inclined genres and mobile technologies, the particular and sometimes painful ironies of filtering bass culture through treble culture clearly produce anxieties among certain practitioners and stakeholders. The concern is not simply that attenuated bass leads to impoverished musical experience, strictly sonically speaking; rather, the lack of bass in contemporary audio culture, for some, opens into other kinds of loss. In such discourse, we behold how aesthetics pertain not simply to issues of form and content but also to the phenomenological, even ontological, effects of music and sound. For certain critical observers, less bass means

less dancing, less embodiment, less profundity. Don Letts, a British musician and filmmaker of Jamaican parentage, recently expressed some acute worry about how contemporary technologies—once again, figuring young people on buses—are "ruining" bass culture, with serious implications for, among other things, gender balance among audiences. "It's disturbing when I see kids on buses, listening to music on their phones, and it's just going: tsk, tsk, tsk, tsk, with no bass," Letts told *The Guardian*, "Bass culture is Jamaica's gift to the world and technology is, kind of, ruining that. Bass is sexy. Women respond to bass" (*The Guardian* 2009). Regardless of whether this strikes some as sexist or paternalistic, Letts's sentiments echo elsewhere. Returning to the Jamaican commenter on my blog quoted earlier, we get a similar sense that today's bass paucity, increasingly built into actual productions themselves as opposed to simply filtered out via lossy tech, has direct connections to the ways music engenders movement, especially inter-gender dance: "There is no more rub-a-dub in actual dances here—daggering is the only male-female contact, and that's not a bass-induced movement (unless you count the fact that have to climb up on top of the subs to leap off of to do it)."[49]

Sometimes this sense of loss and anxiety about treble culture registers as an incompleteness to the music in question, or to musical experience itself. In an article for *Fact Magazine*, British critic and theorist Mark Fisher (aka K-Punk) discusses the club context as a privileged, but also crucial, place for accessing the special sense of spatiality that certain music, especially genres nodding to or influenced by dub reggae, can create. "Both dubstep and minimal techno only achieve their full potency," he argues, "when played on a club soundsystem. The subtle pressure of sub-bass, the way it moves the very air itself, the hypnotic pulse of the drums, not to mention the role of the dancing crowd itself: none of this can be replicated at home, still less on iPod headphones" (2008b). Beyond a certain phenomenological lack, the absence of such "potency" and "subtle pressure" can have profound ontological implications, not least of which being a certain forgetfulness about how our bodies themselves are objects on which music operates. Steve Goodman takes this idea to a somewhat far-out, if intriguing, extreme:

> What gets lost is a certain sensual relation between the dancer and their body, the sense of the materiality of their bodies, that they are just another vibrating object in the room. What I think is conceptually powerful about bass culture is that it reminds the arrogant human race that they are really mostly composed of non-organic matter, are not self-enclosed individuals but permeable membranes through which forcefields can pass and interfere with your insides. I think there is an extent to which bass culture educates dancers about their bodies, literally vibrating parts they didn't know they had.[50]

Notably, Goodman is not so much concerned with bass poverty in mobile listening contexts but rather with the unavailability of sub-bass frequencies even in music venues that theoretically have the power to project them.[51] His position, however, stands in contrast to other expressions of dismay about the aesthetic effects of treble culture on a generation of habituated youth. "How wretched would a world without bass be," asked one commenter on Dan Hancox's post about sodcasting, adding, "I can't get excited that a generation are becoming used to listening to music like this."[52] But, from

another perspective, to worry so much about treble culture is not only paternalistic and, as I hope I have demonstrated, historically short-sighted, it may also be premature—not to mention utterly projected (that is, uninformed by ethnographic evidence).[53]

On the contrary, the aesthetics of treble culture may well include, if not impel, a certain kind of active listening—an engagement with music that is far from impoverished, at least with regard to imagination and even embodiment. Replying to the commenter who asked, in fairly typical fashion for detractors, "isn't it nice to actually be able to hear all the different parts of the track going on at a decent level of sound quality rather than it sounding like it was recorded in a pair of socks?" another contributor to the same forum offers: "A kid listening to the same tune the next day on the bus is more than likely aware that it sounds like tosh, but is probably thinking about how awesome it sounded the night before!"[54] Indeed, affirming this contention, a handful of commenters on my own posts about treble culture insisted that they imagine bass—or remember it, which is a kind of imagining—even when it is not audible.[55] They sway and shake as they might otherwise, an imagined embodiment of bass (which becomes a sort of "real" embodiment as soon as one moves). They "hear" lines that are not actually present. In other words, they reserve some psychoacoustic space for the missing bass. Or, it is not only the MP3 which plays the listener, we listeners also play ourselves. Riffing on this idea of intentional—as opposed to automatic—psychoacoustic labor, one commenter at my blog, a hip-hop producer named Canyon Cody, argued that listening in digital treble culture is, therefore, actually a creative act, a form of participatory culture even: "In contrast to analog listening, we are always imagining sounds to fill the space in all digital music—an unconscious blurring of the interstitial space between bits—but I think there's a higher level of agency in our participation with treble culture."[56]

Conclusion: Sonic Culture in Transition, Public Culture Too?

For all the optimism if not outright utopianism that pervades discussions of digital technologies, dissenting voices offer some temperament as we charge forward into the brave new world of mobile culture. British cultural historian Paul Gilroy, for one, is wary about how such new technologies (as well as their analog predecessors) impose a layer of mediation that bypasses the powerful, face-to-face, real-time musical encounters that he likes to think of as the "electric church." Speaking specifically to the experiences of black Britons in the 1970s and 80s, and emphasizing the importance of "bass culture" to an oppositional epistemology, he argues:

> Musical culture and the elaborate social relations that eddied around it, at least until the digital revolution changed the game, created that locus [of healing and autonomy] and invested it with a precious democratic energy in which audiences and performers could interact and collaborate.... First pirate radio then the anti-social

> cultures of mobile privatization replaced the ancient authority of the electric church with something shallower and more consumer-friendly. . . . That world of sound celebrated here was specified hesitantly but repeatedly in the same vernacular code as something like a 'bass culture.' It was shaped by a fundamental awareness that as far as understanding the predicament of these sufferers was concerned, vision was not the master sense and words alone could not be a stable or trustworthy medium of expression and communication. (2003:388–89)

In the paragraph that follows, however, Gilroy registers some ambivalence about the fact that the image of black Britons he romanticizes may well be one of people standing in front of a DJ and a stack of speakers. And yet he also notes that there are important redemptive and connective possibilities embodied by the mobility of recorded sound:

> The preference for recorded rather than live performance was an interesting and disturbing feature of the soundscape of the period, which did not reveal an absolute enthusiasm for music made and heard in real time. The aesthetic and anti-aesthetic codes that governed this economy of pleasure, escape, transcendence, and desire specified instead that the highest value was to be placed on and invested in art that spoke to the immediate circumstances in which it appeared but relied upon processes of intermixture and combination that made elsewhere audible. (389)

Clearly, the contested sociality of public sound reproduction remains at the heart of the debate over both mobile culture and treble culture. But couldn't perhaps today's noisy (and often black) "kids on buses," as well as their interlocutors and opponents, constitute another kind of interactive, collaborative listening public? Other, more celebratory narratives of pirate radio and mobile music in London push against this interpretation, arguing for their constitutive role in creating and maintaining community.[57] Is mobile, treble culture a matter of privatization, or publicization? Are new audiences, listening publics, public spheres even, capable of being engendered by mobile culture in a manner that once again holds some promise of "a precious democratic energy," of debates and discussions and of collective expressive and interpretive practices? Why should we privilege the mobile sound systems of the mid-to-late twentieth century over the mobile sound systems of the twenty-first? Is it just a matter of missing bass? Or are certain critics, so to speak, missing the bus?

Although a marked concern with the loss of high fidelity—and in particular, a paucity of bass—permeates the discourse around today's treble culture, conjuring specters of ontological and phenomenological poverty, even the bass boosters of the world can hear potential—the opening of new social, cultural, and political possibilities—in sound's newfound portability. While these possibilities may remain to be seen or heard or realized, attending to treble culture without the blinders of bass fetishism might prove a more productive strategy. Steve Goodman—a dedicated futurist, hence hesitant to rope off possible scenarios through critical foreclosure—offers an important reminder that focusing on frequencies, as much as that may reveal about our aesthetic and cultural priorities, can risk missing the forest for the tress:

> I think something much more interesting is going on with kids using mobile phone speakers as mobile sound systems. The potentials of young people carrying sound

> reproduction (and increasingly production) devices around with them at all times is more significant than the fact that they are trebly. The becoming trebly of mobile culture is perhaps part of the cost of sound's ubiquity—bass is heavy—i.e., it's not so portable. I think that sonic culture is in transition right now, and this kind of ubiquity is going somewhere quite unpredictable and I don't think you get half of that picture by just complaining about lack of bass, as much as I do generally complain about that.[58]

By hearing today's treble culture in the *longue durée* of sound reproduction provided by Jonathan Sterne, Greg Milner, et al.—that is, in the historical context explored in the middle section of this chapter—we can appreciate, on the one hand, how well today's technologies and practices fit into an overarching dynamic whereby engineers and producers have increased sound's portability alongside innovations in sonic definition and "fidelity" (to what, of course, is another question in an era of synthesized and sampled music made on computers). On the other hand, as Goodman's attention to the "unpredictable" qualities of today's sonic culture implies, there does seem to be something genuinely new and unprecedented in the contemporary portability and ubiquity of sound reproduction technologies. Not everyone carried around a transistor radio, despite their popularity, but it is becoming increasingly difficult to find people without cellphones, even in the underdeveloped world or among the disadvantaged in rich countries. (Indeed, across both of the latter populations, access to mobile phones is remarkably widespread and steadily on the increase.[59]) As mobile devices, especially phones, make sound reproduction—however trebly—more commonplace and perhaps more social than ever before (hotly contested as that sociality or sociability may be), we can only wonder about, as we try to take stock of, the effects on listening as a private and a (counter?) public activity, not to mention the implications thereof (Warner 2002).

Imagining unheard bass calls attention to the active possibilities in treble culture. And indeed, as perhaps my own narrative offers, a lot of the dyads through which the public debate plays out—active versus passive, progressive versus regressive, public versus private, sociable versus individualistic—might be easily enough flipped depending on one's perspective. This reconcilability suggests that treble culture, especially in its contemporary form, offers what writer and artist Jace Clayton (aka DJ /Rupture) calls a "strategy for intimacy with the digital" (2009). In the ongoing dance between people and technology, treble culture opens a space where imaginary bass can move us as much as tinny blasts of noise. As participants in today's treble culture attest, the MP3 may play its listener, but people imagine a lot more than missing bits when they listen. Ironically, the techno-historical convergence that Gilroy mourns, in which "community and solidarity, momentarily constituted in the very process, in the act of interpretation itself" (2003:388)—a lament which issues also from the anxious discourse around today's treble culture—may yet find some resuscitation thanks to trebly audio technologies. For what do such acts of interpretation require if not listening together? And isn't listening, perhaps more now and more collectively and publicly than ever, what treble culture is all about?

Notes

1. Posted to a message board at *Drowned in Sound*, a UK-based music webzine with an active discussion forum. The particular conversation thread was titled "Is sound quality really important any more?" and can be found here: http://drownedinsound.com/community/boards/music/4201236# (accessed January 4, 2010).
2. London-based Jamaican artist and critic Linton Kwesi Johnson popularized the term "bass culture" on a 1980 album of politically charged spoken word reggae, or dub poetry. It later served as the title for a popular history of reggae by Lloyd Bradley, *Bass Culture: When Reggae Was King*, published in the United States as *This Is Reggae Music: The Story of Jamaica's Music*. According to legions of reggae diasporists—or, depending who you ask, imperialists—reggae's worldwide spread and its formative influence on popular dance music from hip-hop to house, drum'n'bass to dubstep, means that bass culture has truly "gone global" (to employ a catch phrase from advertising and reggae alike). Insofar as Jamaican style sound systems are now an international staple, never mind how reggae aesthetics—with particular regard to the role of bass—have informed the production of modern pop (see, e.g., Veal 2007:220–48), claims to a more widespread bass culture than ever before would seem to have some merit.
3. To be clear, when discussing "treble" or "tinniness" in this chapter, I am generally referring to frequencies between 6 and 20 kHz, whereas "bass" indexes the frequencies on the lower end of the audible spectrum (e.g., 20–250 Hz, including what is known as "sub bass"). The actual frequency ranges for the bass or treble registers might differ depending on how much "mid" or "upper" bass one wishes to include in the low end, or conversely, how much "upper midrange" in the high end.
4. Take, for example, a recent interview with London-based producer Mark Lawrence (aka Mala), who works mostly in dubstep, a genre deeply informed by reggae's predilection for bass. Recounting a series of music workshops he offered, Mala shuddered to think about the aesthetic feedback loop produced by the rise of mobile phones as primary listening devices: "Most of the youngsters were listening to music mostly on their mobile phones. So you have to think that you have producers trying to recreate music and music's made for this bandwidth and they only understand music sonically on that bandwidth. So actually *this whole culture* of compressed files and bad sound quality, is, to some extent having a knock on effect" (Franco 2010: n.p., emphasis mine).
5. Guillaume Decouflet, email message to author, September 3, 2009. Decouflet is a DJ and blogger by way of France/Canada.
6. http://www.urbandictionary.com/define.php?term=Sodcasting# (accessed January 4, 2010).
7. Although teens appear to be the figures most often fingered in treble culture discussions, I do not mean to imply that adults and children are not also active, noisy participants. See, for instance, Tyler Bickford's chapter in *The Oxford Handbook of Mobile Music Studies, Volume 1*, "Earbuds Are Good for Sharing," for an account of how kids in primary school are engaging in treble culture by using maxed-out earbuds as miniature speakers, among other practices. Moreover, writing for *The Guardian*, Dan Hancox observes that the practice is not so easily consigned to a particular age-group: "On London buses, I've seen middle-aged gay couples playing South American pop on a wet Saturday afternoon, moody raver mums sodcasting acid house from their glory years; it's not just the preserve of teenagers with attitude problems" (2010).

8. http://twitter.com/laurent_fintoni/status/3689580497 (accessed January 4, 2010). Allow me to offer my thanks here to Laurent and to all the other helpful interlocutors who responded to my queries on Twitter and my blog. These contributors—my collaborators, really—are too numerous to mention here, but I want to express my deep gratitude for all the feedback this project has received. Researching treble culture with the help of online social networks has proven, if I may, to be the most successful bit of "crowdsourced" scholarship I've had the pleasure to co-produce.
9. Grime is a genre that emerged in London just after the turn of the millennium, drawing together influences from UK garage and other club music, hip-hop, and dancehall reggae, with a marked aesthetic preference for sounds recalling video games and cellphones.
10. The appearance of the article in *Wired* magazine, known for its optimistic take on technology matters, is perhaps one explanation for its celebratory rather than critical tone.
11. The following blog post served as a call, and it returned a large number of anecdotes and opinions, which I imagine will continue to trickle in: http://wayneandwax.com/?p=2332 (accessed January 4, 2010).
12. Alex Helsinger, email message to author, October 29, 2009. Helsinger has long worked in the media industry (in particular, with musical meta-data); when we corresponded, he was living in Bamako while his partner, a graduate student in anthropology, conducted field research for her dissertation. Ethnomusicologist Ingrid Monson, who has been doing research in Mali for several years, told me after presenting this chapter as a work in progress that the phenomenon is really quite new, noting that such phones were nowhere to be seen or heard as late as 2007.
13. Carolina Gonzalez, email message to author, June 17, 2008. Gonzalez is a longtime music and culture writer, blogger, and, in her words, "cultural studies academic." Of course, there is a slight difference between a trebly device (one that doesn't have the capacity to reproduce certain frequencies) and the apprehension of sonic "emanations" that sound trebly. In the case of Carolina's subway example, trebliness is not a product of the frequency response of headphones but is more an effect based on a differential relationship to the sound source. Nevertheless, such incidental broadcasts obviously enter into public perceptions of and debates around mobile music and "treble culture."
14. http://wayneandwax.com/?p=2332#comment-10796 (accessed January 4, 2010).
15. Andrew Clarkwest, email message to author, September 4, 2009. Clarkwest is a Harvard trained sociologist now working outside academia.
16. See, for example, "frederic tecktonic," a brief video in which a young man dances outdoors to a beat seemingly provided by a rather trebly device: http://www.youtube.com/watch?v=8Ot—qcl3aM (accessed January 4, 2010). It is worth noting, as well, that the trebly quality of a great many YouTube videos also arises from recording devices (especially cellphones, small cameras, and other everyday mobile technologies) that simply cannot capture large frequency ranges. This effect seems to be a critical part of the attenuated sonic culture of a wide swath of YouTube videos, particularly live recordings made with consumer-grade devices.
17. In a study of mobile phone practices, and in particular the use of ringtones, Licoppe contrasts "intimists" ("mostly women"), who seek to minimize "public exposure of personal features," with "expressive youth," who use their mobile phones "as a way to assert and make public various identity claims." For Licoppe, musical ringtones constitute "a resource for distinguishing oneself by making one's tastes visible in the public sphere, usually in relation with some form of collective and recognizable identity claim, either with respect to an

actual peer group (friends) or an imaginary one (everyone who likes a particular type of music)" (2008:146–47).

18. See *Enfield Independent* 2006. Thanks to Dan Hancox for this reference, as mentioned in his interesting and helpful blog post on "sodcasting": http://dan-hancox.blogspot.com/2009/10/on-buses-sodcasting-and-mobile-music.html (accessed January 4, 2010).
19. http://drownedinsound.com/community/boards/music/4201236#r4919350 (accessed January 4, 2010).
20. http://drownedinsound.com/community/boards/music/4201236#r4919401 (accessed January 4, 2010).
21. Again, Hancox's blog post can be accessed here: http://dan-hancox.blogspot.com/2009/10/on-buses-sodcasting-and-mobile-music.html; see http://news.bbc.co.uk/1/hi/entertainment/8309690.stm for the article describing a kind of racial profiling on the part of the Metropolitan Police.
22. Hatherley's "In (Partial) Defence of 'Sodcasting' " can be accessed here: http://nastybrutalistandshort.blogspot.com/2008/02/in-partial-defence-of-sodcasting.html (emphasis in original, accessed January 4, 2010).
23. http://dan-hancox.blogspot.com/2009/10/on-buses-sodcasting-and-mobile-music.html?showComment=1256826252856#c6495460244025346915; see also, a series of related tweets from Copsey, recounting bad bus experiences ("conversations in our flat post-incidents") to confront Hancox's assertions about treble culture and community: "nastiest involved man threatening woman 'i'll cut out your eyes' " (http://twitter.com/tancopsey/status/5235651020); "when asked to turn off crap tinny music. he moved behind her and kept up threats. community destroyed at these moments." (http://twitter.com/tancopsey/status/5235695791).
24. http://wayneandwax.com/?p=2332#comment-11055 (accessed January 4, 2010).
25. See Stephen Connor's article, "Edison's Teeth" (2004), for a theoretical consideration of the inventor's belief in his superior sense of "hearing" resulting from his "wonderfully sensitive inner ear" receiving sounds and overtones far more accurately via his teeth and jawbones than from "normal ears."
26. Moreover, with regard to bass we should add that, according to Gronow and Saunio, "The secret of the Motown bass sound was that the label's studio was the first to record the electric bass directly from the pick-up of the instrument without a separate microphone" (1998:160).
27. I don't have the space to explore it here, and the extant literature seems lacking, but the connections between popular playback technologies and production aesthetics would—despite being driven by US-based music industry—no doubt emerge more clearly in comparative, global perspective. Nilanjana Bhattacharjya notes, for instance, that "Indian lo-fi cassette recorders and radios favor the treble, so for a long time (and arguably still) many music producers master their recordings toward that end." Email message to author, September 14, 2009.
28. For more on the "loudness war," see Milner's chapter 7 (2009:237–92) or any number of articles that have been published on the subject (e.g., Southall 2006; Levine 2007).
29. I qualify this sentence because it is likely that before long we will witness a swing in the other direction as lossless compression schemes, cheaper storage, and greater broadband access make it possible for music to remain portable without affecting audio quality as much. Or as mastering engineer Jonathan Wyner puts it, recognizing the difference between the

high fidelity world and that of "standard practice": "We'll be able to store CD-quality files, transmit them across the next-generation Internet, and see higher fidelity creep into standard practice" (Anderman 2007). Moreover, it is important to remember that some of the most bass-ful experiences of the twentieth century were provided by mobile equipment, whether Jamaican sound systems, Colombian picós, Brazilian trios elétricos, or Trinidadian tractor trailers.

30. For those who prize sonic definition above all, we could identify a host of issues of concern. And yet, while the following innovations served to increase or decrease sonic definition, they did not tend to affect the audibility of treble over bass, per se. Nevertheless, certain listeners locate a loss of "depth" or "presence" in the transition, around 1970, from vacuum tube powered recorders to those that relied on solid-state transistors, as well as in the shift from sixteen to twenty-four track consoles—a decrease in bandwidth that led to the loss of certain "transients" or "the very high and low frequencies that," at least for certain engineers and audiophilic ears, "fleshed out the sound" (Milner 2009:160–61)—a complaint eerily echoed in discussion of MP3s. Along these lines, in the 1980s audiophiles complained about crude early CD standards (44.1 kHz) as well as early AAD transfers to CD—that is, recorded and mixed in analog, transferred to digital—which often did not account for the (analog-era) bass boost in record-player pre-amps discussed earlier. Given a concern with such sonic minutiae, hi-fi's defenders might take heart in a movement away from portability as an overriding ideal, at least among some listeners. "Bad sound on an iPod has had an impact on a lot of people going back to vinyl," fifteen-year-old high school sophomore David MacRunnel recently told a reporter from *Time* (Dell 2008). Then again, a good number of MacRunnel's 1000-plus LPs were likely to have been recorded, mixed, and mastered with digital technology.
31. The newsletter is excerpted and reprinted at http://he-japu.blogspot.com/2005/06/meta-audiophile-recordings-and-sacddvd.html; see also, Atkinson (1999).
32. Steve Goodman, email message to author, September 17, 2009. I published excerpts of this email exchange to my blog (http://wayneandwax.com/?p=2365), where it generated further discussion.
33. In a paper prepared for the 2009 Audio Engineering Society Convention, Pras et al. found that test subjects "significantly preferred CD quality to mp3 files up to 192 kb/s for all musical genres" (2009:1), although it is remarkable—and, in my opinion, regrettable—that the genres in question ("Pop," "Metal Rock," "Contemporary," "Orchestra," and "Opera") did not include any drawn from bass culture or electronic dance music. Because "high frequency artifacts were the most selected criterion" by test subjects discerning a difference in audio quality, the researchers conclude that "mp3 compression introduces audible artifacts, and that listeners' sensitivity to these artifacts varies as a function of musical genre and listeners' expertise" (6). The researchers acknowledge, if perhaps somewhat dismissively, Stanford professor Jonathan Berger's study (see, e.g., Spence 2009), one of the more widely cited in the press and the genesis of "sizzle" as a distinctive and preferred timbral quality of MP3s, as "an informal study where young listeners preferred compressed formats to CD quality" (7).
34. It is interesting that commonplace adjectives such as "tinny," referring to metal rather than plastic, locate the discourse around treble culture in outmoded but obviously still resonant technological terms, affirming again a continuity across the various trebly moments in the history of recorded sound.
35. Michael Bell Smith, direct message to author via Twitter, September 1, 2009: "I've heard anecdotes of young bands wanting engineers to mix/master songs so they sound more like 'myspace'–LBR [low bitrate] aesthetics."

36. Steve Goodman, email message to author, September 17, 2009. Of course, it is worth noting that hot mastering can also offer a "semblance of low end" on "mediocre sound systems" (Milner 2009:248) because of the simple but profound fact that, listened to loud, more low frequencies are audible. So, ironically, even as compression in the age of "loudness wars" decreases dynamic range, favoring the more easily audible, higher frequencies, it can also boost a sense of bass.
37. Along these lines, I witnessed a recording engineer at a Jamaican studio in 2004 mixing back and forth between large studio monitors and a small radio, making sure that, as he put it, "the man on the street" would also hear the bass.
38. http://www.sweetwater.com/store/detail/MixCubesAct/ (accessed January 4, 2010). Thanks to Jesse Kriss for bringing this to my attention.
39. http://www.monolake.de/releases/ml-025.html (accessed January 4, 2010).
40. http://dan-hancox.blogspot.com/2009/10/on-buses-sodcasting-and-mobile-music.html (accessed January 4, 2010); the previous post to which this quotation refers, a description of a DJ mix featuring lots of low bitrate grime tracks, can be found here: http://dot-alt.blogspot.com/2002/10/blogariddims.html (accessed January 4, 2010).
41. http://k-punk.abstractdynamics.org/archives/010014.html (accessed January 4, 2010).
42. http://blissout.blogspot.com/2007/11/emerging-from-miasma-of-work-excursion.html (accessed January 4, 2010).
43. http://wayneandwax.com/?p=2365#comment-11260 (accessed January 4, 2010).
44. http://pitchfork.com/features/grime-dubstep/6840-grime-dubstep/ (accessed October 10, 2011); for further thoughts on timbre, texture, and melody in "wonky," see http://rougesfoam.blogspot.com/2009/06/loving-wonky.html (accessed January 4, 2010).
45. Martin Clark, email message to author, May 1, 2008.
46. Ibid.
47. Steve Goodman, email message to author, September 17, 2010.
48. http://wayneandwax.com/?p=2365#comment-11249 (accessed January 4, 2010).
49. http://wayneandwax.com/?p=2365#comment-11249 (accessed January 4, 2010). "Rub-a-dub" is a well-worn Jamaican term for close partner dancing, whereas "daggering" describes a recent dance trend that could be described as a kind of cartoonish sexual pantomime in overdrive.
50. Steve Goodman, email message to author, September 17, 2010.
51. "My problem is not with tinny playback devices in situations where there traditionally there was never much bass playback. My problem is more with the squeezing out of bass in music performance venues/clubs/festivals, etc." (ibid.).
52. http://dan-hancox.blogspot.com/2009/10/on-buses-sodcasting-and-mobile-music.html?showComment=1258642671936#c5348073059544751240 (accessed January 4, 2010).
53. I say "premature" because, given the way technology tends to work, it is quite possible, probable even, that cellphone and laptop speakers will get better and bassier, within physical limitations of size, of course. Regarding ethnography, I regret that beyond my readership on Twitter and at wayneandwax.com, I did not have an opportunity to talk with more young people immersed in public treble culture. It is certainly an important place for further research, and the work of Tyler Bickford (see, for instance, chapter 15 in Volume 1 of *The Oxford Handbook of Mobile Music Studies*), among others, will help to flesh out the phenomenological implications of today's treble culture. It is all too telling that the concerns over "kids these days" and their trebly music are primarily voiced by older observers.

54. http://drownedinsound.com/community/boards/music/4201236# (accessed January 4, 2010).
55. Thanks to Michael Heller for reminding me that Robert Walser notes a parallel listening practice in his study of heavy metal, wherein listeners imagine the music not with greater bass presence but with high volume: "Even when it is heard from a distance, or even sung softly to oneself, metal is imagined as loud, for volume is an important contributor to the heaviness of heavy metal" (1993:45).
56. http://wayneandwax.com/?p=2352#comment-11095 (accessed January 4, 2010).
57. Again, see the blog posts on "sodcasting" by Dan Hancox and Owen Hatherle: http://nastybrutalistandshort.blogspot.com/2008/02/in-partial-defence-of-sodcasting.html; http://dan-hancox.blogspot.com/2009/10/on-buses-sodcasting-and-mobile-music.html (accessed January 4, 2010). See also, Hancox's follow-up article in *The Guardian* (2010).
58. Steve Goodman, email message to author, September 17, 2009.
59. Among other indicators, see, e.g., the following articles: *CBC News* (2009); Arnquist (2009); Bellman (2009); Contreras (2009).

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