Tracing Digital Footsteps: A New Zealand Musician in the Internet Age
JD Stout Lecture 2023[1]

MICHAEL BROWN

Abstract
Since becoming widely accessible in the 1990s, the Internet has had a profound impact on creative fields such as music. The experiences of New Zealand musician Luke Rowell (a.k.a. Disasteradio, Eyeliner) provide an illuminating case study of these changes. First dialling-up in 1998, his online activity and creative development are intertwined in a career spanning several epochs of Internet history. This article explores these connections and the task of tracing an artist's digital footsteps using web archives and other sources. It focuses on three periods: Rowell's involvement with the European demoscene (1999-2002); becoming part of the online vaporwave movement (2011-2013), and contemporary online music distribution (2023).

Introduction

If you are ever on Bunny Street in downtown Lower Hutt, your eyes may be drawn to a broken sign on the side of a building with its sole remaining word: "Email." The sign is a remnant of an Internet café that operated there from around 2002 to 2015.[2] Internet cafés, lest we forget, were establishments offering computer Internet access, printing, scanning, and other services. Several were operating in Auckland by the mid-1990s.[3] Many others sprang up in towns and cities across the country, some becoming social hangouts, especially for playing computer games. Most are now gone.

Figure 1: Former site of Internet café, Bunny Street, Lower Hutt, February 2022. Photograph by Michael Brown.

Journal of New Zealand Studies NS39 (2025) 2-25 https://doi.org/10.26686/jnzs.iNS39.9890

That broken sign (see Fig.1) is thus a leftover from an epoch of the Internet that has largely passed, at least in New Zealand. It provides a tangible reminder that the Internet now has its own history—entire eras being compressed into its relatively short existence—and has become part of the broader expanse of the past that we look back on. The Internet café sign is also the archaeological equivalent of a 404 Page-Not-Found error. It stands for the transience of those online worlds where many of us have spent large parts of our lives. Countless websites have been created since the advent of the World Wide Web in the 1990s, places where we have fed our curiosity, shopped and socialised, exchanged opinions, watched videos, listened to music. Many will no longer be online. "It is often maintained that the average lifetime of a web page," Internet historian Niels Brügger reminds us, "is two months."[4]

Such matters have been at the forefront of my mind lately, as I've been spending much time exploring archives of websites past, searching for clues among the digital debris of what sometimes now seem like distant worlds. The main subject of research has been popular electronic music in New Zealand, with attention largely given over to the work and career of computer musician Luke Rowell. Born in 1983 in Lower Hutt, Rowell grew up not far from Bunny Street. However, the Internet café he frequented as a teenager, Net.Cafe, was on nearby Queens Drive and has left no physical traces behind.

In the 2000s, Rowell found national success as synthpop solo-act Disasteradio before gaining an international online profile in the early 2010s under another alias, Eyeliner.[5] The 2015 Eyeliner album, *BUY NOW*, is now regarded as a classic of the global vaporwave movement (more on which below). The main outcome of my research will be a book about *BUY NOW* for 33 1/3 Oceania, a series of short monographs on significant albums from Australia, New Zealand, and the wider Pacific region.[6] Thus far, the series includes several New Zealand albums, including the debut LPs of 1970s glam-rock band Space Waltz and 1980s duo The Front Lawn, as well as Bic Runga's *Drive* (1997). When I began contemplating a proposal, *BUY NOW* was an obvious choice. In 2020-2021, as Music Curator at the Alexander Turnbull Library, I'd been closely involved with archiving the album's digital production and was getting to know it well.[7] But I also saw *BUY NOW* as a springboard for investigating the music culture of more recent generations, including so-called Millennials such as Luke Rowell, those born between the early 1980s and mid-1990s, who grew up in the twin dawns of neoliberalism and the digital age.[8]

My research relating to *BUY NOW* and its wider musical, technological, and historical context has gone in many directions. As the album title might suggest, these have included the growth of consumerism during the 1980s, along with Lower Hutt history, shopping malls, advertising music, computer software, and music genres such as new age and smooth jazz. However, after conducting an interview with him in 2022, the significance of the Internet to Rowell's artistic development became a central theme. First dialling-up aged fifteen, his approach to creating and distributing music, building a career, his musical inspirations: all had evolved to a significant degree through the medium of the Internet. This is the territory I set out to discuss here.

Music has, of course, become thoroughly intertwined with the Internet over the last twenty-five years. In making the shift online, music famously served as a test case for other artforms. The established narrative starts in 1999 with the launch of Napster, an application that enabled people to freely share their personal MP3 libraries over the Internet, thereby bypassing retailers, record labels, and rights organisations.[9] Napster, Kazaa, LimeWire, and similar applications

were subsequently blamed for large drops in recording industry revenue. In the United States, income reportedly plunged over 50 percent during the 2000s.[10] Yet, so the story goes, the Internet eventually provided a viable solution to these financial woes. In 2023, the International Federation of the Phonographic Industry reported that streaming—the continuous playback of digital music over the Internet—now generates around 67 percent of total global revenue, which has recovered to pre-Napster levels.[11]

New Zealand music has felt the Internet's impact too, including a dramatic opening up of international markets to local artists. One measure of this change is the presence of New Zealand artists in the largest music market in the world, the United States. In the 50 years between 1940 and 1990, a total of 22,560 songs appeared on the *Billboard* Top 100 singles chart. Of these, just six were by New Zealand performers.[12] By contrast, since 2013, the New Zealand artist Lorde has—in her own right—had nine singles in the US Top 100.[13] At least thirteen additional songs performed, written, and/or produced by other New Zealanders have joined the prestigious "Billions Club" in the last decade, meaning they have achieved the feat of being streamed over one billion times.[14] While government initiatives during the 1990s and 2000s helped boost New Zealand artists' international profile,[15] the advent of the Internet has been decisive in taking their music to the world.

The unpredictable effects of online social networks ("going viral") has been a factor in the success of several of these tracks and such cases are often popular talking points. Music scholars have also conducted extensive research on how artists in other parts of the world have used social media platforms such as MySpace and Facebook to tap into global networks and find new audiences.[16] Other changes in music culture brought about by digital communication technologies, including virtual scenes, livecast music performances, and the rise of streaming recommendation algorithms have been studied too.[17] However, up until this point, New Zealand music's intersections with the Internet have attracted curiously little in the way of scholarly research. One exception is a 1997 article by Tony Mitchell on the NZPOP listserv, an email group set up at MIT in Boston in 1992, in which New Zealand music was discussed from various perspectives including those of international fans and local industry insiders.[18] Other writers have touched upon the Internet's use as a medium for promotion or for sourcing new music from overseas,[19] but many other topics await consideration.

Here, I want to explore an aspect that came to attention during the interview I conducted with Rowell: that his online experiences had taken place against the backdrop of the Internet's own rapid development over twenty-five years. Rowell's career shows a digital native highly engaged with what the ever-evolving World Wide Web afforded at different moments: it offers a case study in change and adaptation. Of course, assessing the entire online footprint of an individual would now be a major task. Here, I am going to focus on three significant waypoints from Rowell's Internet journey. First, his involvement in the late-1990s and early-2000s with the scene relating to the music composition software Jeskola Buzz. Two, his entry into the Internet subculture of vaporwave in 2012. Lastly, his experience with music distribution in 2023. As well as presenting insights specific to Rowell's music, my aim is to also provide a taste of the broader potential and challenges of looking at New Zealand cultural history through the lens of the Internet.

Background

Luke Rowell has cited multiple childhood influences on his music. His parents' record collection included several classic Moog synthesizer albums, Wendy Carlos's classical

Switched-on Bach (1968) and US synthesizer group Hot Butter's *More Hot Butter* (1972), recordings that exposed him to the sounds of electronic music from an early age. Television theme tunes and advertising music also left a strong impression. Then, in 1989, the family acquired a Commodore 64 (C64), often touted as the most popular home computer of all time. Playing and sharing computer games subsequently became a favourite activity and game soundtracks a preferred musical genre. When Rowell began making cassette mixtapes a few years later to listen to on his Walkman, he initially filled them not with songs off the radio but with the bleeping soundtracks of games taped off the C64 speaker.[20]

The C64 featured an innovative sound chip, developed by the team who later founded synthesizer company Ensoniq, which Rowell learned to program. A few years later, a guitar teacher, Greg Jackson, introduced Rowell to another approach to creating computer music: MOD trackers. A kind of sample-based sequencer programme, trackers were originally invented to make music for games on the Commodore Amiga (a more powerful successor to the C64).[21] Running the MS-DOS-based Digitrakker on his family's 386 PC, Rowell could now layer and loop audio samples extracted from games, using a QWERTY keyboard to input note values. An interest in creating music started to take hold.

When he was around twelve years old, Rowell also got online, although initially not on the Internet as we now know it. Bulletin board systems (BBSs) were privately-run computer servers that people could access through the telephone network using a modem. Only limited numbers of users could be logged into a BBS simultaneously, but they were precursors to websites in many ways, offering downloads, games, chat rooms, and access to international newsgroups. In 1995, on the cusp of the World Wide Web becoming a truly practical proposition with browsers such as Netscape Navigator, there were around 350 public BBSs operating across New Zealand.[22] Rowell told me that he accessed several BBSs in the Wellington calling area, including Welcom, which offered a "Large file archive, EEEEK bits magazine, Datanet Computer News, Online shopping."[23] Another BBS (Net Central) that Rowell dialled into was run by a schoolfriend who kept the server in his bedroom.

Lest the picture being sketched here becomes too techno-centric, there were also important real-world influences on Rowell's subsequent musical direction. Upon entering Hutt Valley High School, for instance, he was exposed to various strands of contemporary rock music through swapping dubbed cassettes with friends. He was also introduced to the Wellington punk scene by his older brother, where he made contacts who would later prove valuable when building a music profile in his early twenties. But it is evident that, even before he began to explore the World Wide Web, computer technology served as an important mediator of entertainment, creativity, and social connection.

Early years online

Luke Rowell first logged onto the Internet and the World Wide Web in 1998, using his father's work dialup connection. At this time, Facebook and Wikipedia did not yet exist, and Google Search had only been launched the previous year. The most popular websites were AOL, Yahoo, and GeoCities.[24] New Zealanders had already begun to embrace the Internet, with over half a million registered local users by February 1998.[25] There were also 8,600 active websites ending in .nz, with the first TradeMe and Warehouse websites being launched the following year.

At this point in the discussion, it can be noted that much of the World Wide Web's early history is preserved in online archives. A crucial resource is the Seattle-based Internet Archive's Wayback Machine, which began archiving the web in 1996.[26] Another repository I've used is the National Library of New Zealand's web archive.[27] They have proved a useful combination. The Wayback Machine crawls most of the web but can miss the deeper layers of a website's URLs. The collection of the National Library of New Zealand, on the other hand, includes around 10,000 New Zealand sites mostly dating from after 2008.[28] The Library's curated approach means that websites are generally captured in their entirety, even if there are hundreds of thousands of individual URLs involved.[29] Some snapshots of historical webpages from these archives will be included below to illustrate Rowell's journey and as a visual index of change, showing how far we've come in website design since the late 1990s.

Back in 1998, downloading games was Rowell's top priority. But he was soon drawn into the world of a freeware music program: Jeskola Buzz. More sophisticated than the MOD trackers he'd previously used, Buzz also came with its own global online community. Many users hailed from the European demoscene, including Buzz's creator, Oskari Tammelin, from Finland.[30] The demoscene was a computer subculture originating in the mid-1980s dedicated to creating "demos," audiovisual demonstrations of programming skill often appended as introductory brags to games which had been "cracked" (i.e., had their copyright protection removed).[31] Demos typically incorporated MOD tracker music. A few New Zealanders were already involved in the demoscene. In the late 1980s and 1990s, for instance, the game-music composer Blair Zuppicich had created music for several demogroups with members in various countries.[32] Rowell interacted with the Buzz community using an Internet technology that predated the World Wide Web. Internet Relay Chat (IRC) was a real-time messaging system invented in Finland in 1988 to extend the capabilities of BBSs.[33] Using an IRC client application to access the #buzz channel, here he picked up advice about Jeskola Buzz, general music composing tips, and listening recommendations.[34] Buzz would serve as his main creative platform for the next ten years.

In 2000, his final year at Hutt Valley High School, Rowell began uploading his own music to the distribution website MP3.com under the alias Disasteradio. The name, taken from a 1950s Japanese crystal-set packaged in a mushroom cloud-emblazoned box that he had seen in a library book, conveyed the "camp science"[35] aesthetic he wanted to develop. Perhaps the earliest online vestige of Disasteradio is a website Rowell set up using a free UK hosting service. This website was first captured by the Wayback Machine on April 4, 2001, showing a launch byline date of February 8, 2001 (see Fig.2). A few more instances of the site were captured during 2001, but none thereafter, so it's unclear how long it remained online.

It is an instructive experience browsing the archived Disasteradio website, with its game-themed images and archaic contact details, including EFnet IRC username and Napster ID. Clicking on the MP3.com hyperlink shown in the centre of Fig.2 conveys one not to a live URL (the original site is long closed) but to another Wayback Machine archived page, which then immediately redirects to another link. As it happens, the earliest preserved instance of the final link destination dates to November 30, 2003,[36] by which time—the archived page declares—Rowell had already moved Disasteradio's music to another site: MP3.com.au. Clicking the new link, you are quickly redirected through another archived URL, finally arriving at a page first captured on February 1, 2003 (see Fig.3). Such jarring leaps back and forth in time between Wayback Machine hyperlinks are not uncommon. A web archive can rarely provide a fully synchronised snapshot of an entire web-sphere of interest, consisting, as Brügger describes, of

"a patchwork of overlapping, but not identical times and spaces, and … is therefore less consistent than the online web from which it is created." [37] Furthermore, as anybody who has explored such archives will attest to, the patchwork will usually be full of holes: missing display files, non-functioning Flash animations, and unpreserved URLs now forever lost to time.

Figure 2: Disasteradio website, archived April 4, 2001, accessed at https://web.archive.org/web/20010404015225/http://www.disasteradio.f2s.com/.

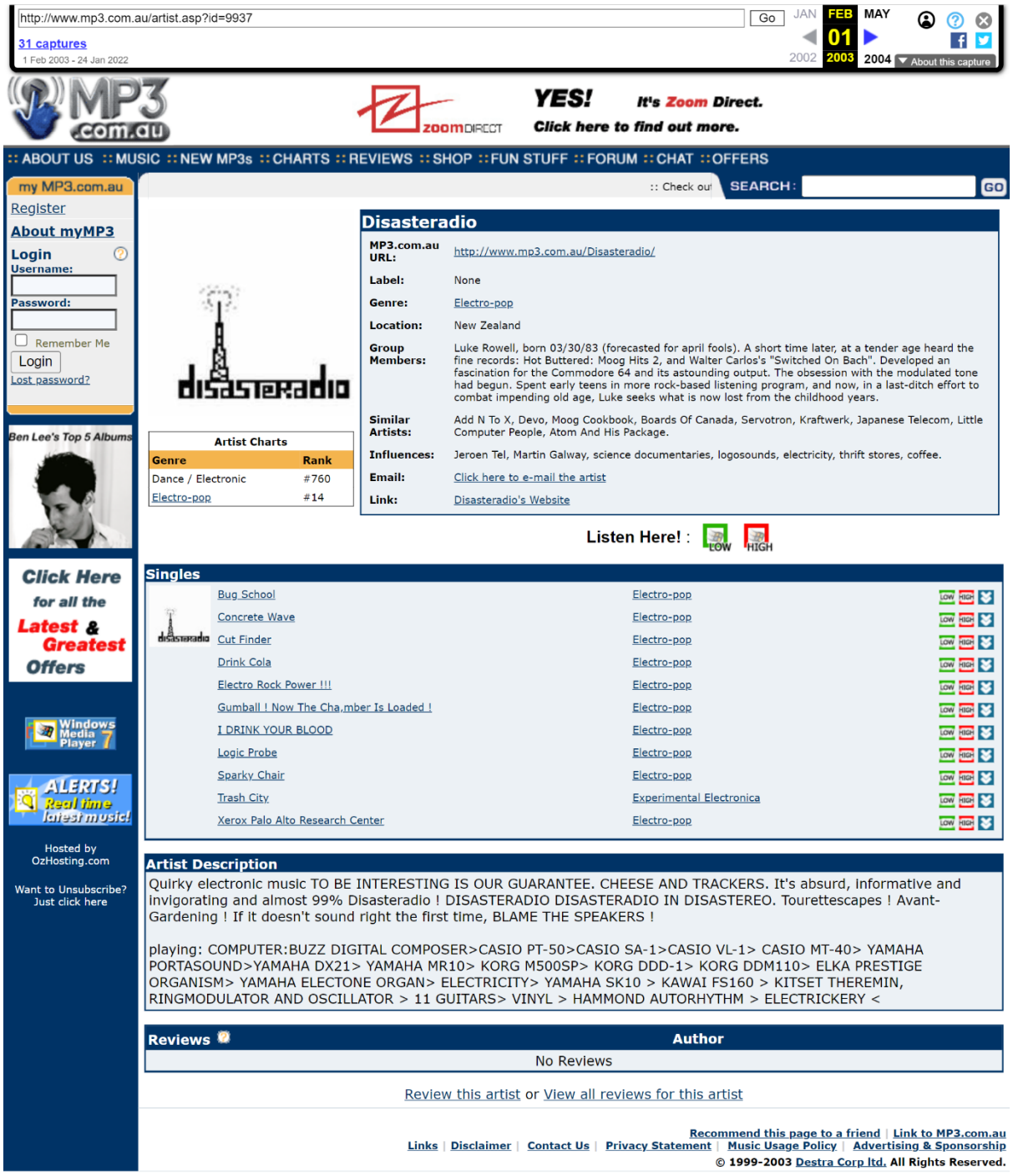

Figure 3: "Disasteradio," MP3.com.au, archived February 1, 2003, accessed at https://web.archive.org/web/20030201224956/http://www.mp3.com.au/artist.asp?id=9937.

Returning to 2001, Rowell also started uploading his music tracks to other filesharing websites besides MP3.com. These include one of the earliest sites of this kind, the US-based Internet Underground Music Archive (1993-2006) which, before the World Wide Web, had operated as an FTP (File Transfer Protocol) and Gopher service.[38] He also placed music on NZmp3.com and MP3 Powered New Zealand (mp3.co.nz), two of a number of New Zealand-based music

download sites operating in those early years.[39] These now-vanished websites of the early 2000s (and those cited here are just a small sample) suggest something of a counter-history to the Napster-centred narrative mentioned above.[40] In the era before iTunes, YouTube, and Spotify, these were platforms that independent musicians might use to take their music to the world. They also encompass local ventures that have similarly been largely overwritten in our consciousness of recent New Zealand music history.

Each of these music distribution websites had its own operating model. Significantly, those which Rowell used generally enabled people to listen to and download music without payment. As his career progressed, he would continue to encourage free sharing of his music, going on to adopt the Creative Commons licensing system for this purpose.[41] He later ascribed this approach to the influence of the DIY punk scene in Wellington.[42] But he'd also been inspired by a certain technological utopianism encountered as a teenager. As he told me:

> I saw a mindset of technology in the early 90s, with things like MIT's Media Lab … [the TV series] *Beyond 2000*, and the early Internet and bulletin board systems, where it's a very open access, free for all, everybody's learning something, everybody's giving what they can, and everybody takes what they want. I've always thought that the future would be like that.[43]

Indeed, as part of the Jeskola Buzz community, he'd collaborated on designing and testing open-source enhancements for the programme. He wanted to be similarly open in sharing his music with the world. Such an approach reflects a longstanding ethos in computer culture sometimes referred to as "the hacker ethic." Stewart Brand's saying "Information wants to be free" is a classic expression of this mindset.[44]

Figure 4: Front cover of Disasteradio, *DSIR: Dance Self-Instruction Record* (2003, self-released).

The music of Disasteradio is itself very much influenced by computers, computer games, and early Internet culture. This influence is evident in album and track titles such as *System That Never Fails* (2003), *Western Digital* (2004), "Xerox Palo Alto Research Center," "Arcadescape," and "Computer Whiz." Another track, "48 Kilobytes," opens with a recreation of the noises made by of a dialup modem, one of the signature sounds associated with the early Internet.[45] The 2003 album it comes from, *DSIR: Dance Self-Instruction Record* (see Fig.4), itself borrows a local acronym (DSIR) from the former Department of Scientific and Industrial Research, many of whose research centres were based in Rowell's hometown Lower Hutt. It's a good example of how he weaves covert local references into music that otherwise adopts a global musical language of synthesizers and drum-machines.

Vaporwave

While the Internet served as a launchpad for Luke Rowell as an artist, it was as a live performance act that Disasteradio broke through. Gigging around Wellington from 2002, he gained some influential supporters. These included music entrepreneur Ian Jorgenson (a.k.a. blink), who was on the cusp of launching A Low Hum (ALH), a magazine, record label, and promotion company that would become a major force in New Zealand independent rock music in the 2004-2016 period.[46] Disasteradio subsequently featured on many ALH national tours that Jorgenson organised. Rowell also played support for major local bands such as The Mint Chicks and Supergroove, and, in Australia, for the group Regurgitator. He also undertook several shoestring international tours of his own. By 2011, he'd performed over 320 shows and released eight albums, most recently *Charisma* (2010).

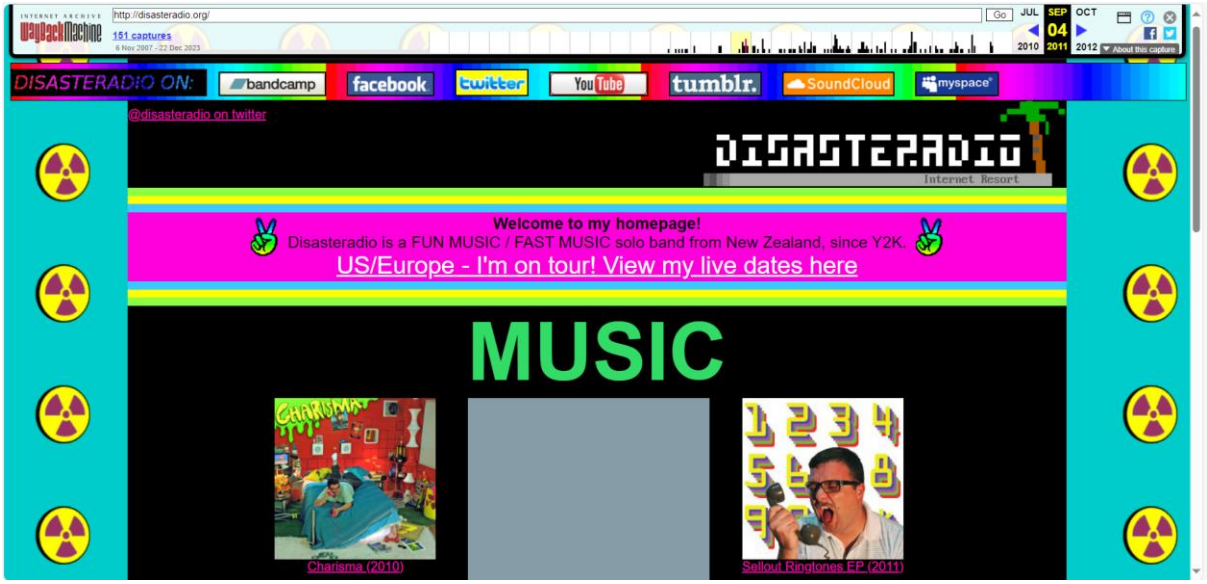

Figure 5: Disasteradio website (detail), archived September 4, 2011, accessed at https://web.archive.org/web/20110904010110/http://disasteradio.org/. The archived version of this page includes various animated elements. The grey rectangle at centre bottom is a digital artifact generated by non-functioning embedded content.

Rowell had by this stage also updated the Disasteradio website several times. As with the site's 2001 incarnation, the September 2011 version (see Fig.5) has a retrospective visual style, but with a marked shift away from the monochromatic evocations of 1960s-1970s computing. The 2011 Disasteradio banner instead harks back to 1980s computer pixel-art, while the lurid colour

scheme, stock typefaces, and somewhat clunky layout are evocative of 1990s website design. What had occurred in the interim was that new visual aesthetics had emerged which drew inspiration from the Internet itself, including reviving the design clichés of the early web.[47] Somewhat comparable is the website of Paper Rad, a US art collective who were well-known to those in Rowell's circle around this time, with its similar saturated colours and pixelated graphics.[48]

Along the top ribbon of Disasteradio's 2011 website, however, is a more up-to-date selection of links to external platforms. Bandcamp, Facebook, Twitter, and the rest had all been established since 2002 (although MySpace was well past peak popularity by 2011). The advent of these large platforms signifies the emergence of what is often referred to as "Web 2.0," including the rise of blogging and social media, and the ability for users to add content to websites in the form of comments, likes, and shares.[49] Web 2.0 was also proving to be a seedbed for new cultural formations, including the so-called "Internet genres" discussed below.

In 2011, Disasteradio also "went viral" for the first time, after the YouTube music video for "Gravy Rainbow" (from *Charisma*) was featured on the blog of US comedian Daniel Tosh, known for his Comedy Central television series *Tosh.O*.[50] Views of the video soared and now stand at over one million. The following year, Rowell's music received further attention on the Internet—and this time with even more significant consequences—when it was adopted into a new genre of music called vaporwave. The process by which this happened reveals much about the complex interactions and feedback loops of online music in the age of Web 2.0.

One context for Rowell's entry into the vaporwave scene was that he had struck out in a new musical direction. Partly because of its technical complexity, the *Charisma* album had taken three years to produce, and Rowell was experimenting with more streamlined methods under the alias Eyeliner. The first product of this new side-project was *High Fashion Mood Music* (2012), a study in Muzak, advertising soundtracks, and new age. The idea of creating synthesized elevator music might initially strike one as an ironic joke. Yet, as the UK critic Adam Harper later commented, "Eyeliner [has] clearly gone to too much care and effort … for this musical experience to be a simple, cynical, irony-as-opposite affair."[51] In my upcoming book on *BUY NOW*, I look more closely at this combination of irony and sincerity, satire and homage, purveyed by Eyeliner and other vaporwave artists.[52]

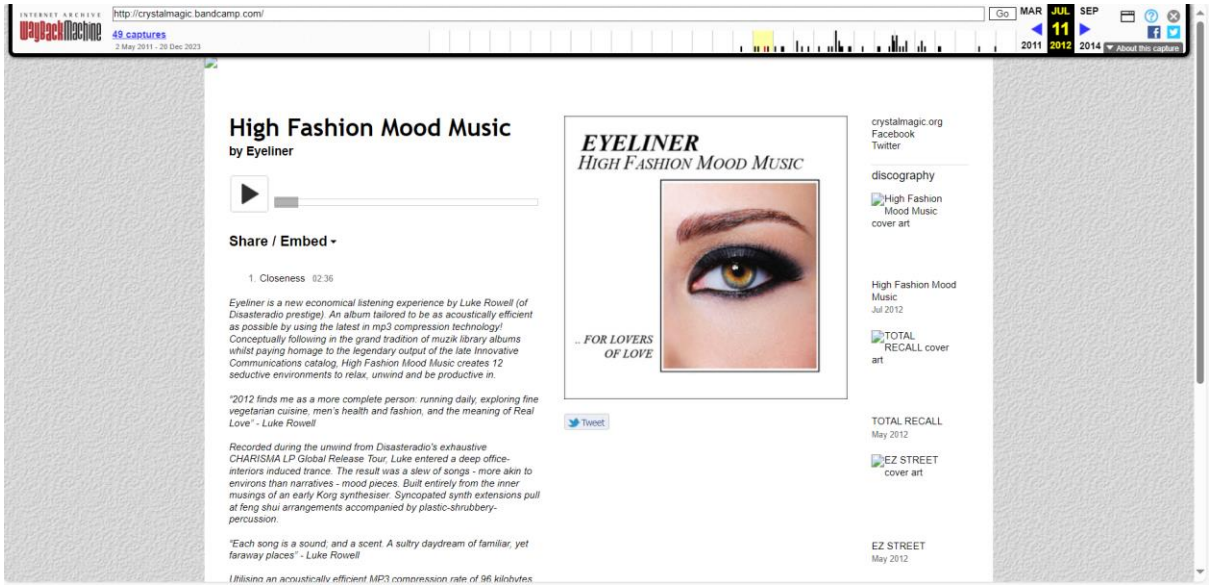

Figure 6: "Crystal Magic Records," Bandcamp (detail), archived July 11, 2012, accessed at https://web.archive.org/web/20120711052205/http:/crystalmagic.bandcamp.com/.

High Fashion Mood Music (*HFMM*) came out on Crystal Magic Records (CMR), an independent New Zealand label founded by Fraser Austin, himself a musician working in synthpop and chiptune styles.[53] The release day (July 11, 2012) is preserved through the archived CMR page on independent distribution site Bandcamp (see Fig.6). As we will see, the survival of this exact moment in Internet time has proved useful in untangling how Eyeliner was adopted into the vaporwave scene.

Eyeliner's musical style arose from various sources, including the television music of Rowell's childhood. There were new influences, too, coming through the Internet feeds, blogs, and videos shared within his circle of friends in New Zealand. The previous year, the track "Rain" by anonymous US artist called Computer Dreams had caught his ear, partly for its low-resolution digital sound reminiscent of those MP3 files shared back in the late 1990s.[54] That digital audio textures could be used to historically watermark music in this way intrigued him. *HFMM* was likewise mastered with the somewhat brittle sound of "acoustically efficient" MP3s.[55] He was not alone in these perceptions either. Other Crystal Magic artists were similarly exploring the sonic and visual aspects of Internet-mediated culture, including Real Player 7 (one of Fraser Austin's projects) and Power Nap (a solo project of Chris Cudby).

The second main context for understanding Eyeliner's adoption into vaporwave is the emergence of the genre itself. In many respects, the formation of vaporwave follows a familiar pattern. Viewed in terms of sociologist Jennifer Lena's four-type categorisation of music genres, vaporwave began as an "Avant-Garde" genre in 2010-2012, with a disparate group of artists around the world conducting new stylistic experiments, before transitioning into being a "Scene-based" genre with an established and growing community following.[56] Differentiating vaporwave is that these phases took place online. Such "Internet genres" began appearing in the late 2000s, with other notable examples including witch house and seapunk. Internet genres, as musicologist Laura Glitsos explains, are distinguished for having "emerged solely on or through digital platforms… [and continuing] to be played and shared exclusively through online networks."[57] The vaporwave scene, likewise, did not spring up in any geographical locale but rather on websites, notably Tumblr, 4Chan, and Reddit. "Vaporwave's

online subculture," Georgina Born and Christopher Haworth remark, "embodies the participatory, user-generated content ethos of 'web 2.0'."[58] Both musically and visually, its aesthetic is inspired by Western commercial culture of the late-1980s and 1990s, with an emphasis on corporate branding, consumerism, new technology (especially from Asia), and the early World Wide Web. Vaporwave's retrofuturist imagery has led to it being regarded as both nostalgic and utopian; its nostalgia being for the technologically liberated future envisaged in the 1990s, which never quite materialised.[59]

A crucial event in vaporwave's shift from being an "Avant-garde" to a "Scene-based" genre was its naming, often credited to UK critic Adam Harper's online article "Vaporwave and the Pop-Art of the Virtual Plaza," published on July 12, 2012 (the day after *High Fashion Mood Music*'s release).[60] Analysing a new style he perceived to be forming on Internet music websites, Harper chose "vaporwave," a term he had encountered as a user-generated tag in feeds on the website LastFM. Part of the attraction was vaporwave's apparent pun on "vaporware," a 1980s term for software promoted in advance but that never appears, which suited the genre's ironic exploration of the musical surfaces of marketing culture.[61] In the years since, vaporwave has taken off. The vaporwave community on discussion site Reddit now has over 280,000 subscribers, while one online archive of vaporwave music contains over 44,000 albums.[62] The genre has also had wider impact, including on mainstream singers such as Ariane Grande and Drake.[63] Somewhat inevitably, vaporwave's visual aesthetic has also been co-opted back into corporate advertising, including for the "dream flavored" Coca-Cola released in 2022.[64] Yet vaporwave has never progressed to becoming (according to Jennifer Lena's categories) a full-fledged "Industry-based" music genre, perhaps due to many artists' heavy reliance on unauthorised samples and to the style's subtly disconcerting ironies being difficult to translate for a mass audience.[65]

Returning to the nascent vaporwave scene of mid-2012, those involved quickly got down to the business of sorting out what the classic examples of the genre were. A mere four months after Harper's "Virtual Plaza" article was published, members of 4Chan's /mu/ (i.e., music) discussion board put together the first of many "vaporwave essentials" guides (see Fig.7).[66] Included among the fifteen albums on */mu/ VAPORWAVE ESSENTIALS* is Eyeliner's *High Fashion Mood Music*. Eyeliner albums feature on most of the vaporwave guides that have since appeared.[67] In 2022, the influential vaporwave YouTuber Pad Chennington ranked Eyeliner's *BUY NOW* among twenty-four vaporwave "classics of the classics."[68]

Figure 7: */mu/ VAPORWAVE ESSENTIALS* (2012). Source: https://www.girlsblood.com/2012/11/vaporwave-essentials.html.

So, how did this come about? While *HFMM* can now be readily perceived as having a vaporwave sensibility, the album's release predates the existence of vaporwave as a named genre. How did Luke Rowell's side-project on a small New Zealand label get noticed in the first place? Finding answers (or at least the best theories) has involved considerable sifting through the Wayback Machine web archive.

Among the earliest references to *HFMM* being akin to vaporwave was on the 4Chan /mu/ board, a few days after its Bandcamp release on July 11, 2012.[69] Yet several months would pass before the album was regularly mentioned in this forum. The key event in the interim was publication on August 28 of another essay by Adam Harper, "Isn't it Ironic?," in which he groups Eyeliner with the vaporwave artists he'd identified six weeks earlier.[70] Being covered by this critic, whose writings appeared regularly in respected music magazines such as *The Wire*, was probably crucial to Eyeliner's music being noticed and then adopted by the vaporwave scene. But how did Harper himself discover the album?

In 2023, I consulted with Adam Harper by email about this matter and two main theories emerged. First, that he discovered the album via the Bandcamp website. Significantly, on its release day *HFMM* had just four "tags" (the genre labels by which releases can be browsed and filtered on Bandcamp). An archived version of the release page from six weeks later, however, shows that the album had acquired many more tags in the interim, including "vaporwave" (see Fig.8). It transpires that Luke Rowell had read Harper's "Virtual Plaza" article, perceived its relevance to the music he was already creating as Eyeliner and added the tag. Newly tagged as "vaporwave," the Bandcamp website could well have led Harper (and others) to discover the

album.[71] This theory assumes that a kind of Web 2.0 feedback loop occurred: Harper's article prompting Rowell's action, which then caught Harper's attention.

tags: corporate jazz electronic new age New Zealand

tags: corporate jazz easy listening electronic fashion forward new age office interiors cyber free free download hypnagogic pop internet music post-internet shareware vaporwave New Zealand

Figure 8: Bandcamp tags for *High Fashion Mood Music* from July 11, 2012 (top) and August 27, 2012 (bottom).[72]

The second theory is Eyeliner came to Harper's attention through a blog he subscribed to called Rose Quartz.[73] Noted for its coverage of new underground music, Rose Quartz had been one of fifteen blogs aggregated as part of another website, Altered Zones, a short-lived but influential offshoot of online music magazine Pitchfork.[74] Harper is certain he received news of *High Fashion Mood Music*'s release via Rose Quartz's RSS feed in July 2012.[75] Different network dynamics are probably involved here as Rose Quartz was run by a New Zealander, Richard MacFarlane, who had previously covered Disasteradio and CMR releases. In addition to the appeal of Eyeliner's sound, the New Zealand connection likely helped prompt Rose Quartz to post about *HFMM* in the first place, the news of its release then reaching Adam Harper on the other side of the world.

Further Web 2.0 feedback loops beginning several months earlier are likely involved too. On April 23, 2012, Rose Quartz had posted about another new album, *札幌コンテンポラリー* [*Contemporary Sapporo*] by 情報デスクVIRTUAL [Virtual Information Desk].[76] It was this Rose Quartz post, Harper writes in an email, "that put me on to vaporwave in the first place."[77] From here, he had gone on to discover further work by 情報デスクVIRTUAL, one of multiple aliases for US vaporwave artist Ramona Langley, as well as other releases mentioned in the vaporwave-defining "Virtual Plaza" article three months later.[78] The Rose Quartz post from April 23 was written by New Zealand digital artist Tim Gentles, who himself may have come across *札幌コンテンポラリー* [*Contemporary Sapporo*] through the same Internet feeds that were catching Rowell's attention in these years. Or perhaps Rose Quartz played a part in Rowell becoming aware of these new styles. On September 6, 2011, for instance, Gentles had posted about the Computer Dreams release that would become a major influence on Eyeliner (see above).[79]

Whatever their precise concatenation, these various Internet micro-events help us understand Luke Rowell's path to becoming the noted vaporwave artist he is today. Several Web 2.0 feedback loops, in which he became both an early adopter and early adoptee of the genre, were clearly involved. And this was not simply a case of a New Zealand artist "getting noticed" by an overseas critic. Other New Zealanders were stirring the Web 2.0 crucible that led to vaporwave's emergence prior to Rowell's direct involvement. It's a good example of how the "total time-space compression"[80] generated by the Internet, the collapsing of spatial and temporal distances, enabled people in New Zealand to be directly involved in the formation of a new global style. Lastly, much of this story has been deduced from research using web archives. But personal testimony from those involved has been crucial: analogue memory has helped make the digital speak.[81]

Eyeliner in 2023

For the third waypoint on Luke Rowell's internet journey, we move forward to 2023. The Disasteradio website has stayed much the same since 2012, with the intervening decade seeing Rowell's active online presence shift to Twitter (now X) and Bandcamp, where his pages have had regular makeovers (see Fig.8). Bandcamp has itself become perhaps the largest online platform for independent artists and record labels. Another major development since 2012 is the growing dominance of streaming as a source of recording industry revenue, growing from 6 percent to 67 percent of global income.[82] How does Rowell's music fit into this latest era of Internet music? Here I am going to finish with some observations relating to the online reception of Eyeliner's *BUY NOW* in the years since its release.

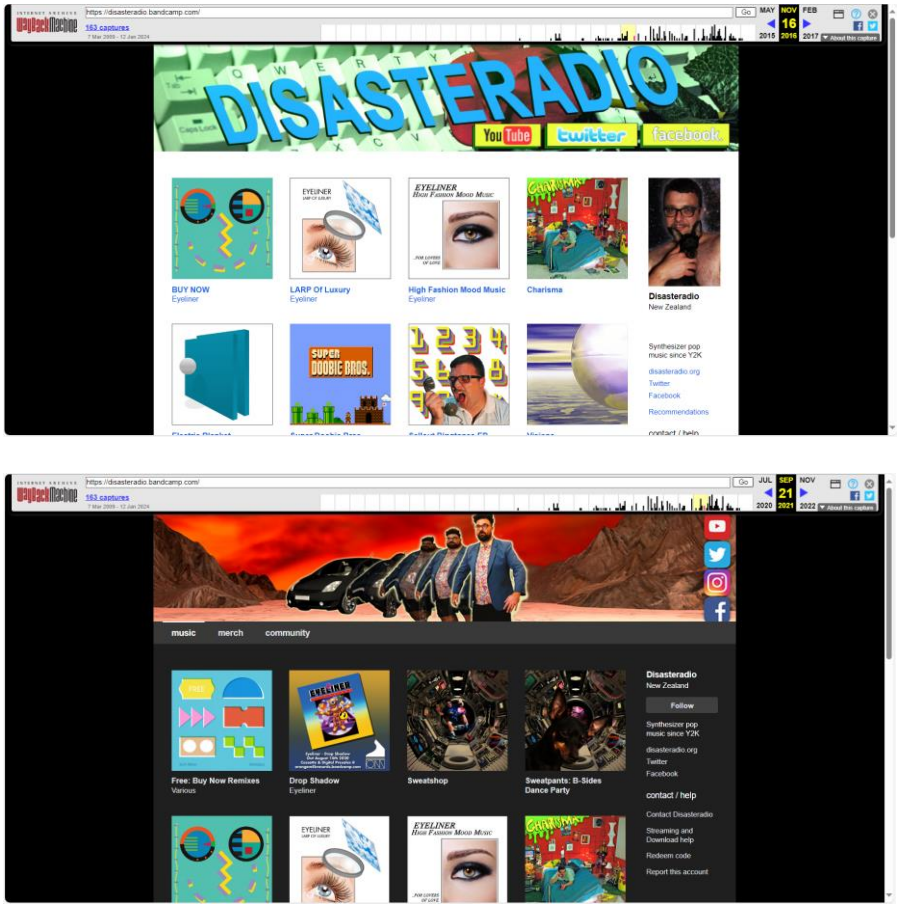

Figure 8: "Disasteradio," Bandcamp, archived on November 16, 2016 (top) and September 21, 2021 (bottom).[83]

On June 27, 2015, *BUY NOW* was released by the US label Beer on the Rug (BOTR) as a digital download and shortly afterwards as a limited-edition cassette. The album did well in the first months. It received positive reviews, the cassette edition sold out, and digital sales were healthy.[84] Archival snapshots show that for several weeks *BUY NOW* was among the globally top-selling Bandcamp releases with either a "vaporwave" or "New Zealand" tag.[85] But it didn't enter the New Zealand music charts. These did not take account of Bandcamp sales until December 2016 and, after that, only included sales to New Zealand customers.[86] Traditional chart systems based on national territories, however, can be less relevant for artists with globally dispersed followings like Eyeliner. The wide geographical distribution of Eyeliner's audience means that Bandcamp has also been effective as a shopfront for reissues of *BUY NOW*

on physical formats released since 2015. These have included several cassette and vinyl editions of the album, as well as on more obscure formats used for vaporwave releases, MiniDisc and 3.5-inch floppy disk, which further express the genre's interest in obsolete technology of the 1990s.

Twenty years after the demise of Napster, the example of *BUY NOW* also demonstrates that unofficial file-sharing is still alive and well. Anonymous uploads of tracks from the album began only days after its release. Such uploads have since appeared on YouTube, SoundCloud, Internet Archive, and Mega. Of course, because the album was released under a Creative Commons licence, these uploads have the artist's tacit blessing (provided they are not monetized). One of the most significant cases is *BUY NOW*'s inclusion on Vapor Memory, a YouTube channel dedicated to archiving notable vaporwave albums. Here, as of August 2023, it had accumulated over 275,000 views, 7,000 likes, and 450 comments.[87] The comments provide interesting insights into audience reception of the album. Many comments mention Eyeliner's retro 1980s-1990s sound, although not necessarily in relation to mainstream popular music. The most common comparisons are instead to the sounds of 1990s CD-ROM games and computer applications. The longest comment-thread discusses the music's similarity to the accompaniments featured in Kid Pix, a drawing-animation program first released in 1989. (Rowell tells me that he had not previously heard of Kid Pix.) Such comments reinforce points made above about vaporwave's nostalgic attachment to earlier eras of home computing. They also suggest that artists such as Rowell are helping rediscover a musical language of synthesized music accompaniments previously little considered in the historiography of 1990s popular music.

Lastly, we come to streaming. Rowell first began place his music on streaming services in 2011. Soon after its release, *BUY NOW* became available on numerous platforms. Spotify, which has a roughly 30 percent share of the world market,[88] has proved by far the most significant, both for this album and Eyeliner more generally. A notable feature of streaming platforms is the detailed data they gather and make available about who accesses an artist's music, from where, and how. With Spotify, some basic information is publicly viewable, such as how many times particular tracks have been streamed and an artist's total number of unique listeners over the previous month. Other data is only available to the artists themselves. Rowell kindly made information about streaming of his music available, which informs the analysis below.

By August 10, 2023 (the day Rowell supplied the data), tracks from *BUY NOW* had been collectively streamed 5,150,373 times on Spotify. The geographic locations of Eyeliner's Spotify audience, data only available as a moving 28-day window, is revealing. Going by the 28-day snapshot recorded in Fig.9, which shows the twenty countries with Eyeliner's largest audiences, Rowell is very much a New Zealand cultural exporter. Around 56 percent of his audience is in the United States; for context, this is the location for only around 20 percent of Spotify's 551 million users.[89] Within the US, Eyeliner has its largest audiences in cities such as Los Angeles, Seattle, Chicago, New York, Atlanta, Dallas, and Portland (Oregon), a city known for its vaporwave artists. Given vaporwave's themes, it's perhaps unsurprising that Eyeliner does such good business in the cradle of consumer culture. By contrast, New Zealand is eighteenth in the rankings, accounting for less than 1 percent of Eyeliner's Spotify audience. Viewed on a per capita basis however, New Zealand comes in fourth behind the US, Canada, and Finland, suggesting there is still solid local awareness of Rowell's vaporwave work. The Eyeliner audience also skews heavily towards Millennials and Gen-Z (likely an older cohort of

Gen-Z), who together account for around 94 percent.[90] The demographic profile is strong confirming evidence that this music, heavily influenced by sounds of the 1980s and 1990s period, stimulates greatest identification with those who grew up in these years.

Rank	Country	Listeners	Rank	Country	Listeners
1	United States	21,310	11	Netherlands	474
2	Canada	2,115	12	Poland	472
3	United Kingdom	2,012	13	Sweden	447
4	Australia	1,187	14	Spain	378
5	Brazil	1,088	15	Argentina	324
6	Germany	1,061	16	Finland	313
7	Mexico	1,000	17	Chile	303
8	France	689	18	New Zealand	269
9	Italy	480	19	Norway	228
10	Japan	475	20	Turkey	153

Figure 9: Top twenty country locations of Eyeliner's Spotify listeners, July 14 to August 10, 2023. Source: Luke Rowell.

Spotify also provides Rowell with an ongoing source of income. In a 2022 *Stuff* article, he disclosed that payments based on streams of Eyeliner and Disasteradio tracks had reached a level sufficient "to pay for his weekly grocery shop."[91] These payments are currently his largest source of income from music, topped up with less-regular Bandcamp sales. The bulk of the streaming income derives from tracks off *BUY NOW*. Granted, the royalty rates that Spotify allocates independent musicians have been the subject of ongoing debate and criticism.[92] Rowell himself regards them as inadequate.[93] But being an independent solo-artist has some advantages. By retaining all rights to his music, both the musical compositions and recordings, none of Rowell's streaming income is syphoned off to a music publisher or label. Nor does it need to be divided among bandmates or songwriting partners.

Yet Eyeliner's music, including *BUY NOW*, also remains freely accessible. The open-source culture, "hacker ethos," punk-DIY approach that Rowell adopted in the early 2000s fits surprisingly well, twenty years later, within the economies of streaming and physical reissues. That members of his audience are prepared to use Spotify for its convenience or to purchase luxury vinyl editions of the albums, has only reinforced Rowell's belief in an open-access model.

His journey through twenty-five years of the Internet thus comes full circle. Being online supplied many preconditions for his artistic development and music career. But then, in Disasteradio's prime period, Rowell grew a national audience through live gigs and student radio. This plan worked to the extent that Disasteradio remains his most identifiable artist-brand in New Zealand. But such local recognition counts for less online compared with becoming a profiled artist in a cult underground genre. Eyeliner currently makes up over 96 percent of all Rowell's Spotify streams, with a rolling average of around 41,000 monthly listeners (roughly the same as local contemporaries TrinityRoots). Disasteradio manages around 600. The Internet has proved a natural fit for Rowell's music in the long term.

Conclusion

In tracking Luke Rowell's Internet journey, we have come a long way down the information superhighway, from bulletin board systems in the 1990s to Spotify in 2023. The journey has included stopovers at MP3 download websites, the advent of Web 2.0, and the emergence of Internet genres such as vaporwave. I have also touched on the changing visual appearance of the World Wide Web over a quarter century, including how the nostalgic impulse swiftly subsumed the design styles of the early years. Another theme has been the challenge of discovering the histories hidden within web archives.

My main objective has been to cast light on the Internet's impact on one New Zealand musician. But I've also sought to demonstrate how the passage of information and influence was often two-way. Luke Rowell has been an apt case study for this purpose, given he has for so long been attuned to computer technology, its affordances, and aesthetics. But there are many more examples that could be studied, including his labelmates on Crystal Magic Records, self-described "Internet kid" Lorde,[94] and the entrepreneurs who established different local music platforms and websites over the years. Niels Brügger and Ian Milligan observe that "[if] researchers today want to fully understand the present, as well as our past from the mid-1990s onwards, the Web will play a critical role."[95] This also applies, I would contend, to the study of New Zealand music.

---

[1] This article is a revised version of the JD Stout Lecture, delivered on November 1, 2023, at Victoria University of Wellington. A video of the lecture, which includes more illustrations of historical websites, is currently available at the following link: https://www.youtube.com/watch?v=l9lEEqV42js. For their assistance with this article and the research behind it, I am grateful to the Stout Research Centre for New Zealand Studies, the Alexander Turnbull Library, Jon Dale, Adam Harper, Kate Perry, Fraser Austin, Chris Cudby, Luke Rowell, and an anonymous reviewer who suggested useful supplementary references.

[2] This Internet café was incorporated as Internet Express in 2002, changing name to Elite Internet in 2011. The café last appears in the 2014-2015 issue of the Wellington Yellow Pages business directory, one of only two Internet cafés listed.

[3] For an early mention of computer Internet access being made available in a public venue, see John Russell, "Auckland," *Rip It Up*, November 1994, 38. For a 1996 magazine article covering various Internet cafés operating in Auckland at that time, see Chris Keall, "Would you like a websurf with that cappuccino?," *PC World*, September 1996, 173.

[4] Niels Brügger, "Probing a Nation's Web Domain: A New Approach to Web History and a New Kind of Historical Source," in *The Routledge Companion to Global Internet Histories*, eds. Gerard Goggin and Mark McLelland (New York: Routledge, 2017), 63.

[5] For an informative article on Luke Rowell, see Martyn Pepperell, "Disasteradio," *AudioCulture*, July 16, 2021, https://www.audioculture.co.nz/profile/disasteradio.

[6] The 33 1/3 Oceania series is one of several regional offshoots of the 33 1/3 series, established in 2003 by Continuum and now published by Bloomsbury Academic.

[7] See Michael Brown, "Download Now… Free!," *National Library of New Zealand*, May 27, 2021, https://natlib.govt.nz/blog/posts/download-now-free.

[8] Millennials are also known as Generation Y. See Bobby Duffy, *Generations: Does When You're Born Shape Who You Are?* (London: Atlantic Books, 2021), 17.

[9] For a history of music filesharing from Napster through until the early 2010s, see James Allen-Robertson, *Digital Culture Industry: A History of Digital Distribution* (New York: Palgrave Macmillan, 2013).
[10] Richard James Burgess, *The History of Music Production* (Oxford: Oxford University Press, 2014), 154.
[11] Calculated from IFPI [International Federation of the Phonographic Industry], *Global Music Report 2023*, accessed August 20, 2023, https://www.ifpi.org/wp-content/uploads/2020/03/Global_Music_Report_2023_State_of_the_Industry.pdf, 11. Global revenue figures are given in non-inflation-adjusted terms.
[12] Timothy J. Dowd, "Music from abroad: The internationalization of the US mainstream music market, 1940-1990," in *Redefining Mainstream Popular Music*, eds. Sarah Baker, Andy Bennett, and Jodie Taylor (New York: Routledge, 2013), 127. For more background on the method used to calculate these findings, see Timothy J. Dowd, "Concentration and Diversity Revisited: Production Logics and the U.S. Mainstream Recording Market, 1940-1990," *Social Forces* 82, no.4 (June 2004): 1433.
[13]"Chart History: Lorde," Billboard, accessed October 10, 2023, https://www.billboard.com/artist/lorde/chart-history/tlp/.
[14] Gareth Shute, "The Billion Streamers," *AudioCulture*, August 4, 2023, https://www.audioculture.co.nz/articles/the-billion-streamers.
[15] See Michael Scott, *Making New Zealand's Pop Renaissance: State, Markets, Musicians* (Burlington: Ashgate, 2013).
[16] For example, see: Ole J. Mjøs, *Music, Social Media and Global Mobility: MySpace, Facebook, YouTube* (New York: Routledge, 2012); and Melissa A. Click, Hyunji Lee and Holly Willson Holladay, "Making Monsters: Lady Gaga, fan identification, and social media," *Popular Music & Society* 36, no.3 (2013): 360–79.
[17] For some examples, see: Andy Bennett and Richard A. Peterson, eds, *Music Scenes: Local, Translocal, and Virtual* (Nashville: Vanderbilt University Press); Sofia Johansson, Ann Werner, Patrik Åker and Gregory Goldenzwaig, *Streaming Music: Practices, Media, Cultures* (New York: Routledge, 2018); Nicholas Cook, Monique M. Ingalls and David Trippett, eds, *The Cambridge Companion to Music in Digital Culture* (Cambridge: Cambridge University Press, 2019); and Holly Rogers, Joana Freitas, and João Francisco Porfírio, eds, *YouTube and Music: Online Culture and Everyday Life* (New York: Bloomsbury Academic, 2023).
[18] Tony Mitchell, "New Zealand Music on the Internet: A Study of the NZPOP mailing list," *Perfect Beat* 3, no.2 (1997): 77-95.
[19] For example, see Scott, *Making New Zealand's Pop Renaissance*, 102-103, 109-110; Chris Gibson and Andrew McGregor, "The Shifting Spaces and Practices of Dance Music DJs in Dunedin," in *Home, Land and Sea: Situating Music in Aotearoa New Zealand*, eds. Glenda Keam and Tony Mitchell (North Shore: Pearson, 2011), 210; Scott Muir, "Music, Community, and the Creation of Dunedinmusic.com," in *Dunedin Soundings: Place and Performance*, eds. Dan Bendrups and Graeme Downes (Dunedin: Otago University Press, 2011), 148-54.
[20] See Grant Smithies, "Out From Under the Radar," *Stuff*, September 11, 2011, http://www.stuff.co.nz/entertainment/music/5601379/Out-from-under-the-radar.
[21] Karen Collins, *Game Sound* (Cambridge: Massachusetts Institute of Technology, 2008), 57-9.
[22] Richard Vowles, "List of NZ BBS's for Feb 1993", Google Groups, accessed October 12, 2023, https://groups.google.com/g/nz.general/c/3VbDNz6CQkQ?pli=1. This listing contains details for 294 public BBSs. Consulting later region-specific lists also available online it seems the national total probably reached around 350 by 1995. There were also an unknown number of private BBSs

operating. For more on BBSs in New Zealand, see Keith Newman, *Connecting the Clouds: The Internet in New Zealand* (Auckland: Activity Press, 2008), 116-24.
[23] Vowles, "List of NZ BBS's for Feb 1993."
[24] Philip Bump, "From Lycos to Ask Jeeves to Facebook: Tracking the 20 most popular web sites every year since 1996," *Washington Post*, December 15, 2014, archived version accessed at https://web.archive.org/web/20141215230046/http://www.washingtonpost.com/news/the-intersect/wp/2014/12/15/from-lycos-to-ask-jeeves-to-facebook-tracking-the-20-most-popular-web-sites-every-year-since-1996/.
[25] Statistics New Zealand, *New Zealand Official Yearbook 2000*, accessed October 3, 2023, https://www3.stats.govt.nz/New_Zealand_Official_Yearbooks/2000/NZOYB_2000.html. In the 1990s, new Internet connections were apparently being registered in New Zealand at a rate exceeding that in the United States. See Margaret Galt, "Reflections on Not in Narrow Seas: The Economic History of Aotearoa New Zealand 1," *Journal of New Zealand Studies* NS34 (2022): 91.
[26] "Wayback Machine," Internet Archive, accessed February 9, 2024, https://web.archive.org/.
[27] "New Zealand Web Archive | Te Pūranga Paetukutuku o Aotearoa," *National Library of New Zealand*, accessed February 9, 2024, https://natlib.govt.nz/collections/a-z/new-zealand-web-archive.
[28] The other main part of the National Library web archive is a collection of annual harvests of all websites ending in .nz. These harvests are not currently available for researchers to access. A sense of their size can be gauged from a February 2024 report that a total 746,636 domains were registered with the .nz suffix: "Market Data," Domain Name Commission NZ, accessed February 13, 2024, https://dnc.org.nz/market-data/.
[29] A case in point is the New Zealand music website *Amplifier*, which included 248,026 URLS. See: Sholto Duncan, "Turnbull Mixtape 4: Don't call it a comeback," *National Library of New Zealand*, May 12, 2016, https://natlib.govt.nz/blog/posts/turnbull-mixtape-4-don-t-call-it-a-comeback.
[30] For archived versions of early websites associated with Jeskola Buzz, see: Jeskola (https://web.archive.org/web/20000829032224/http://www.jeskola.com/); Buzz Track (https://web.archive.org/web/20010530231808/http:/www.buzztrack.com/05-19-2001.asp); and Buzz Machines (https://web.archive.org/web/20000919061900/http:/www.buzzmachines.com/).
[31] Andrew Whelan, "The Emergence of Vernacular Digital Music Cultures", in *The Routledge Companion to Global Internet Histories*, eds. Gerard Goggin and Mark McLelland (New York: Routledge, 2017), 444.
[32] "Blair Zuppicich," Demozoo, accessed March 20, 2023, https://demozoo.org/sceners/58941/.
[33] "History of IRC (Internet Relay Chat)," Daniel Stenberg, accessed December 2, 2022, https://daniel.haxx.se/irchistory.html.
[34] blink [Ian Jorgenson], "Disasteradio," *A Low Hum* 8 (2004): 28-30.
[35] Luke Rowell, interview with the author, Lower Hutt, June 24 and 30, 2022.
[36] "Disasteradio," MP3.com, archived version accessed at https://web.archive.org/web/20031130081629/http://artists.mp3s.com/artists/142/disasteradio.html.
[37] Niels Brügger, "When the Present Web is Later the Past: Web Historiography, Digital History, and Internet Studies," *Historical Social Research* 37, no.4 (2012): 109.
[38] For more on the Internet Underground Music Archive, see Bruce Haring, *Beyond the Charts: MP3 and the Digital Music Revolution* (Los Angeles: OTC Press, 2000), 35-8; and Jeremy Wade Morris, "Hearing the Past: The Sonic Web from MIDI to Music Streaming," in *The SAGE Handbook of Web History*, eds. Niels Brügger and Ian Milligan (London: SAGE Publications, 2019), 495, 498.
[39] For a contemporaneous article on mp3.co.nz, mp3.net.nz, and nzmp3.com, see Michael Foreman, "The internet comes alive to sound of Kiwi music,", *New Zealand Herald*, July 4, 2000, archived version accessed at

https://web.archive.org/web/20010521060755/http://www.nzherald.co.nz/storydisplay.cfm?storyID=142853&thesection=technology&thesubsection=general. Other New Zealand digital music distribution sites of this era included Coketunes, Digirama, and Amplifier, a rebranded version of mp3.net.nz.

[40] Cf. Allen-Robertson, *Digital Culture Industry*, 191.

[41] On Creative Commons, see Lawrence Lessig, *Free Culture* (London: Penguin Press, 2004).

[42] "Case Study: Luke Rowell DISASTERADIO," Creative Commons Aotearoa New Zealand, March 10, 2010, archived version accessed at https://web.archive.org/web/20100314013011/http:/www.creativecommons.org.nz/creative_commoners/luke_rowell_disasteradio.

[43] Luke Rowell, interview with the author, 2022.

[44] On the hacker ethic, see Allen-Robertson, *Digital Culture Industry*, 138-51.

[45] Morris, "Hearing the Past," 493.

[46] See Gareth Shute, "A Low Hum—Part 1," *AudioCulture*, August 3, 2014, https://www.audioculture.co.nz/articles/a-low-hum-part-1.

[47] In the visual arts, these developments include Net Art and Post-Internet movements. Net Art is "focused on the medium-specificity of new technologies," while Post-Internet responds to "the Internet as a feature of everyday life and an everyday feature of art," see: Tim Gentles, "Between Here and Nowhere: A Survey of Post-Internet Practices among New Zealand Artists," *Reading Room* 7.15: 112.

[48] Pers. comm. Chris Cudby, July 24, 2023. For an example from Paper Rad's now-defunct website, see: Paper Rad, archived version accessed at https://web.archive.org/web/20080902020003/http://paperrad.org/.

[49] On Web 2.0, see Tim O'Reilly, "What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software," *Communications & Strategies* 65 (2009).

[50] "Gravy Rainbow," YouTube, accessed November 3, 2023, https://www.youtube.com/watch?v=d-LKa1Y9_ok. For Daniel Tosh's blog posting, see: "WTFriday," Tosh.0 Blog, March 25, 2011, archived version accessed at https://web.archive.org/web/20110401160233/http://tosh.comedycentral.com/blog/2011/03/25/wtfriday-72/.

[51] Adam Harper, "Isn't it ironic?", *Dummy*, August 28, 2012, https://dmy.co/news/essay-isn-t-it-ironic.

[52] Michael Brown, *Eyeliner's BUY NOW* (New York: Bloomsbury, forthcoming).

[53] Crystal Magic Records issued around 60 releases between 2006 and 2015. They operated from July 2009 on Bandcamp and through their own website. For an interview with Fraser Austin and other CMR artists, see Emma Smith, "Crystal Magic," *Radio New Zealand*, July 5, 2014, https://www.rnz.co.nz/national/programmes/nat-music/audio/2602279/crystal-magic.

[54] "Rain" comes from the 2011 self-titled split release by Computer Dreams and Napolian (Beer on the Rug BOTR007).

[55] Quotation from the liner notes from *High Fashion Mood Music*.

[56] Jennifer C. Lena, *Banding Together: How Communities Create Genres in Popular Music* (Princeton: Princeton University Press, 2012).

[57] Laura Glitsos, "Vaporwave, music optimised for abandoned malls," *Popular Music* 37, no.1 (2018): 103.

[58] Georgina Born and Christopher Haworth, "From Microsound to Vaporwave: Internet-Mediated Musics, Online Methods, and Genre," *Music & Letters* 98, no.4 (2018): 634.

[59] See Ross Cole, "Vaporwave aesthetics: Internet nostalgia and the utopian impulse," *ASAP/Journal* 5, no.2 (2020): 297-326.

[60] Adam Harper, "Vaporwave and the Pop-Art of the Virtual Plaza," *Dummy*, July 12, 2012, https://www.dummymag.com/news/adam-harper-vaporwave/.
[61] Harper later explained the process by which he chose "vaporwave" in consultation with several of the artists involved. See: Adam Harper, "some chillwave differences," *Rouge's Foam*, August 4, 2013, https://rougesfoam.blogspot.com/2013/08/some-chillwave-differences.html.
[62] The Reddit vaporwave subreddit can be accessed at "r/Vaporwave," Reddit, accessed August 21, 2023, https:/www.reddit.com/r/Vaporwave/. For the Vapor Vault music archive, see "The Vapor Vault," Internet Archive, accessed August 21, 2023, https://archive.org/details/vapor-vault.
[63] See Scott Beauchamp, "How Vaporwave was Created then Destroyed by the Internet," *Esquire*, August 19, 2016, https://www.esquire.com/entertainment/music/a47793/what-happened-to-vaporwave/; and Ian Nordin "Vaporwave Might Be Dead, But Its Ghost Continues to Haunt Pop Music," *Study Breaks*, March 20, 2020, https://studybreaks.com/culture/music/vaporwave-ghost-influence/.
[64] See Ossiana Tepfenhart, "Coca-Cola Just Leaned into Its Vaporwave Aesthetic," *Medium*, August 16, 2022, https://medium.com/the-tasteful-toast/coca-cola-just-leaned-into-its-vaporwave-aesthetic-6b6e893c8cf.
[65] On factors that inhibit music genres progressing from being Scene-based to Industry-based, see Lena, *Banding Together*, 86-109.
[66] For the 4Chan thread which documents the assembling of this first vaporwave guide, see "/mu/ - Music," Desuarchive, accessed February 12, 2024, https://desuarchive.org/mu/thread/30167140/.
[67] See Dylan Kilby, "Guide to Vaporwave Guides," *Sunbleach*, December 2, 2017, https://sunbleach.net/2017/12/02/feature-guide-to-vaporwave-guides/.
[68] Pad Chennington, "Vaporwave Albums Tier List," YouTube, accessed March 12, 2023, https://www.youtube.com/watch?v=BzrCPIES9GY.
[69] In researching the early vaporwave community, I have relied on the 4Chan archives found at the website Desuarchive (https://desuarchive.org/). *HFMM* was first mentioned on the 4Chan /mu/ board in relation to vaporwave in a thread starting on July 13, 2012 (see: https://desuarchive.org/mu/thread/26405765/; and also a thread from several days later: https://desuarchive.org/mu/thread/26576853/).
[70] Harper, "Isn't it ironic?".
[71] Adam Harper, emails to author, October 14 and 17, 2023.
[72] For the sources of these snapshots, see: "Crystal Magic," Bandcamp, archived version accessed at https://web.archive.org/web/20120711052205/http:/crystalmagic.bandcamp.com/; and "High Fashion Mood Music," Bandcamp, archived version accessed at https://web.archive.org/web/20120827081057/http:/crystalmagic.bandcamp.com/album/high-fashion-mood-music.
[73] Rose Quartz, accessed July 24, 2023, http://rosequartz.blogspot.com/.
[74] For more information about the blogs aggregated to Altered Zones, see: "About," Altered Zones, archived version accessed at https://web.archive.org/web/20100924020352/http:/alteredzones.com:80/about. On the closing down of Altered Zones, see Devon Maloney, "Altered Zones, DIY/Indie Blog Collective Shutters after 16 Months," *Billboard*, November 20, 2011, https://www.billboard.com/music/music-news/altered-zones-diyindie-blog-collective-shutters-after-16-months-1159091/.
[75] For the post in its original format, see "Reflection," Rose Quartz, archived version accessed at: https://web.archive.org/web/20130506044242/http://rosequartz.blogspot.com/2012/07/reflection.html.

[76] For the post in its original format, see “情報デスクVIRTUAL,” Rose Quartz, archived version accessed at https://web.archive.org/web/20120504053119/http://rosequartz.blogspot.com/2012/04/virtual.html.
[77] Harper, email, October 17, 2023.
[78] Langley (whom Harper consulted for his “Virtual Plaza” article) seems to have also been crucial to propogating the term “vaporwave” on 4Chan. The first archived use of the term “vaporwave” on the /mu/ board is July 6, 2012, six days prior to Harper's article being published. That the poster (username: DNA on DNA on DNA !S0s79FtEKI) is Langley can be gleaned from her other posts (e.g., see this thread: https://desuarchive.org/mu/search/text/vaporwave/order/asc/).
[79] For the post in its original format, see “Cloudy,” Rose Quartz, archived version accessed at https://web.archive.org/web/20140702084347/http://rosequartz.blogspot.com/2011/09/cloudy.html.
[80] Barney Warf, *Time-Space Compression: Historical Geographies* (New York: Routledge, 2008), 194.
[81] This point raises the question of how historians of the future will interpret web archives once the Internet era they are researching passes out of living memory.
[82] Calculated from IFPI, *Global Music Report 2023*, 11.
[83] For the sources of these snapshots, see “Disasteradio,” Bandcamp, archived version accessed at https://web.archive.org/web/20161116051730/https://disasteradio.bandcamp.com/; and “Disasteradio,” Bandcamp, archived version accessed at https://web.archive.org/web/20210921050356/https://disasteradio.bandcamp.com/.
[84] An snapshot of the BOTR webpage from August 25, 2015, shows the edition of 150 cassettes had sold out in less than a month. See: Beer on the Rug, archived version accessed at https://web.archive.org/web/20150825014222/http:/www.beerontherug.com/.
[85] Bandcamp allows users to browse categories and filter these by popularity. Precisely how the algorithm works is not known, but the effect is to create a regularly updated “chart” based on release sales, presumably for the previous 6 hours, 12 hours, or such like. For snapshots of the “New Zealand”-tag “chart” around *BUY NOW*'s release date, see: Luke Rowell (@disasteradio), “I just found out the new Eyeliner has been #1 in New Zealand on bandcamp pretty much all week,” Twitter post, July 18, 2015, https://twitter.com/disasteradio/status/622161531384401920 (the accompanying image shows the album at no.1); “New Zealand,” Bandcamp, archived version accessed at https://web.archive.org/web/20150815033056/http:/bandcamp.com/tag/new-zealand (shows the album at no.7 on August 15, 2015). For snapshots of the “vaporwave”-tag “chart” around *BUY NOW*'s release date, see: “Vaporwave,” Bandcamp, archived version accessed at https://web.archive.org/web/20150708143916/https:/bandcamp.com/tag/vaporwave (no.2 on July 8, 2015); “Vaporwave,” Bandcamp, archived version accessed at https://web.archive.org/web/20150814003949/http:/bandcamp.com/tag/vaporwave (no.4 on August 14, 2015).
[86] On inclusion of Bandcamp sales in New Zealand music charts, see: “Bandcamp Statistics To Be Included In Official NZ Music Charts,” Under the Radar, December 2, 2016, https://www.undertheradar.co.nz/news/11944/Bandcamp-Statistics-To-Be-Included-In-Official-NZ-Music-Charts.utr.
[87] See “Eyeliner : Buy Now,” YouTube, accessed August 23, 2023, https://www.youtube.com/watch?v=6tYpkyy7Ogs.
[88] See “Music subscriber market shares Q2 2021,” MIDiA, accessed February 14, 2024, https://www.midiaresearch.com/blog/music-subscriber-market-shares-q2-2021.

[89] "Q2 2023 Update," Spotify, accessed December 13, 2023, https://s29.q4cdn.com/175625835/files/doc_financials/2023/q2/Shareholder-Deck-Q2-2023-FINAL.pdf.

[90] The snapshot for the 28 days prior to August 10, 2023, shows that around 50 percent of the audience were Millennials (born 1980-1995) and 44 percent were Generation-Z (born 1996-2010). These audience proportions can be compared with overall audience data available for the 2020 financial year, which shows that Millennials and Generation-Z make up some 69 percent of Spotify's free-tier users in the US. Source: Email from Kate Perry (Spotify Australia-New Zealand), September 2, 2023.

[91] Daniel Smith, "As Neil Young Boycotts Spotify, Local Artists Struggle to Earn Royalties From Platform," *Stuff*, February 20, 2022, https://www.stuff.co.nz/business/127736174/as-neil-young-boycotts-spotify-local-artists-struggle-to-earn-royalties-from-platform.

[92] See Rebecca Gilbin and Cory Doctorow, *Chokepoint Capitalism* (Carlton North: Scribe, 2022), 66-77; Meredith Rose, "Streaming in the Dark: Competitive Dysfunction within the Music Streaming Ecosystem," *Berkeley Journal of Entertainment & Sports Law* (forthcoming).

[93] Smith, "As Neil Young Boycotts Spotify."

[94] Naomi Zeichner, "Interview: Lorde," *The Fader*, August 8, 2013, https://www.thefader.com/2013/08/08/interview-lorde.

[95] Niels Brügger and Ian Milligan, "Introduction," in *SAGE Handbook of Web History*, eds. Niels Brügger and Ian Milligan (London: SAGE, 2018), xxviii.