FOUNDATIONS OF MOBILE MEDIA STUDIES: ESSENTIAL TEXTS ON THE FORMATION OF A FIELD

JASON FARMAN

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INTRODUCTION

Jason Farman

Our Mobile Lives

Globally, we are people on the move surrounded by objects and information that are also in constant motion. People get into cars or on trains and buses to get to work, especially as they move out of urban centers to the sprawl of suburbia. They travel in modes of transportation that pass by the homeless and displaced people who spend each day moving through the city. People cross national borders as tourists, as workers, and as refugees. There are migrations of people fleeing war zones or ecological crisis sites. Alongside the movements of human bodies around the world there is the movement of things: commercial goods, data and information, media, ideas, trash and waste, water, electricity, and a whole host of hidden infrastructural objects that make everyday life function.[1] John Urry has argued that "mobility, rather than society, may be the primary animating metaphor for sociology in the twenty-first century."[2]

In this context, our media have come to match this on-the-move life of the twenty-first century. We are mobile people and our dominant media are also mobile. As mobile phones have become globally pervasive, they exist alongside an array of other mobile technologies from wearables to smart watches, from tablets to RFID cards. "Mobile" applies to far more than just the phone. Defining the nature of these emerging mobile media has, as this field has emerged, required scholars and practitioners to thus be nuanced and granular in their understanding of the term "mobile." That is, assumptions cannot be made about what constitutes a "mobile" medium as opposed to a non-mobile medium. It is an increasingly complicated technological landscape.

Defining "Mobile" Media

Scott Campbell has pointed to the spectrum of use for media that has three points: fixed, portable, and mobile.[3] Historically, once a medium moves from a fixed location (for example a message written into the side of monument) to instead being an inscription on a mobile platform (ranging from clay tablets to paper to books), a mobile medium has been introduced into a culture. However, in our contemporary mobile and digital age, what is the difference between someone's laptop and their smartphone? Are both "mobile" media? They both are taken with a person as they travel on business, for example. Campbell's distinction here is found in everyday use and must be understood as a spectrum in which the line between categories bleeds over into each term based on context and the particulars of use. Do people use the medium while on the move such as while walking from place to place? Do they instead go to a location, such as a café or library, and "camp out" as detailed by Mizuko Ito, Daisuke Okabe, and Ken Anderson?[4] Within these examples, the media fall somewhere along the spectrum between portable and mobile. Further nuanced, each app on a smartphone could promote certain actions along this spectrum, some encouraging use that is on the move and some requiring users to stop and attend to the content. Jonathan Donner notes in chapter 7 of this book that "a full explication of the term *mobile media* may uncover presumed difference in form (text, music, voice, image, video), relationship (one to one, one to many, many to many), and permanence (real-time messages, asynchronous messages, stored/created content), with highly variable sets of conclusions as to what constitutes a mobile medium."

Another aspect that contributes to the difficulty with defining "mobile media" is the increasing miniaturization of the components within digital technologies. While some mobile phones are becoming increasingly larger and taking on the characteristics of tablets, the internal components are continuing to become increasingly small. The outcome of increasing miniaturization – sometimes credited as Moore's Law, in which Moore "observed that the number of transistors that could be placed on an integrated circuit had doubled every year since integrated circuits had been invented and predicted that that trend would continue"[5] – is that nearly all digital devices fall under the category of "mobile." That is, since many digital devices can be built in robust ways while still being small, we are surrounded by an ecology of seemingly mobile devices. For the emerging field of mobile media studies, this is a fruitful starting point to ask about our objects of study. Do we, essentially, study every mobile device that can be put into a backpack or pocket? While I have argued that such a perspective is useful, that our mobile phones exist among a whole host of mobile objects from identification cards to USB drives, it is extremely important to find the granular difference and specificities between these media.[6]

Making such distinctions between different types of mobile media can be a challenge, especially when attempting to create distinctions between digital communication devices and everyday mobile objects like identification cards. As digital

components are being inserted into identification, subway, and credit cards in the form of RFID tags, even mobile objects that appear to be "non-digital" are quite the opposite; they are mobile media that communicate with networks of data-bases.[7] The act of sending and receiving messages, of communicating using mobile media, is thus not restricted to the realm of human-to-human communication. Instead of mobile communication being simply defined as someone sending an image or video from their mobile phone, communication with mobile media also happens between these mobile objects as they communicate with each other.[8]

This stood out to me as I was about to give a talk at a mobile media company in the Washington, D.C. area. One of the employees of the company met me in the lobby of the building and led me to the elevator. He remarked to me that there were no card readers or access codes required to get onto the various floors of the building. "But," he noted, "look up at the ceiling of the elevator. Do you see that reflection of a screen light against the wall of the elevator?" I did. It was a bluish light being reflected against the metal walls of the elevator from a hidden device in the ceiling. "That's an iPad that is simultaneously communicating with the mobile phone in my pocket and the elevator. Without me doing anything, my phone authorizes my access onto the floor that we're going. It also authorizes us to walk into the doors in that part of the company, which are unlocked as I approach." Similar experiences are being engrained into our everyday lives, where the communication between mobile objects is a common part of our mobile landscape.[9] Thus, when we seek to distinguish between mobile communication devices we must ask who – or what – is communicating?

The study of the vast array of mobile media in our world has brought together scholars from various disciplines and various methodological approaches ranging from quantitative researchers to those who approach mobile media through a cultural studies lens. There has been a wide range of questions asked about the emergence of mobile media around the globe, all in the effort to uncover the varied nature of use from object to object and from region to region. The outcome, as can be anticipated, is that the term "mobile media" covers a huge spectrum of technologies in the early twenty-first century and that these media are used in vastly different ways depending on the context.

Thus, it can be argued that the mobile phone or tablet is itself not a medium but is instead a convergence point for a wide range of media. Put another way, my mobile phone is itself not a single medium, but through its various apps and various uses is the culmination point of an array of media practices that differ in significant ways. As mobile media studies continues to define itself as a field, this nuance becomes starkly apparent. Scholars who study mobile dating apps differ in the questions they seek to answer (and the methodological approaches used to find those answers) than those who study mobile finance and economic transactions using mobile devices. Those who study mobile games approach their objects of study differently than those who research mobile music and sound studies. Those who analyze wearable technologies bring different methods to their research than those who study the mobile internet. So, it is important to note how medium-specific

the scholars in this collection are and how they attend to their objects of study in the ways that best address the medium they are focusing on (and, of note, that this medium is not conflated with a mobile device).

What the scholars of mobile media studies have done over the last 20 years is to meaningfully connect the object of their study with the vast network of pressures that have exerted themselves onto the emergence of these media and how mobile technologies get used. In other words, mobile media studies scholars have been quick to note that these technologies do not exist in isolation; instead, they are always connected to other media, to cultural expectations, to technological histories, to politics, to market forces, among a whole host of other factors that are foundational elements of how mobile media take shape.

This book brings together several of the key authors and topics in this emerging field. The 15 chapters of this book demonstrate the strong methodological range of the field of mobile media studies, the array of objects studied (from historical precedents to transformations brought about through mobile photography), and the meaningful overlap between diverse scholars. Here, readers will notice that those who come from vastly different disciplinary backgrounds (and bring to the study of mobile media the methods drawn from their home discipline) are still very much in conversation with those in other fields. This, to me, signals the great strength of the field of mobile media studies: it is inherently interdisciplinary and thrives in the ways that scholars across disciplines work with each other. Though this small selection of foundational texts necessarily omits some of the most important scholars in this field, I hope that in each of these chapters readers will be able to identify the range of conversations that have been taking place over the past two decades and can use this book as the jumping off point into a deep dive of this important field of study.[10]

Structure of this Book

In chapter 1, "Making Voice Portable: The Early History of the Cell Phone," Gerard Goggin links mobile technologies to their historical origins. Beginning with the telegraph and moving through communication technologies like the telephone, radios, and pagers, Goggin historicizes the emergence of handheld mobile devices and thus works against a sense of "new" media that often overwhelm the discussions of our contemporary mobile devices. The shape our devices take at this present moment is deeply tied to historical precedents of communication technologies as well as the cultural contexts in which each of the media emerged.

Chapter 2, "Theorizing Mobile Communication in the Intimate Sphere," by Rich Ling, builds on Goggin's historical analysis of the mobile phone to look at the history of the spatial aspects of these media. That is, Ling explores how our cultural relationship to place has shifted with the move to suburbia (as one example), and the ways that mobile media emerged to fill certain communication needs of dispersed populations and communities. As practices of coordination have transformed along with the shifting notions of the local, communication

technologies like the mobile phone have become vital nodes in the practice of human intimacy and social cohesion. As people and communities have become increasingly mobile, we have faced what Ling terms a "coordination gap," one that is addressed by the mobile phone. In this chapter, he details the emergence of this gap and how mobile technologies have given us "the same relatively direct access to our immediate social circle that we had lost with the coming of the car and the expansion of the city. It was at this point that we could again, figuratively, shout out across the yard to our partner should we need to talk to them."

Chapter 3, "New Technologies, New Mobilities," by Anthony Elliott and John Urry, explores the key trope of "mobility" that has come to define our lives in this era. Extending the work of Ling in chapter 2, Elliott and Urry note that mobile media aren't solely about sociability; instead, mobile media are technologies that link with our individual emotional lives and practices of identity. Mobile lives, they argue, are "not simply about an increased digitization of social relationships, but a broad and extensive change in how emotions are contained (stored, deposited, retrieved) and thus a restructuring of identity more generally." Looking at factors of mobile media such as miniaturization, ability for instant communication, the weaving of technology into the unconscious realm of our lives, and the "non-human" object relationships to these media, this chapter lays important foundational groundwork for how we understand mobile media as individuals in a world of technological objects.

Chapter 4, "Mobilizing Place: Conceptual Currents and Controversies," by Rowan Wilken and Gerard Goggin, offers an exhaustive overview of the key stakes in mobile media studies around the notion of "place." For their approach to the study of mobile technologies, place is a key term that relates to nearly every approach to the study of mobile media. They write, "Because these are technologies in which mobility is key, there has been an everyday concern with their relationship to particular places (e.g., the space occupied by an individual while they use a device) and place in general. As mobile technologies have developed, their links with, focus on, and reliance on place have only deepened." Pointing to examples ranging from mobile mapping platforms to the ways mobile technologies make a place meaningful, they point to the important relationship between mobile media and notions such as spatial significance, the material components in a space, and everyday practice. Out of these concerns, they explore how researchers have approached the intersection of technology and place looking at topics such as globalization (within which mobile media serve as "a kind of fault line along which place is, depending on one's point of view, either unsettled or reconstituted"), embodiment, and presence.

Chapter 5, "Reappropriating Social Media," by Therese Tierney, offers an example of such transformations of space brought about through mobile social media: the uprisings of the Arab Spring and the Occupy Wall Street movement. Noting that "[s]patial publics and networked publics are neither separate nor competing spheres," this chapter looks at how these emerging hybrid spaces offer new forms of social protest. These protests using mobile media are effective,

Tierney argues, because they help organize groups in locations where the "free press is limited or nonexistent." She continues: "Whether mundane or revolutionary, social media creates a distributed community, not in its material culture, but in the creative practices of knowledge sharing and the acknowledgement of that collective awareness." As such, these "distributed knowledge communities," which use mobile social media, "can empower minority or marginalized groups by providing a forum in which to voice their objectives." Tierney subsequently analyzes the emerging surveillance practices that crop up in response to these cyber-activist approaches to mobile media use, especially in the ways that "[i]ncreased accessibility to networked publics has proceeded in lockstep with an equivalent loss of privacy."

Chapter 6, "Walking Phone Workers," by Lisa Parks, analyzes the unique global practices of mobile phone use, noting that we need to understand "mobile telephony not as a uniform infrastructure that is plopped down on earth . . . but rather as a technologized system of distribution that takes a unique shape and form in relation to the historical and socio-economic conditions that surround it." To explore this complicated system, she looks as Mongolian phone workers who purchase or lease mobile phones and then charge passersby on the streets to use the phones. This new form of labor addressed a population in which more than one-third of the citizens live in poverty and thus paying a one-time fee for phone use is economically possible where mobile phone ownership is not. Parks situates these mobile phone workers among the long history of communication infrastructures in Mongolia, the emerging transnational economies that impact the country, and the social mores of phone use in the region. For example, these mobile phone workers began wearing surgical masks in 2004 during the SARS scare and the fears of the transmission of this respiratory syndrome in the urban settings like those occupied by the phone workers. Parks explores how these surgical masks continued to serve as a way to identify the phone workers on crowded city streets long after the SARS scare, as well as support the cultural ideas of privacy by concealing the phone operator's face. The phone operator thus temporarily blends in "with the system to produce a privacy effect for the caller." Thus, the phone workers offer an investigation into the rich heterogeneity of mobile phone practices, cultural specificities, and infrastructures; notions that "are certainly not the same all over the world: they are amalgams of old and new systems, relics of various stages of capitalism and/or socialism, involve both bodies and machines, and have different histories and uses."

In chapter 7, "Mobile Media on Low-Cost Handsets: The Resiliency of Text Messaging Among Small Enterprises in India (and Beyond)," Jonathan Donner continues this line of inquiry by noting that, in contrast to a "focus on the leading-edge . . . elegant applications in the hands of technological savvy users, running on advanced devices and over fast networks in the centers of global digital innovation," it is instead necessary to give attention to the low-cost, feature phones like the Nokia 1100. These low-cost handsets "are still the leaders by volume" in the developing world. Analyzing how these particular devices are used, Donner focuses on text messaging, noting that "[t]ext messages are the most popular nonvoice

communication activity" and among these users "[p]hotos, e-mail, and the Web barely register" as frequent uses of their mobile devices. Exploring the global context of emerging internet-connected devices and the rise of app culture, he examines the ways that text messaging has embedded itself as a core use of mobile phones and to the reasons that the humble text message "will remain, resilient and persistent, longer than we might imagine."

In chapter 8, "Domesticating Cartographies: Gendered Mobile Media in the Region," Larissa Hjorth explores what she terms "cartographies of personalisation" and how gendered practices of mobile media (and mobility) arise in the Asia-Pacific. Hjorth looks specifically at ways in which the female consumer has become a symbol for transnational communities, of post-industrial identity as it is formed across borders, and of the postmodern technological user. She writes that the mobile device is "a vehicle of hyperfeminisation that exploits women as both consumers and producers in the hypermasculine logic of post-industrial capitalism." The effects of this "hypergenderisation" is experienced differently in various regions of the Asia-Pacific and Hjorth analyzes the nuances in the emerging landscape of mobile labor, socialization, and identity.

In chapter 9, "These Foolish Things: On Intimacy and Insignificance in Mobile Media," Kate Crawford extends the discussions of intimacy in the previous chapter by linking the term to practices of everyday life. Specifically, Crawford is interested in the ways that intimacy is forged through the "sharing of everyday actions, habits, and experiences – everyday 'trivia'" and the "insignificant" chatter that is often exchanged through mobile social media. Drawing on the range of research studying mobile communication and how mobile "conversations and texts are less about relaying vital information and more about sharing experiential moments," she argues that "'[c]onversations about nothing' are cementing forms of social connection and intimacy, building and developing over time." Countering the many tirades against mobile technology that argue that the medium encourages banal interaction, Crawford uses Twitter as her object of study to show how the "disclosure of simple, easily described moments" instead create social cohesion built around "care work, bonding, and intimacy that are created and maintained" through short mobile interactions that accrue over time.

An analysis of reading in the age of mobile media has often confronted the issues discussed by Crawford and created divisions among researchers about the overall effects on the human consumption of texts. In chapter 10, "Does Mobile Matter? The Case of One-Off Reading," Naomi Baron takes on this issue by beginning with three key considerations: 1) content versus container (i.e. the meaning of the text versus the medium through which the text is conveyed); 2) physiological and cognitive dimensions (i.e. how the physical act of reading is altered and how the medium impacts absorption and retention); and 3) user reading preferences. Laying this groundwork, Baron looks at the specificities of text, reader, and situational context to analyze how mobile technologies are affecting the act of reading. She looks at deep reading of long-form texts and its counterpart: "one-off reading" designed to quickly obtain information and not return to the text a second time.

She looks at one-off reading from easily consumable entertainment books of the 1800s meant to be consumed while traveling to current undergraduate texts that are consumed in ebook format. She concludes by exploring the ways that digital media may encourage certain forms of reading over others and, ultimately, argues for researchers to historicize this question. She notes, "The trend away from intensive (multiple) reading to extensive (one-off) reading traces back several centuries. . . Reading patterns – and pedagogical directions – also evolve." Mobile media, she argues, encourage one-off reading through their portable nature, yet these trends have deep links back to the larger histories of texts and their mobility.

In chapter 11, "To Each Their Own Bubble: Mobile Spaces of Sound in the City," Michael Bull lays out the emerging interaction between personal listening devices and the transformation of urban soundscapes. From people using headphones plugged in to mobile listening devices to take control of the urban soundscape (creating their own soundtrack to replace the noise of city life) to listeners cocooning themselves from crowded public spaces, mobile devices are creating audio "sound bubbles" as they move through life. Bull explores these shifts through examples like the sound system in an automobile, the reconfiguration of space through a personal stereo and a pair of headphones, and voice conversations on a mobile phone as a way to link an unfamiliar place with a familiar voice. The soundscapes discussed in this chapter transform social spaces while they also often link listeners across places as a strategy of "placing themselves 'elsewhere' in urban environments."

In chapter 12, "Locational Privacy," Adriana de Souza e Silva and Jordan Frith explore the implications of location and site-specific uses of a mobile device on the definitions and practices of privacy. They begin by noting, drawing from the work of Daniel Solove, that contemporary definitions of privacy are either too broad or too narrow. Notions of privacy instead need to be understood contextually; however, a major hurdle to this evolving approach to privacy is that users are often woefully unaware of the amount of data that they generate, where that data is stored, and who has access to this information. Taking these concerns as a springboard into an analysis of mobile and locative privacy, they note that such concerns are relatively recent, emerging with the rise of databases and location-tracking technologies. Location tracking emerged with mobile technologies prior to the ubiquitous use of GPS; the early "Enhanced 911" emergency call system in the United States tracked user location through cell tower triangulation. As location tracking and privacy converge around increased ability for a person to be located with their mobile device (and all that a person's location can reveal about their identity), de Souza e Silva and Frith explore the discourses around locational privacy as it is "generally associated with fears of surveillance: 'top-down' forms of surveillance in the case of governmental and corporate surveillance, and 'collateral' surveillance, in the case location is disclosed to other people." They conclude by offering a nuanced perspective into the issues surrounding locational privacy, and launch into this approach by noting that privacy is complicated since "most things are neither strictly private nor strictly public. . . privacy depends on context."

Location, they argue, such as a person sitting in a coffee shop, is not inherently private since a person may inform friends of his or her location or, at the very least, be seen by others in this place. "However," they continue, "people do expect to have some degree of privacy and anonymity even when in public spaces. . . Just because location is not inherently private, it does not mean that it is completely public. Therefore, locational privacy needs to be understood contextually."

In chapter 13, "When Urban Public Places Become 'Hybrid Ecologies': Proximity-Based Game Encounters in *Dragon Quest 9* in France and Japan," Christian Licoppe and Yoriko Inada look at locative media through the lens of gaming encounters in public places. Using proximity-based mobile games that connect players who are within a certain distance of each other (for example, *Dragon Quest*, a player can connect if they are within 20 or 30 meters of each other) as an entry point to analyze the transformation of public places into "hybrid ecologies," Licoppe and Inada explore the kinds of social practices that emerge when digital media and physical spaces encourage encounters with strangers. Drawing on in-depth qualitative fieldwork with players of *Dragon Quest*, Licoppe and Inada studied the ways that locative, proximity-based games required the "management of multiple identities and the construction of layered participation frames." Within this management, players openly work to navigate the encounters with non-playing strangers, in-game strangers, and the expectations of the public space. As players work to achieve "civil inattention" in order to remain relatively anonymous in the public space (notably disassociating their in-game identity with their in-person identity), Licoppe and Inada argue that such practices may soon characterize social encounters in emerging cities that are replete with ubiquitous computing: "Such a form of 'hybrid civil inattention' could therefore become a specific feature of mediated encounters in large and heavily 'augmented' cities."

Moving from mobile games to mobile television, chapter 14, "*24: Conspiracy* and the Mobile Phone: Immersion and Immediacy," by Elizabeth Evans, explores transitions in entertainment media and consumption in the age of the mobile device. By looking at the uses of the mobile phone for transmedia storytelling and engagement (in which the content that might begin on a television show links in meaningful ways to content on a mobile device, the internet, and other emerging platforms), Evans looks specifically at an early mobile television project through the content produced for *24: Conspiracy*. This transmedia television experience was launched in 2005 as a way to extend content from the fourth season of the show *24*. This transmedia mobile story extended the narrative strand of the *24* series, offering new narrative strands for the participants. Addressing the medium-specificity of a mobile device for storytelling, she links the issue of screen size to the "false contrast" between cinema and television (echoes of which are obvious when discussing the differences between television and mobile devices). While television developed its own expectations as a medium independent of its cinematic heritage, so too could mobile television become unique in the content it produces. However, the cultural expectations of these media often result in the ways media makers design for these technologies: "When a televisual product is placed on a platform

that is perceived as hindering the ability for television to be visual, [audience members] are disinclined to engage with it." Extending the conversation of the assumptions of particular platforms, Evans looks at mobile television's confrontation with public space, immersion, and immediacy. In the end, this chapter captures this particular moment in technological history and the cultural assumptions around the ways that content is created for television and for mobile media: "Although there is the potential within these groups to have more positive opinions of the mobile phone as an alternative for specifically non-dramatic content, as far as television drama is concerned, the audience is still firmly focused on the box in your living room and not the box in your pocket."

The book concludes with chapter 15, "Between Image and Information: the iPhone Camera in the History of Photography." Here, Chris Chesher points to the ways that mobile phone photography "has become a disruptive technology in amateur photography" within the context of the "historical changes in the tech-nosocial configurations of mass amateur photography." Chesher argues that the mobile phone camera's ability to link a broad range of uses – such as "instant digital manipulation, pattern recognition, augmented reality and even medical monitoring" (or even, he notes, simply serve to create an office document or "use the image as pure information") – transforms the very act of taking a photograph and the object produced. Theses transitions are linked to a long history of public photography and this chapter traces these links across a range of technologies such as the Kodak Brownie, the early versions of digital cameras, cameras on feature phones, and the first iPhone camera. Within the app ecosystem, references back to nostalgic forms of instant photography, as achieved through apps like Hipstamatic and Instagram, create social exchanges that build on the previous models of instant image creation and distribution. Moving beyond image creation, the mobile phone camera's potential for information gathering and distribution will continue to transform the role of imaging for "individual and collective sense of identity, place and memory."

Notes

1 Such concerns are the core of the study of "mobilities," a partner field to mobile media studies that focuses on the trope of movement, cultural shifts related to being mobile, and the infrastructures and technologies associated with mobility. See, for example, emerging scholarship published in the journal *Mobilities* as well as foundation texts like Peter Adey, *Mobility* (New York: Routledge, 2009); Mimi Sheller and John Urry, *Tourism Mobiities: Places to Play, Places in Play* (New York: Routledge, 2004); John Urry, *Mobilities* (Cambridge: Polity Press, 2007).
2 In Paul Dourish and Genevieve Bell, *Divining a Digital Future: Mess and Mythology in Ubiquitous Computing* (Cambridge, MA: The MIT Press, 2011), 119.
3 Scott Campbell, "Mobile Media and Communication: A New Field, or Just a New Journal?" *Mobile Media & Communication* 1, no. 1 (2013): 8–13.
4 Mizuko Ito, Daisuke Okabe, and Ken Anderson, "Portable Objects in Three Global Cities: The Personalization of Urban Places," in *The Reconstruction of Space and Time*, ed. Rich Ling and Scott W. Campbell (New Brunswick, NJ: Transaction Press, 2009), 67–88.
5 Paul Ceruzzi, "Moore's Law and Technological Determinism: Reflections on the History of Technology," *Technology and Culture* 46, no. 3 (2005): 584.

6 See Jason Farman, *Mobile Interface Theory: Embodied Space and Locative Media* (New York: Routledge Press, 2012): 1–3.

7 Jordan Frith, "Communicating Behind the Scenes: A Primer on Radio Frequency Identification (RFID)," *Mobile Media & Communication* 3, no. 1 (2015): 91–105.

8 Jason Farman, "The Materiality of Locative Media: On the Invisible Infrastructure of Locative Media," *Theories of the Mobile Internet: Materialities and Imaginaries*, ed. Andrew Herman, Jan Hadlaw, and Thom Swiss (New York: Routledge, 2015), 45–59.

9 These kind of interactions are the fruition of what Mark Weiser named "ubiquitous computing" in the late-1980s and early-1990s. See Mark Weiser, "The World is Not a Computer," www.ubiq.com/hypertext/weiser/ACMInteractions2.html and Mark Weiser, "The Computer for the 21st Century," www.ubiq.com/hypertext/weiser/SciAmDraft3.html

10 For an exhaustive gathering of key texts in the field thus far, see *Mobile Technologies, 4-Volume Set*, ed. Gerard Goggin, Rich Ling, and Larissa Hjorth (New York: Routledge, 2015).

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1

MAKING VOICE PORTABLE: THE EARLY HISTORY OF THE CELL PHONE

Gerard Goggin

New Take-Along Telephones Give You Pushbutton Calling to Any Phone Number … Fishing offshore, driving home from work, or riding horse-back – this phone user could place and receive calls anywhere …

(Motorola's DynaTAC gracing the cover of Popular Science *magazine, quoted in Murray 2001: 22)*

Have we reached the day and age when a key accessory in every schoolkid's pocket is a mobile phone?

(Gibson 1997)

While it took the domestic telephone approximately thirty years to migrate from an instrument most often in the hallway of the home in the 1960s, to its ubiquitous position today in the living room, kitchen and bedroom, the mobile telephone found it way into our pockets in less than half that time.

(Lacohée, Wakeford, and Pearson 2003: 203)

In the nineteenth century, the telegraph emerged as a communication technology with pervasive implications for the spatial organisation of society, but also how news, information, and entertainment were circulated (Blondheim 1994; Coe 1993; Hubbard 1965; Kieve 1973); in short an important predecessor to the cell phone. There was a close relationship between the telegraph and the railways, both important technologies and infrastructures for communication; one communicating signals, codes, and messages; the other communicating people, goods, materials, and texts. With the first working mechanical telegraph created by the Chappe brothers in the 1790s, and the first telegram sent in August 1794, by the middle of the nineteenth century the telegraph had approximately 5000 km of line with 354 stations across France (Solymar 1999: 22–31). The French's antagonists in the Napoleonic wars, the British, responded with an extensive shutter telegraph system

by the time of the Treaty of Paris in 1814 (1999: 34–8). The first commercial electric telegraph, devised by Cooke and Wheatstone, was in operation by 1839, providing communications for railway operations (1999: 52–3; Hubbard 1965). From 1840 to the late 1860s, telegraphy expanded greatly, especially with the laying of submarine channels, pioneered, like commercial telegraphy, by Britain (Headrick 1991: 11–49). By the end of the nineteenth century the telegraphy had become a truly global communications network, intimately involved in the intricacies of global trade and war, colonialism and the intensification of imperialism (Headrick 1991: 50–72) no less than nationalist movements (Livingston 1996).

In the closing years of the century, a new communications technology was developed which displaced the telegraph, and gave today's modern industrialised cities their nervous systems – the telephone. The appearance and rise of the telephone is especially associated with the United States, the scene of Alexander Graham Bell's famous 1877 demonstration, involving songs and conversation between himself located in a Salem lecture hall and his assistant Watson in nearby Boston: 'As I placed my mouth to the instrument it seemed as if an electric thrill went through the audience, and that they recognized for the first time what was meant by the telephone' (Bell quoted in Bruce 1973: 217). The dominant telegraph company Western Union was initially not interested in the new invention, but then did enter the telephone business until their 1879 loss to Bell in a protracted patent case. Bell and his partners continued to defend vigorously its patent rights as well as to consolidate its business, founding American Telephone and Telegraph Company (AT & T) in 1885 (Bruce 1973: 258–87; Garnet 1985; Smith 1985). Eventually, after a period of widespread competition from 1884 to 1912, AT & T was able to achieve legitimacy for its eventual regulated monopoly status under the catch-cry of its president Theodore Vail of 'one system, one policy, universal service' (Mueller 1997).

Though the invention of the telephone was famously credited to Alexander Graham Bell, a number of other individuals and companies around the globe also developed important innovations in this technology. The telephone was an instrument that allowed sound to travel along wires, and so people to use telephones to speak to each other. Telephones were installed in a home or office, and connected by lines – copper wires – to the telephone system. The phone system connected individual subscriber telephones through switches. Initially one picked up the phone, and an operator answered and made the connection with the desired number, opening a circuit between the two telephones for voice communication. Eventually the switching process was automated, electromagnetically, and then become digitalised (that is, through digital technologies and computer software). The term 'telecommunications' was coined in 1932 to designate voice telephony, but also referred to other sorts of communications at a distance over networks. Connected by wires to their networks, telephones were inset in their places in houses, offices, or public payphones. However, the dream of ease of communication in different places, or while on the move, was long nourished.

After all, new sorts of mobility had emerged in the late nineteenth and early twentieth centuries, as represented by conveyances such as the automobile.

By 1914, the number of telephone subscribers in the USA had reached 1 per cent of the population, well outstripping most European countries in this period except Sweden and Denmark (Solymar 1999: 111–13). The first reliable figures show that there were 10 million telephones in use worldwide in 1910, with the USA accounting for almost 70 per cent of these: 'The worldwide number of telephones reached the 20 million mark in 1922, the year that Alexander Graham Bell died, the 50 million mark in 1939, and 75 million in 1950' (Huurdeman 2003: 228–9; citing AT & T's *Telephone Statistics of the World*).

There is much to say about the development of the telephone, how communicative and cultural practices and norms emerged, and how voice communication at a distance became an important part of daily life. What I wish to reflect upon briefly are the imagined and actual uses of this novel instrument. It is worth noting that there was a multitude of emotions, affects, and ideas about the telephone, and telephonic communication, both hundreds and thousands of years before its materialisation, but also in the early years before its now customary identity reached a stable form.

Claude S. Fischer's social history of the telephone in the United States bears out that in 'several ways, the telephone industry descended directly from the telegraph industry' (Fischer 1992: 81); for example, key figures in the development, building, and marketing of the telephone industry were formed in the telegraph industry, and many companies involved also shared this lineage. The importance of this lay in the early uses those championing and financing the telephone imagined for this instrument. According to Fischer, the uses conceived by marketers very much revolved around the business uses, modelled on the example of the telegraph: 'the uses for the telephone these men first proposed and then repeated for decades largely replicated those of a printing telegraph: business communiqués, orders, alarms, and calls for services' (1992: 81). Businessmen were the first target of the marketers, as in its 'earliest years the industry paid only secondary attention to marketing residential service' (1992: 67). When the industry did seek to persuade households of the benefits of telephones, it 'emphasized the "business" of the household, the ways in which the telephone could help the affluent household manager accomplish her tasks' (1992: 67).

In contrast the telephone industry did not in general, in the USA at least, envisage or encourage what became one of the most important uses of the telephone: namely, its use for sociability. Early on, for instance, the telephone was used for social and familial contact, and relationships, for 'visiting'. Fischer suggests that:

> Industry leaders long ignored or repressed telephone sociability … because social conversations did not fit their understanding of the technology. Feeding these attitudes, no doubt, was the common perception that women made most social calls and their conversations were not serious. That view, in turn, may have reflected a general close-mindedness towards people different from

themselves. Many early telephony company officers, in correspondence or other comments, dismissed immigrants, blacks, and farmers as people who could not use or perhaps could not comprehend the telephone. The dissidents were the ones who suggested that such people … were plausible customers.

(1992: 81)

It was not until the 1920s that the use of the telephone for sociality, and its place as in the private, domestic sphere of the household, become an important, accepted focus. The history of the uses of the telephone discerned by Fischer offers instructive lessons for thinking about its mobile successor:

the promoters of a technology do not necessarily know or decide its final uses; that they seek problems or needs for which their technology is the answer, but that consumers themselves develop new uses and ultimately decide what will pre-dominate … vendors are constrained not only by its technical and economic attributes but also by an interpretation of its uses that is shaped by its and their histories, a cultural constraint that can persist over many years.

(1992: 85)

There are other forces at work, of course, in the social and cultural shaping of the telephone, as with other technologies. An important dynamic is the relationship between representations of technology (not least images, dreams, and fantasies), and embodied practices and uses. Carolyn Marvin provides an important account of discourse about the telegraph, telephone, and electric lamp in Anglo-American culture in the late nineteenth century, and how these new communicative devices and the imagining of their possibilities function as 'vehicles for navigating social territory in the late nineteenth century' (Marvin 1988: 8). For Marvin, this is evidence of the 'process of social adjustment around new technology' (233) and the 'history of continuous concern about how new media rearrange and imperil social relationships' (235).

There is a great deal more to be said about how the telephone developed its cultural and social arrangements, and vitally important rituals, practices, vocabularies, and meanings. What I wish to end this passage of the argument with here, however, is a famous instance of the use of the telephone for broadcasting in the early period before it had been enshrined as a voice communication medium (first with party-lines on which conversations could be easily overheard, then ultimately with secure two-way, dyadic conversations). Pioneering attempts to use the telephone for broadcasting entertainment in Britain and the USA were not profitable, but a viable and relatively popular enterprise that did offer such a service was the Telefon Hirmondó in Budapest (Hirmondó being a Magyar word for the medieval town crier). Established in 1893, Telefon Hirmondó involved the transmission of daily programming of various sorts of news and announcements as well as concerts,

attracting sizable audiences of telephone subscribers over the next two or more decades (Marvin 1988: 222–31). Compared to other telephonic experiments in broadcasting events or entertainments (what Marvin terms 'occasions'):

> The Telefon Hirmondó was a hybrid of newspaper practices, conventional modes of oral address, and telephone capabilities that anticipated twentieth-century radio … In its time it was seen as a novel newspaper form, but it was radically forward-looking in its continuous and regularly scheduled programming, the origination of some programs from its own studios, and the combination of news and entertainments in the same service.
>
> *(1988: 231)*

Such alternative histories and uses of the telephone not only have important resonances and resemblances for thinking about later developments in broadcasting such as cable or pay television, as Marvin reminds, but also prefigure possibilities of the cell phone beyond a portable device for voice telephone conversations.

Making voice communications portable

If histories of media have their difficulties, there are peculiar challenges and characteristics in seeking to formulate histories of the newer media (Flichy 2002). This is certainly the case with doing the histories of the cell phone. Despite its relatively recent commercial availability and consumer adoption from the early 1980s onwards, the cell phone has been in development for at least fifty years. It also recursively adopts and reconfigures habits, expectations, and cultural forms from the telegraph and the telephone, these two other technologies central to modernity I have just briefly reviewed.

One particular difficulty in writing histories of telecommunications is that, while there have been many institutional, technical, or national histories of telecommunications, studies that take the social and cultural dimensions of telecommunications are relatively scarce compared to a wealth of literature on other media (notable exceptions include Fischer 1992; Marvin 1988; Sconce 2000; the history of telecommunications also features in Winston's important 1998 history of media technology). As for work on cell phone and mobile technology history, this is very much in its infancy. There is one lively and accessible book devoted to the subject (Agar 2003), coverage of the subject in a number of other books (for example, Steinbock 2003), an evolving website on the topic (Farley 2005), special issues of journals devoted to the history of the technical and standards development of mobiles (such as Lehne 2004; Lyytinen and King 2002), and the histories and politics of mobiles (Goggin and Thomas 2006), as well as suggestive treatments in various articles and collections on social aspects of the mobiles (Goggin 2006; Hamill and Lasen 2005; Ito, Okabe and Matsuda, 2005; Katz 2002 and 2003; Lacohée, Wakeford and

Pearson 2003; Ling 2004). Given this relative dearth of material, I will discuss some of the features I think are important for understanding cell phone culture.

As a form of radiocommunications, the beginnings of the cell phone are found in the extraordinary career of Guglielmo Marchese Marconi, who dominated the early development of radio. The young Italian brought his wireless telegraphy instrument to England in 1896, patenting his invention and founding his own company the next year (Baker 1970; Huurdeman 2003: 207ff). Marconi also developed the use of wireless telegraphy in maritime communications, with clever, if anti-competitive tactics, to ensure ships adopted Marconi sets and operators (by requiring operators not to communicate with wireless operators of other companies) until this policy was countermanded by a resolution of countries participating in the new International Radiotelegraph Conference (Huurdeman 2003: 232; 357–8; Solymar 1999: 134–6). The sinking of the Titanic on 14 April 1912 underscored the importance of wireless telegraphy at sea, and it led to the next Conference where sweeping regulations were put in place because of failures to heed radio warnings (Huurdeman 2003: 282–3). In 1919–22 there was a trial of radio-telephony to ships as an extension to the existing Bell Telephone System, followed by the commencement of public telephone service to ships on the Atlantic Ocean in 1929 (Huurdeman 2003: 284).

Portable and transportable telephones had already been developed on land in the late 1890s. They were used by telephone companies to test lines, as well as by armies in battle (in the Boer War, for instance) (Attman et al. 1977; Steinbock 2003: 73). Marconi is credited with the first mobile car radio: 'A steam-driven wagon was equipped with a transmitter, a receiver, and a cylindrical antenna about 5 m high mounted on the roof' (Huurdeman 2003: 285, 287; Michaelis 1965: 133). In 1909 the US Army Signal corps experimented with radio equipment mounted on horse carriages, and '[m]ilitary mobile and transportable radiotelegraph equipment was used widely during World War I' (Huurdeman 2003: 286). In 1911, Lars Magnus Ericsson, eponymous founder of the famous Swedish tele-communications equipment manufacturer, and his wife Hilda, tried to develop a car phone: 'Hilda used two long sticks, like fishing rods to hook them over a pair of telephone wires. Lars Magnus cranked the dynamo handle of the telephone, which produced a signal to an operator in the nearest exchange' (Steinbock 2003: 73). As Agar remarks:

> When Lars Magnus Ericsson was driving through the Swedish countryside, he still had to stop his car and wire his car-bound telephone to the overhead lines. If he had pressed his foot on the accelerator, the wire would have whipped out, wrecking the apparatus.
>
> *(Agar 2003: 16)*

The first radio telephone was that used by Bell Laboratories in 1924 (Steinbock 2003: 73). Land mobile use, however, was not pioneered by the American

telephone company AT & T; rather it was the Detroit Police Department that did so in 1921, for police car despatch. Patrolmen would be paged, and once alerted they would need to find a wireline telephone to call back (Steinbock 2003). By the early 1930s in Detroit, New York, and elsewhere, police cars were regularly using one-way mobile radio communication. A leader in car radio communications was Galvin Manufacturing Corporation in Chicago, which designed a less bulky two-way radio for the mass market in 1931. Galvin called the radio 'Motorola', and this was how the company was renamed also in 1947 (Huurdeman 2003: 286). In 1933, the first two-way radio communications were established in New Jersey. This was at a time when radios in automobiles were becoming popular and the Frequency Modulation (FM) band was devised. Motorola officially entered into police radio communications in 1937, quickly becoming the market leader, with emergency services, government agencies, and essential services using two-way land–mobile radio (Noble 1962; Steinbock 2003: 78–9).

New technical advances in wireless communications came during World War II, with the design and manufacturing of two-way radio sets for the American forces by General Electric and Motorola, in particular the latter's 'Handie Talkie' (or Walkie-Talkie), the first portable radiotelephone launched in 1943 (Huurdeman 2003: 286). After the war, civilian organisations took up the new radio technology, especially taxi cabs for despatch, and by 1952, 350,000 two-way private mobile radios were in use, usually for brief calls or communication (Steinbock 2003: 82–3). The first commercial mobile radiotelephone service in the USA was offered in 1946 in St Louis, Missouri, by AT & T and Southwestern Bell, allowing calls from fixed phones to mobile users. Even in its improved version, the service had relatively poor voice quality and was quite inefficient in its use of radio spectrum. Another system was introduced in 1956, which had almost 1.5 million users by 1964, when AT & T introduced an 'Improved Mobile Telephone System':

> Operation was in a manual mode; an operator could establish a call between two mobile subscribers or between a mobile subscriber and a subscriber on the PSTN. The mobile terminals equipped with electronic vacuum tubes were large, heavy, had high power consumption, needed shock-protected mountings, and were expensive.
>
> *(Huurdeman 2003: 519)*

Making more productive use of mobile radiocommunications by dividing spectrum into cells, what was to prove a vastly more efficient and reliable method of mobile communications, was an idea first devised in the Bell Laboratories in 1947 (Farley 2005; Lucent Bell Labs 2004).[1] Transmission of signals was organised around a grid of interlocking, polygonal cells, rather like the honeycomb of bees. A phone would send and receive signals via the transmitter tower that provided dedicated service to the cell in which it was located. When the user moved location and passed from one cell to another, the responsibility for maintaining the