

F.H. Collins. Illustration from patent application for Magneto Ear Phone, U.S. patent 622,328, issued April 4, 1899.

# Pocket Wireless and the Shape of Media to Come, 1899–1922

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One of the most striking things about the writing on wireless telegraphy immediately following its public unveiling at the America's Cup races of 1899 is the extent to which journalists, engineering professionals, and storytellers focused on what the device could not do. Admittedly, the capabilities of “wireless” as Guglielmo Marconi first developed and pitched it were limited. A technical precursor to radio, wireless telegraphy could transmit on one wavelength only, effectively carving out a bubble within which any other signal would simply produce noise. Similarly, Marconi's wireless was not at all selective in its reception of incoming signals, thus picking up a variety of both natural and manufactured frequencies. Surviving paper tapes that carry messages inked in Morse code from the Marconi wireless show not a clear series of dots and dashes but “either a semicontinuous line, occasionally broken up at arbitrary points along the tape, or gibberish—lines that were neither dots nor dashes.” While telegraph operators were trained to tap out messages across the wires with blazing speed, wireless “key work” necessitated depressing the key a full five seconds for *dot* and fifteen for *dash*.<sup>1</sup> It was this highly provisional version of wireless telegraphy that the press responded to. But such limitations did not keep either the more informed skeptics in technical publications or the starry-eyed wireless fanatics in mass circulation newspapers from thinking seriously about the potential of information transmitted through the air. A series of technical and narrative mechanisms rushed in to explain away the rough spots in wireless's limited capabilities as it was first exhibited, sparking a conversation on the shape of wireless media to come that ranged from its practical applications—such as checking in with a family member or coordinating fleets of cargo ships—to the more fantastical ones, such as exorcising ghosts or conducting séances.

The media historian Jeffrey Sconce has surveyed the visions of “electronic presence” brought on by the seemingly disembodied consciousness of wireless and, later, radio, television, and digital media. Growing out of each of these technological *epistemes* is a “media folklore” in which users and devices can be possessed by “ghosts in the machine.” Sconce argues that “such dreams have

always been vivid and seemingly eminent but are, of course, ultimately impossible. In the end we are always left with a *material machine* at the heart of such supernatural speculation, a device mechanically assembled, socially deployed, and culturally received within a specific historical moment.”<sup>2</sup> In this model, we have a hard technical core that gradually becomes diluted as we move outward from the material of the machine through various layers of social use and cultural representation. Each device begins to lose its material specificity as it flows into a disperse and apparently transhistorical folkloric tradition. In this article, I call into question this long-standing separation of the object and its reception, the tool and its socially deployed instrumentality. In contrast to the fantasies enumerated by Sconce about making contact with the other side, the technical characteristics of a device that might enable something like ubiquitous connectivity began to take on definite contours. Before an entirely legible message could even be recorded with wireless telegraphy, projected capabilities such as selective tuning, the transmission of voice and music signals, and portability served as nodes around which researchers and writers focused their energies. These nodes often worked in lockstep, and, almost from the beginning of Marconi’s demonstration of the technology, a system of discrete capabilities came together to form a speculative apparatus known as “pocket wireless.”

To speak of the definite contours of a “speculative apparatus” might seem counterintuitive. But part of our task here is to bring into focus the way a particular gadget circulates through culture not just as a tool but as a kind of narrative that feeds back on the perceived functionality of the tool itself. After all, “speculation” and “apparatus” both refer to a thing to be understood and a means of understanding, both of which are necessary to any discussion of media.<sup>3</sup> The narrative of pocket wireless—a portable telegraph transmitter and receiver whose ability to be carried on one’s person allowed it to be integrated into a range of communicative situations—became a means through which wireless telegraphy was explained to the public. The hope was that the device would “materially assist to popularize wireless,” moving it out of the domain of basement experimenters eavesdropping on naval transmissions or playing with their own cryptic codes, and into the realm of the everyday.<sup>4</sup> Prototypes were developed and even sold to the public by everyone from the most connected members of the burgeoning consumer electronics industry, such as Marconi himself, all the way down to amateur basement experimenters like fifteen-year-old Lewis Mumford, whose first published piece of writing was a blueprint for a portable wireless receiver in *Modern Electrics*.<sup>5</sup>

Pocket wireless succeeded in “materially popularizing” the new

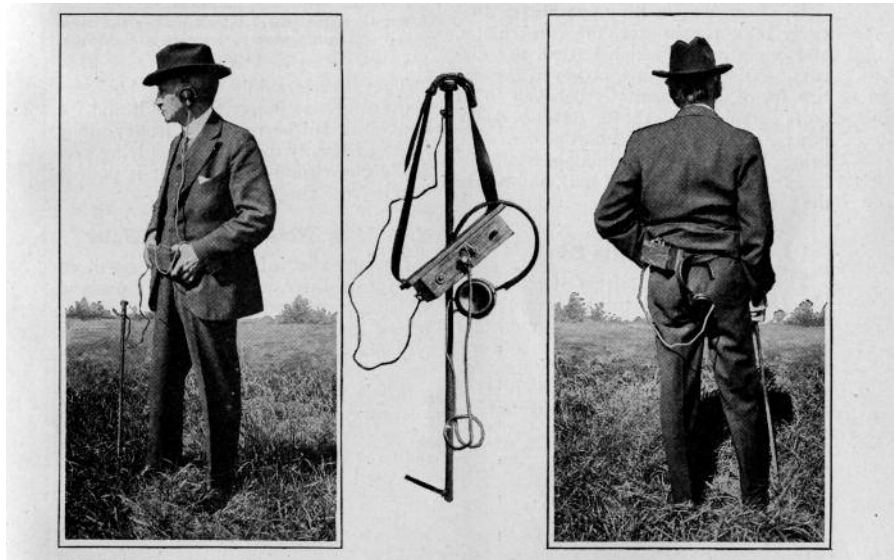
technology of wireless, not only as a *functional device* that crystallized those dimensions that distinguish wireless telegraphy from wired telegraphy—that is, dramatizing how a transformation of the material substrate of a communications medium alters the nature of the medium itself—but as a *fictional device* in novels and cinema. As if assuming a fluid exchange between devices and plot devices, fictional articulations of pocket wireless were often cited in popular and trade publications alike as evidence of the device’s imminence, a phenomenon that has as much to do with the emergence of science fiction as it does media history. Similarly, depictions of the device in newspapers and popular science magazines focused not only on the technical contours of the device (a coherer, aerial, ground, and headset) or its abilities (reception at thirty miles from the pocket of a coat), but also on narrating the situations in which such a tool might become useful. At a moment in which wireless telegraphy’s transmission of messages through the air was not fully understood by the scientific community, practical demonstrations of the new technology were fit into narrative frameworks such as dialogues, metaphors, hypothetical situations, and receptive postures made possible by the contours of the city.

A minor figure in media history, pocket wireless was never adopted to any great degree and was quickly passed over in favor of more-practical devices and modes of communication. But it constituted a pattern of expectation that held sway over the reception of wireless telegraphy for about twenty years, taking on a range of material manifestations.<sup>6</sup> What follows is a brief genealogy of this gadget as it circulated in the form of “baseless” speculation, blueprints, prototypes showcased for the press, props and plot devices in fiction and film, vaporware advertised alongside X-ray specs and vitamin tonics in the back of popular science and children’s magazines, and, more recently, an anecdote trotted out as a century-old “prediction” of the mobile phone.

### **“Call Up Wifey on the ‘Stove-Pipe’ Radio”**

As early as the 1890s, the form factor of the pocket served as a kind of vanishing point for the ultimate development of the wireless transmitter and receiver. Just months before Marconi’s demo at the America’s Cup, Arthur V. Abbott described how the potential of wireless telegraphy heralded not only the obsolescence of the telegraph’s physical infrastructure but the virtualization of that infrastructure onto the bodies of wireless users:

Telegraphing without wires—how attractive it sounds. No more unsightly pole lines disfiguring the streets and highways, ornamented with the dangling skeletons of by-gone kites. No more perpetual excavation of the streets, to find



room beneath their surfaces for additional circuits that cannot possibly be crowded on to the staggering lines that darken the sky with their sooty cobwebs. A little instrument that one can almost carry in the pocket, certainly in a microscopic grip, and if your correspondent be likewise equipped, you may arrest his attention and talk to him almost any time or place, with no intervening medium but the omnipresent luminiferous ether, a veritable 19th century realization of the dreams of the Rosicrucians.<sup>7</sup>

Above: "With his pocket wireless apparatus attached to his body, Dr. Cox, the inventor, becomes a veritable radio station." From *Popular Science Monthly*, December 1915.

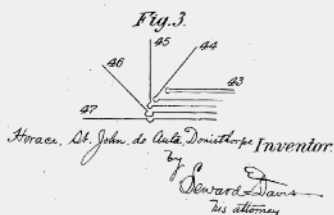
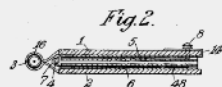
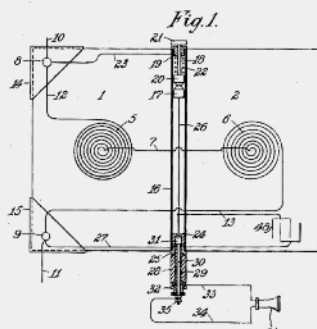
Opposite: Noted ant taxonomist Horace St. John Donisthorpe's "pocketbook receiver," tuned by opening and closing the "covers" at various angles. Horace St. John de Aulâ Donisthorpe. Patent application for Radio Telegraphic and Telephonic Apparatus, U.S. patent 1,388,936, filed April 28, 1920, and issued August 30, 1921.

True to the terms set up by Abbott, many science and technology journalists over the next three decades were fascinated by the possibility that the vast and messy infrastructure of the telegraph might be neatly wrapped around the body of an individual, mobile user. In 1907, the *New York Times* reported on a twenty-year-old tinkerer who had devised a "miniature apparatus . . . which may mean a vast deal in the everyday life of mundane existence." Narrating his astonishment at the series of marvels put forward by the "boy," the reporter asks where the antenna is.

He pulled out a tiny stretch of wires, built in the same form as is the aerial over a big station. He then tucked it with a pin inside of his coat near the collar and let it hang. The rest of his little wireless outfit was strapped about his waist with a buckle.<sup>8</sup>

Playing into the archetype of the "boy genius" inventor popular around the turn of the century, these articles told of young electric enthusiasts threading wires throughout their garments and planting miniature receivers on various parts of their bodies.<sup>9</sup> By the 1920s, the sight of such an outfitted youth walking down the street was commonplace, according to a *New York Tribune* article on noted radio home-brewer Leon W. Bishop.

Five or six years ago, [Bishop] won a reputation as being more or less of a nut because he might often be seen walking about



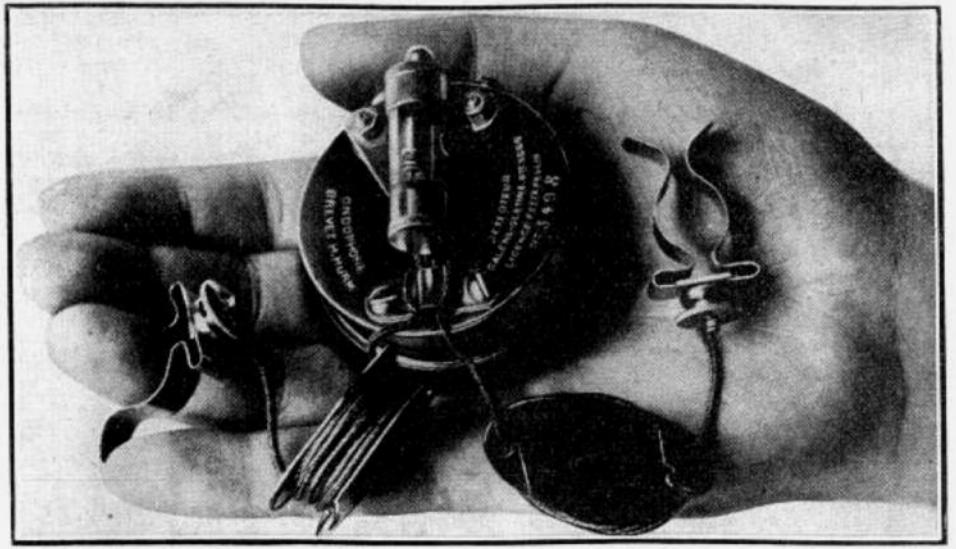
the streets with wires dangling from his hat and running down to a cane, while another wire trailed from one foot. Occasionally Bishop would hold out his cane, put one hand in his pocket, fumble with something—and announce that he was receiving a wireless message. Today almost anyone would know what he was doing, but five or six years ago the man who knew anything about wireless was an exception and unless Bishop took the time to let spectators “listen in” to the dots and dashes, no one believed him.<sup>10</sup>

Over the course of five years, a gesture as simple as fumbling through one’s pocket had come to be associated with a completely different kind of cultural technique. Rather than sifting among a private collection of objects or scraps, the users of the pocket wireless receiver now opened themselves up to a “receptive situation” in which live bits of information or messages

from home might be skimmed from the airwaves. Collections of utilitarian or discarded objects were joined by information such as weather signals or stock quotes, and one’s perception of dipping into the pocket now had to accommodate an understanding of both of these kinds of materiality. A hand reaching for a pocket watch could now just as easily be tuning a “pocketbook receiver” to pick up a time signal broadcast at regular intervals from miles away.

The idea of telegraphic signals transmitted through the air transformed the pocket into a potential carrier of virtualized infrastructures. By the 1910s, Abbott’s projection of a wireless world was seemingly confirmed, as proposals and blueprints for pocket wireless filled the pages of trade journals such as *The Electrician*, *Electrical Review*, *Wireless World*, and *Telephony*. Daily newspapers and the burgeoning field of popular science magazines—which included titles such as *Modern Electrics* and *Popular Mechanics*—soon followed suit. Pocket wireless devices were frequently submitted to inventors’ contests in journals such as Marconi’s *The Wireless Age*, which included a monthly prize segment titled “From and For Those Who Help Them Selves: Experimenters’ Experiences.”<sup>11</sup> By the end of the decade, other industry publications were picking up on the concept and proposing its application in their own fields. *Coal Age* reported that pocket





Horace Hurm. Ondophone, ca. 1914. From "The Ondophone," *Popular Electricity and the World's Advance*, May 1914.

wireless might be an effective tool in the improvement of mine control and safety, and the *Journal of the United States Artillery* wrote of a fountain pen receiver designed by the eminent inventor Lee De Forest that could be employed during field operations.<sup>12</sup>

But the irony of Abbott's original 1899 evocation of the older, physical infrastructure of the city being replaced by a new electric sphere beginning to envelop it would be made clear by these new designs. Most of the depictions of pocket wireless that appeared over the next two decades involved a user making physical contact with some kind of urban infrastructure—a drain pipe, an iron bannister, a railway track, or even a puddle—in order to pick up a signal. Surveying the coverage of pocket wireless and its development over this period, the variety of objects to which the device might be connected indicates just how many different communicative situations journalists and promoters hoped the device could be integrated into. Objects serving as "aerials" (an early term for antennas) included rifles, umbrellas, stovepipes, curtain rods, manhole covers, bicycles, and (counterintuitively) telegraph poles. The apparatus could be grounded using metal-heeled shoes, a stick or cane one would have to carry around, or any metallic surface that one happened to pass over. The Ondophone, for instance, a compact crystal detector manufactured and sold in Paris by Horace Hurm around 1914, and one of the earliest complete wireless receivers sold to the French public, achieved different levels of performance depending on the nature of the objects the user had readily available. The Ondophone was designed to receive time signals and weather reports broadcast in Morse code from the Eiffel Tower out to a radius of thirty miles, but this distance could be increased depending on the nature of the metal object to which the user connected the device's tethered clips. A bicycle or an automobile could boost reception up to 120 miles, and "a stove, wire fence or grating, bedstead and the like" could extend that distance to 300 miles.<sup>13</sup>

While reports on the latest pocket wireless prototype leave us with a beautiful steampunk image of people strolling about, connecting their vaguely stethoscopic “leads” to the humming infrastructure of the city in order to receive the latest weather report or stock quotes, the proposed social situations in which the device might operate were surprisingly mundane. At least two Philadelphia inventors, Frank Chambers and W.W. Macfarlane, demonstrated their versions of pocket wireless to journalists from 1914 to 1920. Though both refused to reveal the particulars of their designs, they staged elaborate performances of the device in ways that revealed it to be a highly gendered means of point-to-point communication. Descriptions of the projected functionality of pocket wireless in these articles often consist of the mobile husband roaming about the city, communicating with his sedentary wife, who remains at home to operate the transmitter. *World Today* covered Chambers’s design in their “Making of To-Morrow” section (“How the world of to-day is preparing for the world of to-morrow!”). An accompanying photograph depicts Chambers standing on a train track for better reception and angling his high-hat receiving apparatus to pick up a message from his wife, who operates the sending device at home:

He has a sending apparatus at his home, and he has taught his wife to use this and has perfected her in the Morse code at which he is an adept himself. Consequently, he enjoys the novel pleasure of being able at any time to carry on a one sided conversation with his wife. It is necessarily one sided for he can not talk back—he can only listen—a handicap that has its disadvantages as well as possibly its advantages.<sup>14</sup>

With the sending wife and the receiving husband correctly “syntonized” (tuned) to one another, they might remain in constant contact throughout the course of the day “by agreeing to be in a receptive situation at a certain time.” An apparent commonplace among Philadelphia tinkerers was to plant their spouse in a fixed location while they roved around, showing off for reporters. Macfarlane staged his demonstration from the back of an automobile: “Three men in a moving auto listened while the fourth held converse with his wife in a garage 500 yards back, the car body serving as the wave collector.”<sup>15</sup> Distinct from the more speculative genres of writing on wireless communication’s potential popular at the time, such as interplanetary contact or the surveillant fantasies of television and visual telephones, pocket wireless neatly mapped onto existing sociocultural norms, simply articulating them across greater distances. Often, these dreams of ubiquitous connectivity proved surprisingly pedestrian, notwithstanding attempts by the journalists covering such demonstrations to contain their incredulity: “It is no wild dream



to say that a man riding on a train to New York can telephone his wife about bringing a friend home for dinner by using this device.”<sup>16</sup> Or, even better: “It is at least something more than a toy, and has interesting possibilities as an accessory to the summer outing outfit.”<sup>17</sup>

If extending the domestic space across the city was one of the most compelling images of the pocket wireless in operation, networking an army of soldiers on the battlefield was the other. Macfarlane in particular was fond of pitching the military applications of his design.

If this could have been ready for use in the war, think of the value it would have had. A whole regiment equipt [*sic*] with the telephone receivers, with only their rifles as aërials, could advance a mile and each would be instantly in touch with the commanding officer. No runners would be needed.<sup>18</sup>

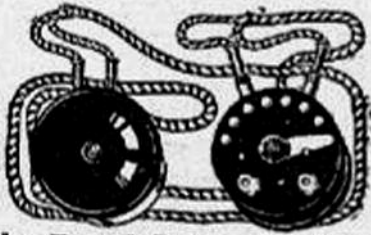
In a remarkable piece published in the March 1911 issue of the children’s magazine *St. Nicholas*, an entire army is incorporated using the metaphor of the general’s body to describe “the light, compact, and highly sensitive electrical nerves of armies today.” Just as “injured skin sends a telegram by way of the nerves to the brain, which in turn telegraphs back again by some more nerves to the muscles,” transmitting “commands that are obeyed without question,” the technology of modern warfare allows generals to fight as if directly with one another, “each of them armed with an army.”<sup>19</sup> From the dining room to the coal mines to the battlefield, pocket wireless would afford a greater degree of organization among the movements of networked individuals.

### Devices and Plot Devices

While newspaper and magazine coverage showed a wide range of applications for pocket wireless, they did so through a confusing mix of indicative and subjunctive modes, present and future tenses, leaving unclear whether the technology constituted a future development, something currently available, or an idea that had been anticipated for centuries but was only now within the realm of possibility—of being “realized.” These diverse presentations overlapped so neatly that in the same year pocket wireless was “prophesied” as a revolutionary tool of tomorrow it could be purchased from the mail-order section in the back of various experimenter magazines for as little as \$3. How might one reconcile these two radically different materialities? We might make some sense out of the fact that most of the pocket wireless devices offered for sale at the time were at best impractical and at worst vaporware. The Imperial Pocket Wireless



## POCKET WIRELESS PERFECTED AT LAST



Don't take your clumsy outfit to camp this year, buy an ESANKAY Pocket Outfit, it will do good work and it only weighs ten ozs.; tunes to 1200 meters. Very simple to operate, nothing to get out of order. Boy Scout agents wanted. Price \$3.00—10 cents extra

by Parcel Post. Send stamp for circulars S. 1&2.  
S. & K. Electric & Mfg. Co., "Exceptional Wireless Apparatus"  
Office and Showrooms: 302 Sackett, near Court St., Brooklyn, N. Y.

Opposite: "Receiving a Message from Home." W.W. Macfarlane demonstrating his high-hat receiving apparatus, standing on a streetcar rail for better reception. From H.D. Jones, "Pocket Wireless," *World Today* 20 (June 1911).

Above: "Pocket Wireless Perfected at Last" Advertisement for Esankay Pocket Outfit, S. & K. Electric and Manufacturing Company, *Boy's Life*, July 1915.

receiver, manufactured in Lima, Ohio, and advertised in the May 1908 issue of *Popular Mechanics*, was designed to use a half-inch spark gap.<sup>20</sup> Just how impractical some of these designs were becomes clear when one considers that this spark gap—an early means of transmitting electromagnetic waves that involved passing a live current of electricity through the air between two electrodes, in this case at a distance of half an inch—had to be worn on one's person or carried around in the hand. Subsequent ads for the Imperial receiver improbably claim that the portable spark gap receiver can be used "when boating, autoing, bicycling, etc." For some commentators, the questionable merits of these designs meant that pocket wireless was better considered as a fictional invention, a tool far more useful for mystery writers than advancing armies. As one wrote, "Pocket wireless only exists so far in the minds of the writers of thrilling spy stories, but the day is very near . . . when light, portable sets meant to dismiss the idea of pocket wireless as impossible or even improbable. Indeed, the popular and trade publications of the time took the fact of pocket wireless's appearance in works of fiction as further evidence that the device was even closer to realization.

Much like the wide applicability of its functional cousin to many different industries and social situations, the fictional version of pocket wireless was featured across a range of literary genres. Wireless telegraphy pervades the high-adventure mystery novels of South Dakotan Charles Edmund DeLand, whispering to characters of revolutions, the position and speed of aircraft, and broadcasting theatrical programs live around the globe. In his 1917 novel *The Psychic Trio, or, Nations Reconciled*, for example, pocket wireless serves as a backup for destroyed airplane wireless attachments.<sup>22</sup> In 1913, J.D. Archer published "The Telephone Engineer's Imaginary Mexican Escapade," a story whose subtitle needs no further explanation: "In Which Our Hero Invents a Pocket Wireless Telephone Instrument, Acts as a Spy in a Mexican Battle, Holds Conversations with His Friends while in the Enemy's Ranks and—Wakes Up!"<sup>23</sup> The device was featured in a number of cinematic narratives as well, particularly in detective serials around 1915, at moments when the film's hero has been

captured, held prisoner, and needs to radio out for help. Otis Turner's now lost serial *The Black Box* (1915, United States) introduced the criminologist Sanford Quest, who, along with his two female assistants—mediums of a different kind controlled through “hypnotism and the use of electro-telepathic appliances”—deployed an arsenal of fictional gadgetry in the service of solving a murder mystery.<sup>24</sup> In part three of the serial, titled “The Pocket Wireless,” Quest communicates with one of his assistants as she goes undercover in the home of the suspected murderer. The device is featured again in a July release of the same year with Victory Films' *The Isolated House*, an American version of Richard Oswald's German feature *Der Hund von Baskerville*. According to *Moving Picture World*, in this adaptation of the Arthur Conan Doyle novel, Sherlock Holmes “takes up the case and in the course of his investigations is locked in a secret closet in the castle by the criminal who has recognized him. Armed with a pocket wireless outfit, Holmes calls an assistant and is quickly released.”<sup>25</sup> As a plot device, pocket wireless often provided pace and resolution to otherwise insoluble problems in narratives of suspense.<sup>26</sup>

Considering how the telephone's connection of remote spaces along a unified timeline provided the dimensions by which audiences could accept the reality of the cross-cut in early narrative cinema, one can only surmise how the incorporation of pocket wireless into the cinematic *mise-en-scène* would have affected the editing of these now lost films. Several critics have commented on the inherent science fictionality of early cinema, including Brooks Landon, who writes that the experimental short films produced by Thomas Edison, Georges Méliès, and the Lumière brothers “all centered on the gimmick of showing and exploiting technology that could dramatically cut or speed up the time necessary for certain processes.”<sup>27</sup> Speculative apparatuses such as pocket wireless figured prominently in these early science fiction films but were by no means limited to them. These gadgets had a role across genres as diverse as mystery, horror, musicals, and romance, suggesting a more nuanced account of science fiction's place in the history of cinema and the development of film form.<sup>28</sup>

While we can no longer register how the insertion of this device affected the narrative apparatus of film, we can see how pocket wireless enabled certain kinds of narrative actions or communicative possibilities in works of fiction. Pocket wireless makes a brief appearance, among a number of other technological wonders, in the proto-science fiction story “A Glimpse into the Future.” Consisting of a dialogue between Mr. A.D. Rocks of Chicago and Mr. J.K. Brocks of New York, the story tells of the state of the world in 2500 A.D., when France is at war with

Germany and Americans receive instant updates on the progress of the war through wireless broadcast. Periodically throughout the dialogue, Rocks contacts his wife via pocket wireless for the latest updates while she remains at home operating the main receiving apparatus. When Brocks tells Rocks of how beautiful the Alps were during his recent trip, Rocks responds, “Excuse me a moment; I’ll call up my wife and ask her to make a note of it. (Takes out a pocket wireless telephone and speaks briefly to Mrs. R. in Chicago.) There, that’s settled. She’s sure to remember it, she’s so fond of scenery.”<sup>29</sup> Rocks is not calling his wife simply to tell her about the Alps or that they should make plans to travel there (made easy in 2500 by transportation via “submarine tube”) but rather contacts her as his stenographer, as if she were a fully integrated component in his note-taking workflow.

Several media theorists, including Siegfried Zielinski, Bruce Sterling, Eric Kluitenberg, and Timothy Druckrey, have written on what they call “imaginary media,” devices that have no material existence outside of their fictional articulations. For these critics, such fantastical objects encourage us to deemphasize the apparatus in the history and theory of media technologies and instead focus on discursive cultural imaginaries. In Kluitenberg’s treatment, “the imaginary properties of media are often somehow obscured by the fact that so much of what is studied in the histories and theories of the media is embodied in physical media machines.” He goes on to say that an archaeology of such imaginary media “suggests a shift away from the utilitarian and toward the phantasmatic in ‘excavating’ these imaginaries from the histories of technology and the media and from the (media) practices of everyday life.”<sup>30</sup> But gadgetry such as pocket wireless—depicted throughout the 1910s in various shades of immanence, plausibility, and possibility—seems to evoke a completely different set of questions about the liminality of the real and the imaginary, the material and the immaterial. What is at stake here is the feedback between technical interaction and speculation, between science and fiction. While separating the utilitarian from the fantastic may be useful in dealing with projections such as universal translators, virtual reality, or communion with the dead, “imaginary media” just on the horizon require a slightly different approach. As we have seen with pocket wireless, the category of utility is slippery, comprising its inabilities, its real and anticipated applications, and depictions of its usability, each of which plays a constitutive role in the cultural imaginary of this speculative apparatus. To speak then of a “material machine at the heart of such supernatural speculation” (to return to Sconce) is perhaps to offer up a spatially inaccurate metaphor, one that artificially separates categories that are, epistemologically speaking, indistinguishable.

## The Mechanics of Speculation

The difficulty of assessing the veracity of these claims to portable wireless communication is precisely what makes the case of the pocket wireless so compelling for media archaeology. Despite the ongoing research and development reported in these publications and the enthusiasm for the new technology across a range of professions, technologists argued over the feasibility of pocket wireless as demonstrated to the press, demonstrations that engineers and physicists struggled to explain. Much of the early development of wireless telegraphy confined itself to tinkering with material components rather than coming up with a theoretical account of how or why such devices worked. This was often framed as focusing on “engineering” or “practical” questions, as opposed to “philosophical” or “theoretical” questions.<sup>31</sup> As *Electrical World and Engineer* stated,

A want—if not long felt, none the less real—exists for a theory of wireless telegraphy, or, at least, a working hypothesis, which will satisfactorily explain the functions of some of the details that have been found indispensable by Marconi and others in the apparatus employed in practical wireless telegraphy.<sup>32</sup>

The experimentation done with the “practical apparatus” outpaced any attempt to explain the operation of the apparatus itself. Thus the theory of the luminiferous ether as the medium through which radio frequencies moved was allowed to persist into the 1920s.

And so debates about the potential abilities of this highly schematic and poorly understood device did not confine themselves to literary circles. The future of telegraphy and portable communications was a popular topic at meetings of researchers and technical societies around the turn of the twentieth century, often surrounding the topic of capabilities unavailable to wireless telegraphy at the moment, such as selective tuning and the transmission of the voice. Like pocket wireless, the overarching idea of wireless telephony had its own prototypical narrative expositions. The scene usually involved a man who was able to contact a friend at any time and from any location across the globe. One of the most often cited source texts for this popular scene is an 1892 article by William Crookes, which some have argued inaugurated the very concept of wireless communications.<sup>33</sup> Crookes writes,

Any two friends living within the radius of sensibility of their receiving instruments, having first decided on their special wavelength and attuned their respective instruments to mutual receptivity, could thus communicate as often as they pleased by timing the impulses to produce long and short intervals in the ordinary Morse code.



For Crookes, the ability to converse with a friend at any time and from anywhere was

no mere dream of a visionary philosopher. All the requisites needed to bring it within the grasp of daily life are well within the possibilities of discovery, and are so reasonable and so clearly in the path of researches which are now being actively prosecuted in every capital of Europe that we may any day expect to hear that they have emerged from the realms of speculation into those of sober fact.<sup>34</sup>

Though the ability of two people to converse from a distance is the most cited prediction of Crookes's paper, the article goes on to discuss the uses of electricity "to improve harvests, to kill parasites, to purify sewage, to eliminate disease, and to control weather."<sup>35</sup>

Reviews of Crookes's paper and his subsequent lectures on the subject dismissed his speculations as "fairy-tales of science" that made it "difficult to know whether we should understand him literally, and take all his statements as the latest scientific truths." In one review essay from the *Spectator* titled "Science and Conjecture," the author sees as problematic that

the scientific authorities of to-day have fallen into a rather provoking and tantalising habit of taking the public into their confidence, making known to it discoveries that are as yet only half-known to themselves, and building upon the basis of those discoveries a bewildering fabric of conjectural possibilities as to the extraordinary phenomena that may result should the discoveries prove to be true ones. . . . The truths that they present to us are quite astounding enough; we are not really strong enough to grapple with their conjectures.<sup>36</sup>

Unaccustomed to the twentieth-century notion that popular science, speculative fiction, and "what if" scenarios could be an effective tool in scientific education, the reviewer equates conjecture with the methods of mesmerists, fakirs, and spiritualists, noting, "we find it sometimes as difficult to believe in the truth as we do to reject the fraud." Over the next decade, the conversation on the future of wireless did not always center on whether talking to friends anywhere at any time was a probable vision of the future or even if the depiction of this scenario was to be taken as a literal or symbolic account of contemporary research into electromagnetic waves. Rather, the most pertinent question seemed to be whether such a projection was even possible. As the scene of two friends picking up a conversation from anywhere across the globe circulated through technical journals in the late 1890s and into the 1900s, the emphasis shifted from technical



questions to the mechanics of speculation itself.

At a May 1901 dinner held by the Society of the Arts in London, Marconi delivered a paper on recent research into syntony, a then theoretical principle by which individual wireless telegraphs would be able to selectively tune or “syntonize” with one another (as opposed to every device transmitting on the same wavelength). The talk prompted the chairman of the society, William Edward Ayrton, a professor of physics and electrical engineering known for his mid-1890s experiments with electric arcs, to respond in a tone rather different from the hard, technical detail of Marconi’s presentation.<sup>37</sup> Ayrton’s comments, in their seeming anticipation of a technologic of today, have lately made the rounds in contemporary writing on mobile phones and Wi-Fi.<sup>38</sup> While the dominant theme in Crookes’s projection was the possibility of conversation across a distance greater than telephone wire could afford, something like the model of a “ping” strikes Ayrton as particularly salient. Ayrton is interested in testing the state of reachability rather than the content of that connection itself, holding out hope that a network of wireless users ceaselessly babbling “Can you hear me now?” might become so rich that “yes” could be taken to mean “alive,” and silence mean “dead.” The editor of London’s *Journal of the Society of the Arts* reports on Ayrton’s response to Marconi:

Although still far away, he thought they were gradually coming within thinkable distance of the realization of a prophecy he had ventured to make four years before, of a time when if a person wanted to call to a friend he knew not where, he would call in a loud, electromagnetic voice, heard by him who had the electromagnetic ear, silent to him who had it not. “Where are you?” he would say. A small reply would come, “I am at the bottom of a coal mine, or crossing the Andes, or in the middle of the Pacific.” Or, perhaps, in spite of all the calling, no reply would come, and the person would then know that his friend was dead. Let them think of what that meant, of the calling which went on every day from room to room of a house, and then think of that calling extending from pole to pole; not a noisy babble, but a call audible to him who wanted to hear and absolutely silent to him who did not, it was almost like dreamland and ghostland, not the ghostland of the heated imagination cultivated by the Psychical Society, but a real communication from a distance based on true physical laws.<sup>39</sup>

The precise distance between “the ghostland of the heated imagination” and “real communication . . . based on true physical laws” was fiercely debated. Technologists argued over the nature of speculation into abilities not yet within the realm of possibil-

ity, what the use of such “prophecies” were, and whether they could use as evidence an increasingly popular sense that with each of the latest technological marvels, the prophecies of past eras were being realized.

The following summer, *The Electrician* published a review of yet another area of research and development, wireless telephony, or the ability to send voice and music signals over the airwaves—as opposed to simple telegraphic signals such as Morse code. The author cites Ayrton’s vision of the attempt to ping a deceased friend within a ubiquitous cloud of communicative possibility, acknowledging that

imaginative persons have pictured a state of civilisation in which promiscuous conversation could always be carried on by means of pocket wireless telephones. . . . Yet we are compelled to admit that these things belong to fairyland and the world of dreams; not to the matter-of-fact everyday world in which we live.<sup>40</sup>

At stake here is not the eventual possibility of wireless telephony but our ability to extrapolate such a device out of “existing lines of research,” calling into question the “thinkable distance” cited by Ayrton the previous year.

It is, of course, quite true, and as trite as it is true, that we cannot claim to be able to perceive the limits of possible future scientific inventions. But that is not the point. A generation ago no one could foresee the telephone; less than three generations ago the electric telegraph was no more than the idle dream which wireless telephony is to-day. A future generation, therefore, may conceivably accomplish as much in wireless telephony as is dreamed of to-day by visionaries. But if it does, it will be by means of discoveries hitherto not even suspected, and by methods not even the germ of which can be detected in the wireless telegraphy of to-day.<sup>41</sup>

The author grants the possibility that something resembling the idea of pocket wireless might come about some decades from now. However, he asserts that to anticipate future developments in wireless technology is fundamentally impossible and that successive configurations and revolutionary new advances in the field of electromagnetic wave propagation will outstrip everything known at present about wireless communication.

The “Wireless Telephony” passage ends by noting that dreams of wireless telegraphy will be realized by means of “methods not even the germ of which can be detected in the wireless telegraphy of today.” Framed as it is in the vein of a time-traveling, science-fictional counterfactual, this line raises several important temporal issues. First, how are these anticipations, formulated in

“Wireless Telephony” as “dreams” and earlier by Ayrton as “prophecies,” produced in the first place? The author of the *Electrician* editorial allows for the possibility that we may accomplish in the future the dreams of wireless today. But his proposition is that these dreams will be realized through a method totally alien to anything we know, leaving us to wonder about the medium through which such anticipations take shape. This brings up a second question regarding the keyword *method*. No longer are we talking about individual devices or even the more disperse “technology,” with its implications of an established social infrastructure. Instead, we are left to consider “method,” a style of performing a task. How does one detect the germ of a method native to the future in the experimental proposals at hand, a method whose cultural protocols and technical infrastructure are not yet in place? Might such a method have a material existence beyond “fairylane and the world of dreams”?

### **Toward Science Fiction**

One of the most interesting specimens in the history of pocket wireless is not the most technically original, nor does it project the most imaginative communicative scenario. However, both its designer and the circumstances of its appearance in the April 1911 issue of Hugo Gernsback’s *Modern Electrics* merit attention. In the magazine’s monthly “Experimental Department,” where readers could submit their home-brewed designs for novel electric devices, a fifteen-year-old Mumford, who would later author the magisterial history *Technics and Civilization* (1934), published his first piece of writing, a blueprint for a new kind of compact wireless receiver he described as “a portable wireless outfit smaller than a small camera, in which sensitiveness is not sacrificed to saving of space.”<sup>42</sup> Flipping back three pages in the same issue, one finds the first installment of Gernsback’s serial novel *Ralph 124C 41+ : A Romance of the Year 2660*, one of the earliest works of modern science fiction.

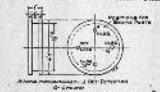
The proximity of this future media theorist’s first piece of published writing to one of the foundational works of science fiction is no coincidence. Mumford’s early preoccupation as a tinkerer took root in a forum for the exchange of designs, components, and visions of the future. *Modern Electrics*, which began as a mail-order catalogue for wireless parts and other electrical equipment, evolved into “A magazine devoted entirely to the Electrical Arts.” In a tradition that extended into Gernsback’s later publications—including *Electrical Experimenter*, *Radio News*, *Science and Invention*, and *Amazing Stories*—*Modern Electrics* pioneered a kind of writing that combined hard technical description with an openness to the fantastic. It was a mixture out of which an entire literary genre emerged to tackle the question of the dis-

ready for adding with an ordinary soldering copper and the rosin acid.

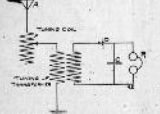
WALTER MILLER

TUNING TRANSFORMER

As everybody knows who has tried it, the making of a transformer for tuning is a different job from that of a transformer for the purpose of music.



Use a groove on the circumference about half an inch wide, and a quarter inch deep, at per illustration. Then wind about a hundred turns of No. 14 insulated copper wire on this disk, leaving the ends for attaching to binding posts.



and with which less trouble than the ordinary tuning transformer, and cutting a great deal less, as shown every day in the market.

WALLACE BILE

TO CLEAN CONDENSER PLATES

While making a condenser from photographic plates some time ago I discovered what I think is a quick, easy way to clean off the gelatine.

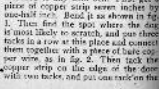


The edge against the plate very finely. This will take off all or nearly all the gelatine at one sweep.

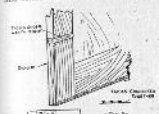
ARTHUR F. MASON

A DOOR BELL FOR THE DOG

The following is a description of a door bell for a dog. The dog scratches on the door and thereby closes the circuit which rings a bell.



where the dog is to scratch. Connect the upper strip and the ends of the strips which are underneath it, to the door, and run it off of the hinges, and connect to the door bell.



It is necessary that the end of the upper strip does not touch the door, as it should be about one-sixteenth of an inch from them.

ARTHUR T. LEGGETT

A GOOD WATER RHEOSTAT

Obtain a gravity battery for holding about a gallon of water. For the rheostat use pieces of No. 6 copper wire as best.



as a switch. A little salt should be sprinkled in the water until the right amount of current flows.

ARTHUR T. LEGGETT

for running small motors, trains, and with an electrolytic resistor, can be used to run a spark coil for wireless telegraphy.

LYUR SCOTT

IS THIS A RECORD?

A transformer five miles right along in the mountains (over land) with the following set, using eight batteries, too weak to create a spark coil.

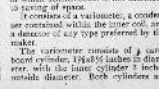


It is made of No. 3 ribbon-wound copper wire. My total is composed of three aluminum wires two feet apart (No. 14) screwing into each high end and connected on one long.

I. F. CAMGROS

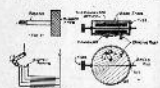
A PORTABLE RECEIVING OUTFIT

Below is described a portable wireless outfit smaller than a normal outfit, in which convenience is not sacrificed to saving of space.

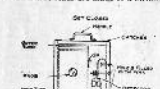


ARTHUR T. LEGGETT

wound with an equal amount of No. 22 B. & S. gauge enameled wire. In placing the inner coil in position, brass piece as shown in Fig. 1 may be



found convenient to screw into the brass rod if the outer coil is not sufficiently flexible to allow the rod to pass through both holes.



as shown in Fig. 2, after which the whole condenser is embedded in paraffin. Two condensers would be satisfactory.



The mineral detector, either peridot or silicon, is used. The type shown in the drawing is very satisfactory.

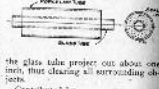
ARTHUR T. LEGGETT

than 6/16ths of an inch. Blank train and a coil of varnish will give a fine appearance.

LEWIS C. MUMFORD

A VERY GOOD LEAD-IN

In the month's issue of 'Modern Electrician' was a description of a lead-in for use in small stations.



The glass tube proper cut about one inch, then cleaning it thoroughly with alcohol.

SCHWARZENBECK

CLIP FOR HELIXES OF THE REBORN TYPE

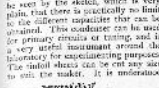
Take a piece of brass rod about three-eighths inch in diameter and two inches long. One corner work from one end and saw a slit with a hacksaw about half way through.

GEORGE DIETZ

AN ADJUSTABLE CONDENSER

The condenser consists of seven square inches of tin foil and was paper, made up in seven sections as per sketch; 14 pieces of brass, 1 inch by 1/2 inch by 1/8 inch, and 1 piece of inch by 2 inch by 1/8 inch (binding posts) and 18 plugs to hold as per

sketch. The condenser is made up in the regular way, from a sheet of wax paper, then a sheet of tin foil with which conductors have been used.

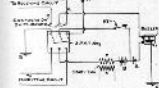


For this switch I secured a three-pole single-throw one add three clamps of generator. The contacts were secured only the hole in the base of the switch box, and the contacts were secured directly to the base, as shown in the sketch, thereby doing away with purchasing two switches as described in the March issue of this paper.

HERBERT MOSHER

PORTABLE WIRELESS OUTFIT

The following set is very light and compact and of 437 type preferred by the market.

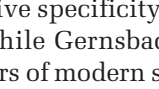


1. Aerial in an ordinary umbrella. Telephone receiver. 2. Detector (attached to belt by two T-shaped hooks)

H. MCABE

ORIGINAL AERIAL SWITCH

While experimenting with my wireless set the other night, I got a bad shock from my aerial switch, and I decided to take steps to see that it would not happen again.



I secured my others which resulted and attached it to the handle of my aerial switch. This wires O. K., the only trouble being that every time I touched the key the handle fell away from me.

'RIPPS'

Lewis Mumford's first piece of published writing. Lewis Mumford, "A Portable Receiving Outfit" Modern Electrics, April 1911.

tinctive specificity of "medium" in a new wireless age.<sup>43</sup> While Gernsback is widely credited as one of the founding fathers of modern science fiction, and the Hugo Award named for him is given out each year to the best works in the genre, he now receives little more than a one- or two-sentence nod in science fiction studies. The canonically accepted story is that Gernsback launched the genre as the founding editor of Amazing Stories in April 1926, treated the magazine as little more than a commercial venture, and with his "crude and heavy-handed" editorial style ended up perpetuating many of the negative stereotypes still associated with science fiction.<sup>44</sup> Much of this attitude has been inherited from a generation of science fiction scholars who were not academics but editors who disparaged Gernsback's editorial practices as well as the infamously low wages he paid his writers.

But this inherited version focuses only on the period from *Amazing Stories* and after, almost entirely overlooking the context of the genre's birth in Gernsback's fleet of electrical experimenter magazines, as well as his work as a pioneer in media technologies and broadcasting techniques. In magazines like *Modern Electrics* (1908–1914), which began as a mail order catalogue for Gernsback's electrical-parts importing company, one could find a literary treatise on what the genre of "scientifiction" should look like alongside a blueprint for a homemade television receiver. Translations of an influential German handbook titled *The Practical Electrician* ran alongside speculative articles on what would be required to send (and receive) a wireless signal from Mars. Long before *Amazing Stories*, writers in these technical publications used speculative fiction in their attempts to find a language suited to the analysis of emerging media such as radio, television, or the more exotic osophon and telegraphone. This was a moment when the shape of media to come was totally up in the air, and for the technologists and storytellers negotiating the contours of pocket wireless, the material of the machine was precisely the means through which its futures were negotiated. Contrary to the aims of the author of "Science and Conjecture," who draws a line between the era of science and technology and that of spiritualists and mediums, a properly techno-logical tradition did carry into the twentieth century in which "medium" remained a vehicle of projection and foresight.



## Notes

1. Susan Douglas, *Inventing American Broadcasting, 1899–1922* (Baltimore: Johns Hopkins University Press, 1987), 32; and Henry Schlesinger, *The Battery: How Portable Power Sparked a Technological Revolution* (New York: HarperCollins, 2010), Kindle ed., loc. 2901.

2. Jeffrey Sconce, *Haunted Media: Electronic Presence from Telegraphy to Television* (Durham, NC: Duke University Press, 2000), 20; emphasis added.

3. Both *speculation* and *apparatus* are terms with long and complicated histories in the philosophical concept of medium and mediation. For the apparatus theory film school in the 1970s, apparatus (*dispositif*) is a system of relations developed among completely heterogeneous institutions or mechanical components, be it a Techniscope lens or the ideology of a ratings board. Despite its failure to become widely accepted, apparatus theory—a synthesis of Marxist and psychoanalytic theories, with some strains of phenomenology tied in (especially in Jean-Louis Baudry’s work)—provides useful conceptual tools for thinking about the form of cinematic narrative as a product codetermined by its material substructure (camera, lens, projector, theater, etc.). This is something rare in media theory—an attempt to take into account simultaneously form *and* content, both cinema’s narrative specificity and its technical means of support. The heritage of this group is that the term is now taken to encompass both the material provided by the medium and the sociopolitical contexts in which meaning is fashioned. Similarly, the word *speculation* contains within itself both the “contemplation, consideration, or profound study of some object” and the comprehension of vision itself (i.e., both the message and the medium). *Speculation* refers both to “the conjectural anticipation of something” as well as to the final product of this anticipation, “a conclusion, opinion, view, or series of these, reached by abstract or hypothetical reasoning.” That is, the word encompasses both the experiment and its hypothesis. See s.v. “Speculation,” *The Oxford English Dictionary*, 2nd ed. (Oxford, UK: Oxford University Press, 1939), online ed., <http://www.oed.com/>.

4. A.R. Burrows, “Wireless Possibilities,” in *The Year-Book of Wireless Telegraphy and Telephony: 1918* (London: The Wireless Press, 1918), 960. For a similar take on the popularization of wireless through audio transmission, see Erich F. Huth, “Apparatus for the Demonstration of Wireless Telephony,” *Modern Electrics* 3, no. 10 (January 1911): 555: “The interest concentrated upon wireless telegraphy owing to its application to the transmission of news has been materially increased by the possibility of wireless telephony.”

5. Lewis Mumford, “A Portable Receiving Outfit,” *Modern Electrics* 4, no. 1 (April 1911): 22–23.

6. The phrase “pattern of expectation” comes from I.F. Clarke’s history of science fiction, a genre whose defining feature he takes to be depictions of the future. I.F. Clarke, *Patterns of Expectation, 1644–2001* (London: Jonathan Cape, 1979).

7. Arthur V. Abbott, “Electrical Radiation,” *Electrical World and Electrical Engineer* 33, no. 23 (10 June 1899): 802. This lyrical exposition appears unexpectedly at the end of a five-part weekly series working out a possible (albeit inaccurate) theoretical explanation for wireless signal transmission, peppered with diagrams, equations, and quantitative models that attempt to explain Marconi’s results. The series was published in response to “Theory of Wireless Telegraphy,” an article in *Electrical World* that called for a scientific explanation for the practical effects achieved thus far. Abbott’s series was the culmination of a lengthy correspondence among readers in the letters-to-the-editor section.



8. "New Wonders with 'Wireless'—and By a Boy," *New York Times*, 3 November 1907, pt. 5, 1.

9. The Tom Swift novels were the most famous of the boy genius inventor subgenre, ghostwritten by various authors under the pseudonym Victor Appleton beginning in 1910. Titles include *Tom Swift and His Wizard Camera* (1912) and *Tom Swift and His Photo-Telephone* (1914). See John T. Dizer, *Tom Swift & Company: "Boys' Books" by Stratemeyer and Others* (Jefferson, NC: McFarland, 1982); Everett Franklin Bleiler, "From the Newark Steam Man to Tom Swift," *Extrapolation* 30, no. 2 (1989): 101–116; Everett Franklin Bleiler and Richard Bleiler, *Science-Fiction, the Early Years* (Kent, OH: Kent State University Press, 1990); and Brooks Landon, *Science Fiction after 1900: From the Steam Man to the Stars* (New York: Routledge, 2002).

10. Jack Binns, "Amateurs Race to Make Vest-Pocket Set," *New-York Tribune*, 19 February 1922, 6. The presence of information in the pocket was important to Bishop, who wrote *The Wireless Operator's Pocketbook of Information and Diagrams* (Lynn, MA: Bubier Publishing Company, 1911). Perhaps the development of the pocket wireless a few years later was, for Bishop, simply the next logical step in compact, portable information.

11. "An Efficient Pocket Wireless Set," *The Wireless Age*, July 1914, 849.

12. "Imagination Applied to Mining," *Coal Age* 10, no. 4, (22 July 1916): 142–144; and "The 'Fountain Pen' Receiver—A Portable Wireless Receiving Set," *Journal of the United States Artillery* 46, no. 3 (November–December 1916): 396–397.

13. "Vest-Pocket Wireless Receiving Instrument," *Electrical Review and Western Electrician*, 11 April 1914, 745. For more on the Ondophone, see the unnamed Paris correspondent's report on "A Pocket Wireless Set," *Modern Electrics and Mechanics* 28, no. 4 (April 1914): 436. See also "Pocket Wireless Receiver," *Our Young People*, July 1916, 28.

14. H.D. Jones, "Pocket Wireless," *World Today* 20 (June 1911): 747.

15. "Radiotelephone Station in a Handbag," *Popular Mechanics* 31, no. 6 (June 1919): 807. We do not begin to see images of women and mobile connectivity until the mid-1930s. See, especially, the illustrations in Edwin Teale, "Television and Pocket Radios Promised by Latest Short-Wave Tests," *Popular Science Monthly* 129, no. 3 (September 1936): 9.

16. "Call Up Wifey on the 'Stove-Pipe' Radio," *Electrical Experimenter*, June 1919, 115.

17. Jones, 747.

18. "Call Up Wifey on the 'Stove-Pipe' Radio," 115.

19. C.H. Claudy, "The Nerves of an Army," *St. Nicholas* 38, no. 1 (March 1911): 413, 418. This militaristic metaphor for wireless signaling might be seen as an anticipation of the kind of role technology took on in fascism, the people merely an extension of their leader's body. For more on "wireless writing" and the fascist symbolic, see Timothy C. Campbell, *Wireless Writing in the Age of Marconi* (Minneapolis: University of Minnesota Press, 2006), 155–169. As Campbell argues, "Fascism employs the operational mode of the wireless system, that is, it appropriates a sort of information processing that moves through blindness and the contiguity of superimposed sound values of the wireless-gramophone hookup. Contrary to current perspectives on fascism, the fascist in my view is not simply the fascinated user of technology, or a god prosthetically extended by technology, but rather a body that has reached a certain threshold of speed by way of the spacing of vibrations and gramophonic inscription of those parts of the brain that can register" (xvii).

20. “Imperial Pocket Wireless Receivers,” advertisement, *Popular Mechanics*, May 1908, 146.

21. Burrows, “Wireless Possibilities,” 962.

22. Charles Edmund DeLand, *The Psychic Trio, or, Nations Reconciled* (Boston: Gorham Press, 1917).

23. J.D. Archer, “The Telephone Engineer’s Imaginary Mexican Escapade,” *Telephony*, 2 August 1913.

24. “Pocket Wireless Set in a Photoplay,” *The World’s Advance* 30, no. 5 (May 1915): 618. A novelization of *The Black Box* was written by E. Phillips Oppenheim (London: Hodder and Stoughton, 1917). For detailed information on the production, cast, and plot of *The Black Box*, see Carl Bennett’s *The Silent Era* database of early cinema: <http://www.silentera.com/PSFL/data/B/BlackBox1915.html>. Mark Garrett Cooper also provides a reading of *The Black Box* in *Universal Women: Filmmaking and Institutional Change in Early Hollywood* (Champaign: University of Illinois Press, 2010), 120–121. Apparently the pocket wireless was only one among “a series of fantastic technologies that assist the constantly imperiled investigators: the ‘Phototelsme, a wonderful instrument which enables the individual at one end of the telephone wire to see clearly what is happening at the other end in motion pictures’; an apparatus for ‘electric thought transference,’ allowing the memories of hypnotized persons to appear before the detective in visual form; [and] ‘anialhyde,’ a special explosive that makes shaped charges” (120–121). Other instances of pocket wireless on film include *The Great Ruby Mystery* (dir. Otis Turner, United States, 1915), *The Radio King* (dir. Robert F. Hill, United States, 1922), and *The Radio Detective* (dir. William Crinley and William Craft, United States, 1926), each of which is lost or of unknown survival status.

25. “Stories of the Films,” *Moving Picture World* 25, no. 5 (31 July 1915): 904.

26. D.W. Griffith’s 1909 Biograph film *The Lonely Villa* provides a wonderful example of the use of the telephone in the earliest days of narrative film. For more on this point, see Jan Olsson, “Framing Silent Calls: Coming to Cinematographic Terms with Telephony,” in *Allegories of Communication: Intermedial Concerns from Cinema to the Digital*, ed. John Fullerton and Jan Olsson (Bloomington: Indiana University Press, 2002), 157–192.

27. Brooks Landon, *The Aesthetics of Ambivalence: Rethinking Science Fiction Film in the Age of Electronic (Re)Production* (Westport, CT: Greenwood Press, 1992), 149. For more on this modality, see Tom Gunning, “The Cinema of Attractions: Early Film, Its Spectator and the Avant-Garde,” in *Early Film*, ed. Thomas Elsaesser and Adam Barker (London: British Film Institute, 1989). A collection of essays on the cinema of attractions’ afterlives in contemporary digital cinema was published by Wenda Strauven, *The Cinema of Attractions Reloaded* (Amsterdam: Amsterdam University Press, 2007).

28. Other instances of speculative devices in narrative films of the period include television *avant la lettre* in *Photographie électrique à distance* (dir. Georges Méliès, France, 1908); a “wireless-vision” apparatus in *Silent Evidence* (dir. E.H. Calvert, United Kingdom, 1922); a bank surveillance camera with live feed in *The Third Eye* (dir. Maclean Rogers, United Kingdom, 1929); a television set picking up a live broadcast in a sequence shot by Alfred Hitchcock in the vaudeville-style *Elstree Calling* (dir. André Charlot, United Kingdom, 1930); the “Radioscope” in *International House* (dir. A. Edward Sutherland, United States, 1933), starring W.C. Fields and Bela Lugosi; a global television transmitter transformed into a death ray in Lugosi’s more famous horror film *Murder by Television* (dir. Clifford Sanforth, United States, 1935); the “eavesdrop wireless”

in *The Man They Could Not Arrest* (dir. T. Hayes Hunter, United Kingdom, 1932); the “electric voice,” a Helmholtz resonator with destructive potential in *Fifteen Wives* (dir. Frank R. Strayer, United States, 1924); a videophone wrist-watch in *She Shall Have Music* (dir. Leslie S. Hiscott, United States, 1935); the “transceiver” capable of interrupting radio broadcasts in *You May Be Next* (dir. Albert S. Rogell, United States, 1935); and the Iconoscope, an eight-foot by six-foot television projection screen in *Television Spy* (dir. Edward Dmytryk, United States, 1939).

29. “A Glimpse into the Future,” *Popular Electricity in Plain English*, October 1909, 380.

30. Eric Kluitenberg, “On the Archaeology of Imaginary Media,” in *Media Archaeology: Approaches, Applications, and Implications*, ed. Erkki Huhtamo and Jussi Parikka (Berkeley and Los Angeles: University of California Press, 2011), 48–49, 68.

31. A 1907 handbook of electrical experiments and formulas for boys emphasizes the importance of practice over theory, foregoing any scientific explanation of wireless signal transmission. However, the book promises that practice will open up “a modern fairyland of science,” with the “powerful genie” of electricity as a guide. “Theory is all very well, but there is nothing like mastering principles, and then applying them and working out results for one’s self. . . . The boy who makes a push button for his own home, or builds his own telephone line or wireless telegraph plant, or by his own ingenuity makes electricity run his mother’s sewing machine and do other home work, has learned applications of theory which he will never forget. The new world which he will enter is a modern fairyland of science, for in the use of electricity he has added to himself the control of a powerful genie, a willing and most useful servant, who will do his errands or provide new playthings, who will give him manual training and a vast increase in general knowledge.” Joseph H. Adams, *Harper’s Electricity Book for Boys* (New York: Harper and Brothers, 1907), xi–xii.

32. “Theory of Wireless Telegraphy,” *Electrical World and Engineer* 33, no. 20 (20 May 1899): 643.

33. “Crookes’s article was read very widely—and more than that, attended to and remembered—both in Europe and in the United States; there is hardly one figure important in the early days of radio who does not at some point in his memoirs or correspondence refer to the article of 1892 as having made a difference. . . . Crookes’s article was both timely and catalytic. The year 1892 does mark a watershed. Before that, experimentation with electromagnetic waves was essentially a matter of validating Maxwellian theory; after, it became a matter of devising signaling systems, of inventions and patents, of developing a commercial technology.” Hugh Aitken, *Syntony and Spark: The Origin of Radio* (New York: Wiley, 1976), 114.

34. Sir William Crookes, “Some Possibilities of Electricity,” *Fortnightly Review*, February 1892, 176.

35. Sungook Hong, *Wireless: From Marconi’s Black-Box to the Audion* (Cambridge: MIT Press, 2001), 10–11.

36. “Science and Conjecture,” *Spectator* 67 (21 November 1891): 723–724.

37. For more on William Ayrton and Hertha Ayrton’s research on the electric arc, see Hong, 161–163.

38. In most instances, contemporary books on mobile media use this quotation in their opening sections in an attempt to essentialize the idea of wireless communication as a transhistorical mode of human interaction, ironically passing over variant strands such as the walkie-talkie, two-way radio, and pager in

the process. The following segue into Ayrton's remarks gives a sense of the approach usually taken: "Arguably, wireless communication between humans is as old as the human civilization itself, for as soon as the first humans started communicating with each other using their vocal cords, we had achieved wireless communication." Praphul Chandra, *Bulletproof Wireless Security: GSM, UMTS, 802.11, and Ad Hoc Security* (London: Elsevier, 2005), xii.

39. "Discussion" appended to Guglielmo Marconi, "Syntonic Wireless Telegraphy," *Journal of the Society of the Arts*, 17 May 1901, 516. Citing recent work by Sir Oliver Lodge in particular, Marconi sought to distance himself in this speech from what he saw as the merely derivative attempts of other technologists to achieve syntonic tuning.

40. "Wireless Telephony," *The Electrician* 49, no. 15 (1 August 1902): 597.

41. "Wireless Telephony," 597.

42. Mumford, "A Portable Receiving Outfit," 22–23.

43. Unfortunately, the significance of these magazines for the history and theorization of media has yet to be explored. Andrew Ross's reading of early science fiction as an expression of technocratic strands in early-twentieth-century progressive thought stands alone in its treatment of Gernsback as a figure of significance outside the literary genre of science fiction. Andrew Ross, "Getting Out of the Gernsback Continuum," in *Strange Weather: Culture, Science, and Technology in the Age of Limits* (London: Verso, 1991): 101–136. For the canonical accounts of Gernsback's life and influence, see Sam Moskowitz, "Hugo Gernsback: 'Father of Science Fiction,'" in *Explorers of the Infinite: The Shapers of Science Fiction* (New York: The World Publishing Company, 1963), 225–242; and Gary Westfahl, "'An Idea of Significant Import': Hugo Gernsback's Theory of Science Fiction," *Foundation* 48 (Spring 1990): 26–49.

44. Brooks Landon, *Science Fiction after 1900*, 54. The overwhelmingly disparaging tone Gernsback usually inspires in science fiction studies was probably first set by Brian Aldiss, *Billion Year Spree: The History of Science Fiction* (New York: Doubleday, 1973).