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Moving Image and Sound: Basic Issues and Training

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Vivaphone: The Half-Hearted Rise and Rapid Fall Of An Early Sound Technology

In the beginning – the beginning of the twentieth century, in this case, or more precisely the end of the nineteenth – there was recorded sound, and there were recorded moving images, and separately they changed the face of the world. In 1877, Thomas Edison developed the first working device with the capability to both capture and play back sound. In its most basic form, the phonograph consisted of a cylinder wrapped around with tin foil, rotated by a crank and attached to a diaphragm connected to a funnel and a stylus; when a voice shouted into the funnel, it caused the diaphragm to vibrate and the stylus to inscribe sound waves onto the rotating cylinder.   When another diaphragm-with-stylus passed over the indentations in the foil, the vibrating diaphragm reproduced the initial sound.[1]   This was soon followed up on by Emile Berliner's Gramophone, patented in 1887, which improved on the phonograph by having the recording stylus cut horizontally into a line of lamp-black on a record sheet to reduce resistance, then varnishing the impression left in the lamp-black and copying it in metal to create a disc for playback.[2] Later, in 1892, the ever-prolific Edison went on to unveil the Kinetoscope, a peep-show device that moved frames of film – images captured by a photosensitive emulsion on celluloid – by the use of an electrically-driven sprocket wheel. The apparatus was placed within a box, illuminated by an electric lamp blocked by a shutter to create intermittent light, and magnified by a glass through which viewers peered to see the illusion of motion being created.[3] Meanwhile, the

1   "The Soundry: A Brief History of The Recording of Sound." *ThinkQuest.com.*
    http://library.thinkquest.org/19537/Timeline.html
2   Berliner, Emile. "Gramophone." Patent 372,786. 8 November 18867
3   Walters, Jonathan. "Kinetoscope." *EarlyCinema.com,* March 2002. Web. 30 Nov 2011
    http://www.earlycinema.com/technology/kinetoscope.html

Lumiere brothers went to work on developing a means of showing moving pictures to a mass audience and created the Cinematographe in 1895, which used a projector in which light shone first through the moving frames and then through a series of lenses to launch the film image onto a screen for hundreds of people at a time to view. With this innovation, the Lumieres became known as the founding fathers an entire industry – which, with some few exeptions, was a silent one, and remained largely so for the next three decades.[4]

Despite the popular conception of sound technology as a sudden explosion in the 1920s, however, the lack of early talking pictures wasn't for lack of trying. At first, the technologies of moving images and moving sound developed largely independently of each other. Even entrepreneurs like Edison, who dabbled in both, didn't manage to marry the two until after both aspects of the technology had been unveiled individually for the public eye. However, after both film and phonographic sound had become reasonable successes in their own right, the creation of pictures that included a soundtrack seemed the next logical step, and various and sundry inventors and enthusiasts bent their attention to combining the two technologies into an artistically and financially successful whole. Edison attempted it; so did a variety of film studios in France, Germany and Denmark; and so, as a footnote in the history of talking films, did a reasonably well-known British film pioneer named Cecil Hepworth.

Born in 1874 – only a few years before the phonograph – Cecil Hepworth's credentials as an early film expert were about as impeccable as it was possible to get. He was the son of a moderately famous traveling magic lantern projectionist and quite literally grew up with the technology of moving images as it developed. He wrote the first known book on the Cinematographe in 1897, only two years after the first films were publicly projected, and then went on to found his own studio in the small English town of Walton-on-Thames. Eventually he became known as one of the premier figures of

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4 Walters, Jonathan. "Lumiere Brothers." *EarlyCinema.com,* March 2002. Web. 30 Nov 2011
   http://www.earlycinema.com/technology/kinetoscope.html

British cinema, turning out a hundred films a year, creating his own signature house style and even generating a small star system in the south of England.[5]

In these early days of cinema, when entrepreneurs were still experimenting with different technologies and techniques to get the best use out of the new technology, a producer such as Hepworth wielded enormous stylistic influence; his experiments with narrative editing and multiple-reel films were inspirational for the early British film industry, to the point where his films were described as the "leading force" in British film production.[6] Towards the end of his career, when his style had stultified, his decision to keep turning out classical silent melodramas rather than adopting more up-to-date techniques in cinematic storytelling was likewise considered emblematic of the failure of British cinema ato compete effectively with Hollywood. This is a heavy burden to lay on one man's shoulders, of course, but this history may give something of a sense of why Hepworth – primarily a producer, not an inventor – decided to dabble in talking picture technology, and also why the technology fizzled away before it ever really properly got launched. If he had managed to apply a more innovative sensibility to the use of sound technology, one imagines, Hepworth might well have led Britain into a golden age of sound a decade and a half before Hollywood climbed aboard the talkie train.

According to various different accounts, Cecil Hepworth invented the piece of sound-projection synchronizing equipment called the Vivaphone in 1909, or 1910, or 1911. In Hepworth's own autobiography, he states that he filed Patent #10417 for the Vivaphone on April 28, 1910, and was motivated in his determination to create a talking picture technology by a feeling that's probably quite familiar to all of us: he was annoyed by someone doing a shoddy job of it, and decided that he could do better.[7]   The truth is that in 1910, there were plenty of people doing more or less shoddy jobs of combining film and sound. A list of the major talking picture technologies extant around that time

5 Fisher, Bob. "The Film Explosion." *American Cinematographer,* LXX.7 (1989): 11A-15A.
6 McKernan, Luke. "Hepworth, Cecil." *Encyclopedia of Early Cinema* (2005): 297-298. *Film and Television Literature Index with Full Text.* Web. 27 Nov. 2011.
7 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 97-98

period at that time period includes:

- The Kinetophone: the earliest kind of talking picture, Edison's combination of his own technologies, developed in 1895 for use with the peep-show Kinetoscope, involved a cylinder phonograph with a motor connected via a system of pulleys to the sprocket wheel moving the film so as to govern its speed. He later revamped the Kinetophone to the point of commercial viability with projected film in 1913, and marketed it primarily on the vaudeville circuit[8]

- The Gaumont Chronophone: a combination of gramophone-style sound-on-disc and film developed in 1905 that pioneered a compressed-air amplifier used to project the sound so that talking pictures could be heard by an entire (if small) theater. An electric impulse connected the phonograph to the projector via a system of cables, controlled by the person in the projection booth who could speed up or slow both phonograph and projector together using a switchboard; provided a reasonably stable form of synchronization, but the mechanism was complicated to use and install, and often broke down[9]

- The Cameraphone: a similar sound-on-disc technology to the Chronophone, launched in 1907. Its method of amplication utilized mechanical friction for a louder sound, and it utilized a post-synchronized production in which performers lip-synced to their own recordings while being filmed so that they would not have to be constrained in their performance by standing near to a recording device that could capture their voices. It was subject to the same synchronization difficulties as the Chronophone, plus poor sound quality and stilted performances[10][11]

- The Synchroscope: a synchronized sound-on-disc technology adopted by Carl Laemmle in 1908, similar to the Chromophone and the Cameraphone, but crippled in addition by the fact

8 Rogoff, Rosalind. "Edison's Dream: A Brief History of the Kinetophone." *Cinema Journal* 15.2 (Spring 1976): 58-68
9 Manonni, Laurent, and Alison McMahon. "Gaumont Chronophone." *Encyclopedia of Early Cinema* (2005): 118. *Film and Television Literature Index with Full Text.* Web. 27 Nov. 2011.
10 Wierzbicki, James Eugene. *Film Music: A History.* New York: Routledge, 2009: 75-76
11 Ulano, Mark. "Moving Pictures That Talk." Web. 30 Nov. 2011. http://hem.passagen.se/filmljud/ulano.htm

that almost all the subjects available for the device were in German[12]

- The Cinephone: yet another sound-on disc technology, launched in 1909, which attempted to fix the synchronization problem by eliminating the connecting cables altogether, and instead having a waving pointer appear at the bottom of the picture and another attached to the side of the sound device. When the two pointers moved at the same speed, the sound and picture were in alignment[13]

It was a demonstration of the Cinephone that proved to be the trigger for Hepworth, who complained after seeing it that "the whole of the 'kitchen arrangements,' so to speak, was right before the eyes of the audience. If the synchronism went wrong they could see why."[14] Hepworth decided that there must be a way to use the same basic technology and provide some kind of equivalent visual aid for the projectionist without letting the audience so blatantly in on the trick, and, after some tinkering, came up with the Vivaphone synchronization device to solve the problem.

At its heart, the Vivaphone was not really particularly different from any of the other hordes of synchronized sound-on-disc talking picture technologies that proliferated around this period. A projector played the film and a gramophone player broadcast a record of the sound, with the greatest difficulty being to keep the two in time. The key feature that marked the Vivaphone's uniqueness was the synchronizing box that hooked up the projector and the gramophone, which was meant to replace the Cinephone's wagging pointer. There were marked starting points on the film and the phonograph record to ensure that they began at the same time – without this, of course, the whole operation would fail from the beginning. The gramophone moved at a set speed thereafter, and the projectionist was meant to keep his eyes on the synchronizing box to tell whether he was moving too fast, too slow, or just right, using a needle that was designed to swing to one side or the other if the projectionist got out of time with the gramophone player.

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12 Eyman, Scott. *The Speed of Sound: Hollywood and the Talkie Revolution.* New York: Simon and Schuster, 1997: 29-30
13 Wierzbicki, James Eugene. *Film Music: A History.* New York: Routledge, 2009: 76
14 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 97

The first thing that happened when the synchronizer was switched on was simply that it light up. An electric bulb in the middle shone through a red bulls-eye on the side facing out, signaling to the gramophone operator that the projectionist was ready to go and he could start up the sound. On the other side, the side facing the projectionist, the light issued through through an aperture covered by a needle. The gramophone had a skeleton casting over it mounted with a magneto – an electrical generator that produces an alternating current by the use of permanent magnets, similar to what was used on early telephones – that was attached to the synchronizer by a double-bell wire. The turning of the disc sent an electrical current down the bell wire that set the synchronizing box to ticking steadily in time with the rotations of the phonograph. The first tick signaled to the projectionist that it was time to start turning the handle of the projector. The handle of the Vivaphone was a special attachment that was also linked to the synchronizer by wire; it established an electrical current which was designed so that if the projector turned the handle too fast, the magnetic force of the machine of the machine generated by its speed pulled the needle to the left. If the projectionist turned too slowly to catch up with the phonograph, on the other hand, the magnetic force of the phonograph speed as channeled through the magneto pulled the needle to the right.

Behind the needle were two helpfully color-coded glass windows – a red one set to the left that was revealed when the projectionist was going too slow, and a green one next to it when he went too fast. The windows lit up with the light from the internal electric bulb that was revealed when the needle was pulled aside, so all the projectionist really needed to know were the colors for 'fast' and 'slow' to get how the machine worked. The electric force for the whole thing came from a battery, and the goal was to keep the needle straight up.[15] Because only the projectionist and the person in charge of starting up the phonograph could see the synchronizing box and the needle, this at least spared the theater the embarrassment of having the audience watch as the phonograph and projector visibly went

15 Hoffman, Hugh. "The Talking Picture: A Review of Some of the Synchronizing Systems Now in the Market," *The Moving Picture World* Vol. 16, 1347-1348.
http://www.archive.org/stream/movingpicturewor16movi/movingpicturewor16movi_djvu.txt

out of time with each other – although, of course, they could still hear the muddled effect of the out-of-sync sound.

Hepworth's personal rallying cry during the invention process may well have been "It's better than the Cinephone," but this was probably not the most tactful way for a well-known figure to market a new talking picture technology. Fortunately, the Vivaphone had other selling points to recommend it. Perhaps most attractive feature for the cinema palace looking to potentially invest in sound pictures was the fact that a minimum of special mechanical pieces were required to get the full effect. The Vivaphone was portable and easy-to-use, marketed as requiring only "half a day" of training and sold in a handy little kit that consisted of "synchronizer, gramophone attachment, projector handle, coil of wire, and a four-volt battery".[16] This stood in stark contrast to mechanized synchronizing technologies such as the Kinetophone and Chronophone. The Chronophone, which only needed one operator rather than separate technicians for the projector and the gramophone, stood a better chance of eliminating human error once the apparatus was working correctly, but, as the *Moving Picture World* points out, the device was "complicated and it is doubtful whether very many operators could be found who have the necessary mechanical knowledge to successfully manipulate it,"[17] making it much less appealing as a commercial item.

In addition to their complexity, both the Cinephone and the Kinetophone were bulky and complicated to carry and install; indeed, the Kinetophone required a specifically Edison-produced projector and phonograph in order to operate. The entire Vivaphone apparatus could be hooked up to any existing projector and phonograph, rather than requiring an expensive investment in new equipment, and removed just as easily to allow the theater to return to playing silent films. This meant that the shorts could be marketed to legitimate movie theaters rather than being relegated to the

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16 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 98
17 Hoffman, Hugh. "The Talking Picture: A Review of Some of the Synchronizing Systems Now in the Market," *The Moving Picture World* Vol. 16, 1347-1348.
   http://www.archive.org/stream/movingpicturewor16movi/movingpicturewor16movi_djvu.txt

vaudeville circuit along with the Kinetophone, although the fact that amplification technologies were still in the early stages meant that those theaters would have to be small. Moreover, the prolific Hepworth could assure buyers that there was no risk of running out of new Vivaphone material – always a danger with sound systems, since there was no use in having a sound system without anything to play on it – as he was producing two new Vivaphone shorts at his studio per week. On the whole, it seemed an attractive proposition; a *Motion Picture World* reporter, in 1913, wrote enthusiastically that the whole thing was "extremely simple," that it "could be made ready for operation in twenty minutes" and that "anyone who can operate a Victrola at home can operate one with this device."[18] As far as early sound systems went, it seems to have been no worse than most and certainly better than many, and designed with an eye to ease of use and widespread adoption.

And indeed, despite the fact that Cecil Hepworth was known specifically as a specifically British filmmaker working within the British system, the Vivaphone did have a brief but energetic life on both sides of the Atlantic. In fact, the American partner who was licensed to introduce the Vivaphone in the United States may well have been more invested more energy in the enterprise than Hepworth himself. Alfred Blinkhorn formed the Vivaphone and Films Sales Company, based in New York, and seems to have been extremely active at least through 1913, taking out no less than eleven advertisements in the April-June edition of *The Moving Picture World* periodical and ten more in the July-September issue. However, by the time the October-December issue came out, his output had slowed to three, and by 1914 mentions in the periodical of Mr. Blinkhorn and his Vivaphone Company had disappeared completely.

Of course, Blinkhorn's announcements about the success of the Vivaphone, as trumpeted in these ads, seemed to stretch the truth more often than not. He claimed that the device had had "five

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18 Hoffman, Hugh. "The Talking Picture: A Review of Some of the Synchronizing Systems Now in the Market," *The Moving Picture World* Vol. 16, 1347-1348.
    http://www.archive.org/stream/movingpicturewor16movi/movingpicturewor16movi_djvu.txt

years of tremendous success in the leading photo-play theaters of Great Britain and Ireland"[19] – a temporal impossibility in 1913, since the machine was only patented, according to Hepworth himself, in 1910 – and, in another ad, that an impressive "four hundred theaters" had adopted it in the United Kingdom[20]. He also contradicted himself several times over the course of one issue; although he repeatedly claimed that there was a library of five hundred short Vivaphone pieces in existence, his attempts to sweeten the pot led him first to announce that there were two new Vivaphone pieces being produced per week, then three, then four, and, in one final extravagant claim at the end of the April-June issue, six shorts per week. One might imagine that a movie theater owner, flipping from the ad in the front of the periodical to the one in the back, might find themselves in the grips of some confusion about how many Vivaphone shorts were actually coming out of the Hepworth studios.

Nonetheless, the frenzy of advertising did seem to have some effect; independent updates in the July-September issue, directly after Blinkhorn's first leap into the world of talking pictures, confirmed that exhibitors in Philadelphia were "showing a keen interest" in the technology[21] and that Hiram Abrahams, "the big moving picture man of Portland, Massachusets," had snapped up Vivaphone rights in New England for his chain of twenty movie theaters[22]. Blinkhorn himself took ship for Europe around the same time and announced his intention to annex several other foreign brands to add to his company. What became of all this apparent burgeoning success is hard to decipher; perhaps he simply never came back.

However bogus Blinkhorn's claims might have been, he nonetheless displayed more passion for the Vivaphone over the course of six months than Cecil Hepworth did over the course of a career. Hepworth seems to have seen the Vivaphone as simply a frivolous experiment when weighed against

19 Advertisement, *The Moving Picture World,* Volume 16, 423.
   http://www.archive.org/stream/movingpicturewor16movi/movingpicturewor16movi_djvu.txt
20 Advertisement, *The Moving Picture World,* Volume 16, 883.
   http://www.archive.org/stream/movingpicturewor16movi/movingpicturewor16movi_djvu.txt
21 "Philadelphia," *The Moving Picture World* Vol. 17, 441
   http://www.archive.org/stream/movingpicturewor17newy/movingpicturewor17newy_djvu.txt
22 "New England and Canada," *The Moving Picture World* Vol. 17, 439
   http://www.archive.org/stream/movingpicturewor17newy/movingpicturewor17newy_djvu.txt

his main business of creating silent motion pictures, an "interesting little side-line" and a "little flirtation that might or might not lead to more serious things".[23] In this case, the 'might not' won out. Some sources claim that Vivaphone shorts were being produced and demonstrated from the Walton-on-Thames studio as late as 1922[24], but Hepworth's autobiography states that the Vivaphone "only had a short life of three or four years"[25] – which would give it a death date of 1913 or 1914, and imply that perhaps the reason for the disappearance of Brinkhorn's operation in the United States was Hepworth's lack of interest in producing any more Vivaphone material. The later Hepworth was certainly rather dismissive of the Vivaphone work, stating to the imagined reader of his autobiography that "you wouldn't have liked [the shorts] even if they had been any good,"[26] and without a steadily-increasing library of two, or four, or six pieces a week, Brinkhorn would have much less of a leg to stand on in promoting the product.

Hepworth may or may not have been right about his estimation of the quality of the Vivaphone shorts. Certainly, as far as anyone can tell, the need to feed the Vivaphone produced no great or deathless works of art. Brinkhorn, in his *Moving Picture World* ads, promoted materials such as "Jimmie Valentine," the "Toreador Song from Carmen," "The Chocolate Major," and "The Wearing of the Green"[27] – short musical pieces only, since the amount of sound that could be crammed onto a gramophone at the time did not allow for anything lengthy. Hepworth did find one rather unique use for his new sound technology, however: long before the era in which politicians could be reasonably expected to be stars of the large and small screen, he was partnering with British politicians to experiment with using his new sound technology to record post-synchronized speeches. Bonar Law may have been the shortest-serving Prime Minister of the 20th century, but at the time that he drove out to Walton-on-Thames to play around with the Vivaphone, he was a respected Leader of the Opposition

23 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 98
24 Gomery, Douglas. *The Coming of Sound: A History.* New York: Rutledge, 2005, 27
25 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 99
26 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 99
27 Advertisement, *The Moving Picture World,* Volume 16, 855.
   http://www.archive.org/stream/movingpicturewor16movi/movingpicturewor16movi_djvu.txt

in the British Parliament, and the fact that he took the time to "make a journey to the Gramophone Company and deliver his speech into a long funnel...and then come out to our studio and re-deliver it word by word in step with his own record on the gramophone attached to our camera"[28] was quite a feather in Hepworth's cap. Hepworth considered it a "moment of glory" for the technology, and went on to coax several other Cabinet ministers to repeat the process. This interest in political cinematography eventually led him to launch an effort to film an entire Cabinet session, but unfortunately the ministers seem to have gotten cold feet, worrying that their constituents would find it undignified of them to be sitting for the camera. Obviously this concern seems rather ironic to us now, and it seemed so to Hepworth even at the time, but it nonetheless scotched his budding career as a political cinematographer.

In short, the vision of the Vivaphone as a game-changer in the world of British politics was not enough to keep the new sound technology afloat. As for why it failed – that's a question with a number of different answers. Some sound historians have tended towards the simple explanation that the device simply did not work very well – that despite its trumpeted ease of use, it simply failed in its purpose too often to be worth the price of investing.[29] (There was also, apparently, a danger of spontaneous combustion when metal came into contact with the battery, which Hepworth mentions merely as a funny story in his autobiography, but which must have been a somewhat disconcerting anecdote for professionals working with nitrate film to learn about.) Hepworth himself was inclined to blame shoddy technicians, claiming that the machine's frequent malfunctions occurred because "the boy was careless about putting the gramophone needle into the proper place on the record"[30]. No matter how low one's opinion of youthful gramophone operators, however, it seems easier to believe that the machine or the instructions were confusing than that hordes of incompetent employees were sabotaging an otherwise functional device.

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28 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 99
29 Gomery, Douglas. *The Coming of Sound: A History.* New York: Rutledge, 2005, 27
30 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 104

Hepworth's other and more plausible explanation was that the shine had simply worn off the rose, and, once talking pictures were no longer novel, audiences became bored with sound-synchronization antics and wanted to return to the standard silent cinema to which they were accustomed. It does seem to be true that the second decade of the twentieth century provided an inhospitable climate for synchronized sound-and-film systems. The 1910's are a veritable graveyard of abandoned talkie technology; the Kinetophone, the Chronophone, the Cinephone, and countless others all faded away into obscurity as surely as the Vivaphone. The general assumption is that, technical difficulties aside, the studio system at the time was not particularly interested in embracing talking pictures, due to concerns that introducing a language barrier would limit the global marketability of their films. Instead, the studios focused their attention on musical accompaniment and sound effects that could be provided by a pianist or sound technician in the movie theater.[31]   Talking shorts, while entertaining, did not offer much competition for a full-length narrative film complete with live serenades and crashing thunder.

However, just because the talkies of the teens never did get off the ground doesn't mean that it was impossible for them to do so, and, once again, I find myself reluctant to let Cecil Hepworth as much off the hook for responsibility in the failure of the Vivaphone as he would like to be. First of all, any inventor who talks about his invention as falling out of favor "as it was bound to do"[32] clearly does not have a huge investment in the project; as any pop-psychology book will tell you, negative thinking is the surest way to defeat. Hepworth simply didn't seem to care enough to make the technology a success. This may tie somewhat into his fatal flaw as a filmmaker, for although he started out his career as an innovator in film techniques and technology, he eventually became so wedded to his early style that he stopped innovating and fell behind the times and into obscurity. The bankruptcy of his studio in 1924 occurred largely because he bet the fortunes of his company on an epic film in his usual

31 Altman, Rick. "The Sound of Sound.: A Brief History of the Reproduction of Sound in Movie Theaters." *Cineaste,* 21.1
      (1995): 68-71.
32 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 99

old style – a remake, in fact, of one of his older films – that the audiences of the early twenties found slow, stagnant and out-of-date.[33]   It is unsurprising, therefore, that he never really paid much attention to the possibilities of the Vivaphone as a tool with which to advance the art of moving pictures.   The Vivaphone shorts that came out of Walton-on-Thames seem to have been utterly standard and unmemorable, with the exception of the political speeches, and even those could probably not be considered glorious artistic achievements.

A decade and a half after Hepworth pioneered the Vivaphone, Warner Brothers launched a subsidiary company to promote their new talking technology, the Vitaphone. A sound-on-disc system in which the projector was mechanically linked to the phonograph player to keep the two in time, the Vitaphone was not substantially different from any of the others that had come before it, although its superior amplification, using De Forest's Audion vacuum tube, allowed it to more easily fill a theater with sound. The key difference between the Vitaphone and its predecessors lay in the way that Waner Brothers used their new technology. Rather than sticking to singing shorts, they experimented with using multiple discs to provide sound during key moments in full-length motion pictures. Although the Vitaphone didn't really stick around all that much longer than the Vivaphone did, fizzing out before the beginning of the 1930's in the face of competition from optical sound-on-film technologies – it did, after all, have all the same flaws as the failed technologies that came before it – it will forever be known as the system that brought about the sound revolution, thanks to the much-mythologized talkie *The Jazz Singer.*[34]

If Hepworth had experimented more with innovative ways to integrate sound into film, as the Vitaphone did with *The Jazz Singer,* could the Vivaphone have helped to usher in the talkie revolution a decade earlier? The writers of the time seemed to think so; the journalist at *The Moving Picture World* who reviewed the Vivaphone and several other early sound systems in 1913 turned his article into a

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33 "Cecil Milton Hepworth: British Film Pioneer." Web. 11/30/2011. http://www.hepworthfilm.org/the_man.htm
34 Wierzbicki, James Eugene. *Film Music: A History.* New York: Routledge, 2009: 92-93

general plea for better quality talking picture entertainment, writing that "mechanically the talking picture is a success. Now it is up to the promoters to make it an artistic success."[35] When it came to Hepworth, this plea fell on deaf ears, but it's certainly enough to make one wonder what might have been if Hepworth had been willing enough to be flexible with his content – especially considering that the Vivaphone's last gasp as a useful piece of technology took quite a bit of innovation and outside-the-box thinking in its own right.

According to his autobiography, Hepworth rediscovered the Vivaphone when he was experimenting with double-photography techniques in a film called *Anna the Adventuress,* in which one actress played against herself as her own twin sister. In double-photography, the film was shot with a covering over half the lens, then rewound back to its origin; the lens cover was switched to the other side, the actress hastily switched costumes, and the film was shot once again with light now falling on the half of the picture that had previously been covered by the lens. The difficulty in the technique was ensuring that the film recorded the second time around at the same speed as it had the first time, and that the actress timed her reactions well enough against her imaginary screen partner to make their interaction convincing. Hepworth struck on the idea of making an audio recording of the filming of the scene on a phonograph record, capturing his instructions to the actress as she played Twin Sister #1. The phonograph record and player was then hooked up to the camera using the Vivaphone. Then, when filming the second time for the double-photography technique, the actress was able to use the recording to react with exactly the correct timing as Twin Sister #2, and the photographer could watch the Vivaphone to make sure that he was recording at the correct speed and one "twin" would not be moving distressingly faster or slower than the other. Hepworth called this use of the Vivaphone "a more worthy re-birth in a sphere of actual utility,"[36] thus dismissing the original purpose of the

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35 Hoffman, Hugh. "The Talking Picture: A Review of Some of the Synchronizing Systems Now in the Market," *Moving Picture World* Vol. 16, 1347-1348.
   http://www.archive.org/stream/movingpicturewor16movi/movingpicturewor16movi_djvu.txt
36 Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951, 171-172

Vivaphone – the creation of talking pictures – for once and for all.

In a way, this quote sums up both the potential of the Vivaphone, and its nearly inevitable failure. Hepworth was a gifted film pioneer, and his revivification of the Vivaphone in order to experiment with visual photographic techniques is an excellent example of the kind of creativity that he was capable of. If he had taken his invention at all seriously, and been willing to experiment with new forms of narrative instead of pretty visual tricks, he might have been able to channel that creativity into something that would have made the Vivaphone memorable But he seems instead to have been prejudiced against it from the start; he never thought that the Vivaphone could be anything other than a novelty, and therefore it never was.

Hepworth would have been unsurprised to learn that it's well-nigh impossible to find a surviving Vivaphone machine or any Vivaphone shorts today. This is in large part due to the sale of the studio in Walton-on-Thames after the company's bankruptcy in 1924, which resulted in all of Hepworth's original negatives being melted down for their silver content – a tragedy for more reasons than just the loss of the history of the Vivaphone. The only institution that lists any Vivaphone material in their collection, as far as I have been able to discover, is the Ronald Grant Archive and the Cinema Museum in Londo;[37] unfortunately, they have so far not responded to my inquiries to try and determine exactly which pieces they possess, or whether they have the film strips that accompany them. Otherwise, the Vivaphone seems to have nearly vanished from the historical record. Even works that focus on the earliest sound technologies mention it only in passing, one in a vast list of nearly indistinguishable failed innovations.

So why remember the Vivaphone at all? The answer, I think, is that we can learn from failures as much as we can from successes. If history only considered the successes, like the Vitaphone, there would be no way to discover what distinguishes the technologies that die from the ones that evolve and

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37 Slater, Jim, and Nigel Wolland. "The Ronald Grant Archive and the Cinema Museum." *Cinema Technology,* 21.1
   (1998): 18-22

survive. Tied as it is to the history of a major early cinema figure who clearly documented his own thoughts about the process, it's easy to look at what might have been and formulate theories about what went wrong. In short, the history of the Vivaphone is inspirational in its lack of inspiration.

Annotated Bibliography

Abel, Richard, Ed. *Encyclopedia of Early Cinema* (2005). *Film and Television Literature Index with
Full Text.* Web. 27 Nov. 2011.

I found this encyclopedia extremely helpful for providing both technical information on early
sound devices, and evenhanded biographical information on the leading personages of the time.
The article on Cecil Hepworth provided an excellent overview of his career and importance to
British cinema.

Altman, Rick. "The Sound of Sound.: A Brief History of the Reproduction of Sound in Movie
Theaters." *Cineaste,* 21.1 (1995): 68-71

This resource is indeed "brief," and focuses more on the viewpoint of the studios than on
the technical qualities of the sound systems – but of course sometimes this is the information
that one is looking for.

Assorted advertisements, *The Moving Picture World,* Vols. 16-17. April-September, 1913
http://www.archive.org/stream/movingpicturewor16movi/movingpicturewor16movi_djvu.txt

The ads taken out by the American Vivaphone and Film Sales company, while not a
source of necessarily accurate information about the Vivaphone, were invaluable in putting
together the timeline of the Vivaphone's life cycle as a viable technology being used in the
United States.

Barnier, Martin. "The Controversy over the 'Invention' of the Talking Picture." *Film History,* XI.4
1999: 477-484

This article provides an interesting discussion of whether the Kinetophone in the context
of its exclusive use in vaudeville palaces, which offers a potentially different perspective on
whether talking pictures could have been considered to be in real 'competition' with the silents.

Berliner, Emile. "Gramophone." Patent 372,786. 8 November 18867

Berliner's patent describes the workings of the gramophone, and what distinguishes it

from the earlier phonograph, in great and helpful detail.

Enticknap, Leo. "De Forest Phonofilms: A Reappraisal." *Early Popular Visual Culture*, 4.3 (2006): 273-284

> This is a good resource for learning about early optical sound-on-film, although ultimately I decided not to reference it, since Phonofilm came too late to be in direct competition with the Vivaphone.

Eyman, Scott. *The Speed of Sound: Hollywood and the Talkie Revolution.* New York: Simon and Schuster, 1997

> While a good resource in general for learning about the history of sound coming to the cinema, this only discusses the Vivaphone as a footnote.

"Cecil Milton Hepworth: British Film Pioneer." Web. 11/30/2011. http://www.hepworthfilm.org/the_man.htm

> This is essentially a Cecil Hepworth fansite. The information is not exactly peer-reviewed, but they do provide links to further resources and serve as a good starting point for finding out more information on Hepworth.

Gomery, Douglas. *The Coming of Sound: A History.* New York: Rutledge, 2005

> One of the few general sources on early sound that discusses the Vivaphone in any depth, Gomery's book provided a good starting point for looking at the Vivaphone's history, although some of his information proved to be of dubious accuracy.

Hepworth, Cecil. *Came the Dawn: Memories of a Film Pioneer.* London: Phoenix House, 1951

> One of my most valuable sources for this project, this engaging autobiography provides a light and witty treatment of Hepworth's career in the film industry, including approximately a chapter dealing with his invention and use of the Vivaphone. The account is of course a biased one and not all the claims can be taken at face value, but as a firsthand source for what was going through Hepworth's mind throughout the process, it can't be beat.

Hoffman, Hugh. "The Talking Picture: A Review of Some of the Synchronizing Systems Now in the

Market," *The Moving Picture World* Vol. 16. April-July 1913, 1347-1348.

http://www.archive.org/stream/movingpicturewor16movi/movingpicturewor16movi_djvu.txt

This article from 1913 provided not only an incredibly detailed description of the workings of the Vivaphone (as well as the Kinetophone and the Chronophone), but a really useful sense of what contemporary audiences felt about early sound technologies. This, along with Hepworth's autobiography, was probably my most valuable source for writing the paper.

"Philadelphia" and "New England and Canada," *The Moving Picture World* Vol. 17. July-September, 1913. http://www.archive.org/stream/movingpicturewor17newy/movingpicturewor17newy_djvu.txt

These short overviews of regional happenings in the film world in 1913 provided snippets of information about the adoption of the Vivaphone and the activities of Vivaphone sales agent Blinkhorn.

"Proceedings of the British Kinematograph Society," June 1, 1933

Unfortunately, this resource seems to have been taken down from the Web since I accessed it a few months ago; it provided an interesting discussion of some of the early sound systems from a period almost directly after the permanent transition to sound, and also discussed some of Hepworth's films as part of a tribute (since Hepworth was in the audience of the Society at the time.)

Rogoff, Rosalind. "Edison's Dream: A Brief History of the Kinetophone." *Cinema Journal* 15.2 (Spring 1976): 58-68

Aside from providing some valuable history and description of the Kinetophone, this article is also interesting for the devices that it presents as the Kinetophone's major competitors: the Chronophone, which is an obvious choice, and the Biophone, which as far as I can tell was extremely marginal.

Slater, Jim, and Nigel Wolland. "The Ronald Grant Archive and the Cinema Museum." *Cinema Technology,* 21.1 (1998): 18-22

This write-up of the Ronald Grant Archive, while not particularly relevant for any technical information, did provide an offhand mention of Vivaphone records as included in the collection – the only proof I found anywhere that some Vivaphone content might still be in existence.

"The Soundry: A Brief History of The Recording of Sound." *ThinkQuest.com.*
http://library.thinkquest.org/19537/Timeline.html

This basic resource is useful for a general overview, and for information about major devices such as the gramophone, but tends to ignore the existence of lesser-known innovations; for example, it identifies the revamped Kinetophone, which came out in 1913, as the first talking-film technology.

Ulano, Mark. "Moving Pictures That Talk." Web. 30 Nov. 2011. http://hem.passagen.se/filmljud/ulano.htm

A writeup of a talk initially delivered to the California Antique Phonograph Society, this resource, while not the most scholarly, clearly shows a love for the material and provides a good synthesis of the story of early sound technology, speckled with a lot of interesting trivia

Walters, Jonathan. *EarlyCinema.com,* March 2002. Web. 30 November 2011. http://www.earlycinema.com

This website provides an overview of many of the most important names and technologies in early cinema, including a biographical page focused on Cecil Hepworth. It is not particularly in-depth, but offers useful and accurate information.

Wierzbicki, James Eugene. *Film Music: A History.* New York: Routledge, 2009

Like many of the books on early sound cinema that I consulted, this book provides useful overviews and trends, and describes the major players among the early talkie technologies (Kinetophone, Chronophone) but mentions the Vivaphone and other more marginal systems no more than in passing.