

Noise in its Contexts at the Dawn of Sound Cinema

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An advertisement for Fox Movietone Features from 1929 proclaimed, “Gone are the days when talking pictures could hope to succeed on novelty alone. The speaking screen has reached maturity—its infant days are over. Noise is through as a box office attraction.”¹ This advert reveals much about its moment in American cinematic sound history: that sound had moved beyond novelty, acoustical standards were now established, and the “speaking screen” of Fox Movietone Features marked a clear break from the primitive “noise” of American cinema’s acoustical infancy. Yet, there is no denying that sound encompasses more than just dialogue—other acoustical dimensions (not only music) remained. The question remains, therefore: if we acknowledge that noise wasn’t entirely eclipsed with the arrival of synchronized sound, how exactly was noise articulated during cinema’s transition to synchronized sound?

This essay investigates noise as a dimension of American cinema’s sonic repertoire, charting its variations during the shift to sound cinema between 1926 and 1932. While the arrival of synchronized sound should not be reduced to the release of *The Jazz Singer* in 1927, the time range under discussion accords with seminal investigations focusing on American cinema’s conversion to sound.² My focus is on trade discourse; noise was a hot topic in these pages, as industry discourse sought its elimination. References to noise surfaced in relation to principles of textuality (activity onscreen) and, even more so, in relation to spatiality (action within the theater). These topoi throw into relief how the implementation of sound in its pro-filmic manifestation corresponded with the purported excision of noises that threatened to disrupt the signal of what was shown onscreen.

These two guiding principles—acoustic spatiality and textuality—anchor the cottage industry pertaining to noise within sound studies. Regarding the former, R. Murray Schafer situates noise as a disruptive element within a “soundscape” (referring to “noise pollution”), a term he coins in reference to an “acoustic environment.”³ Emily Thompson reactivates Schafer’s phraseology with her analysis of the “soundscape of modernity.”⁴ Key to these analyses is that noise threatens its acoustic landscape. These references to the spatial character of noise also gesture at the imbrication of noise within regimes of power across a given landscape, a consideration central to Jacques Attali’s work on noise. Attali juxtaposes noise against music, contending that music reflects the ideology of the dominant group, while noise offers the capacity for conjunctural moments of resistance, such that “every noise evokes an image of subversion.”⁵ Nora Alter and Lutz Koepnick generally corroborate Attali’s conclusions, arguing that controlling noise comprises a key ingredient in the regulation of subjects under capitalism.⁶

Analyses more grounded in aesthetic theory have tended to explore noise’s centrality within the acoustic avant-garde. Douglas Kahn, for example, argues that “Of all the emphatic sounds of modernism, noise is the most common and the most productively counterproductive.”⁷ Kahn does not focus on cinema in particular, but Michel Chion, in one of the few discussions of noise in cinematic sound theory, argues that noise has unjustifiably lain dormant among academics: “but noises, those humble footsoldiers, have remained the outcasts of theory, having been assigned a purely utilitarian and figurative value and consequently neglected.”⁸ Kahn and Chion attend more to the formal qualities of noise onscreen, and less to its situatedness within either the landscape of the movie theater or culture more broadly. The primary literature surveyed in what follows, by contrast, refers to noise primarily in relation to spatiality (sounds within the theater), as the industry sought techniques through which to suppress

ambient noise in the interest of preserving sound onscreen. The trade journal perspective reveals a parallel between noise elimination strategies within the broader “soundscape of modernity” and the more localized soundscape of the movie theater. Trade rhetoric illuminates the machinery shaping the cinematic soundscape, exposing how the handling of noise was bound up in shifting exhibition practices (between cinema’s presentational period and its standardization), as well as—on the level of taste politics—the construction of an acoustic spectator discriminating enough not to tolerate noise. Noise was seldom embraced as a component of the text, far removed from the modernist formulations discussed by Kahn. Consequently, trade discourse also invites us to imagine what might have been, had noise been embraced as a key ingredient within the pro-filmic event. This discussion begins with a survey of broader social soundscapes of the time, before progressing to ambient noise within the theater, noise as a component of the text, and finally, noise as film promotion.

The Social Construction of Noise in Modernity

Industry discourses concerning noise suppression existed against the backdrop of broader social contexts of noise suppression. Emily Thompson, for example, locates the importance of noise within the “soundscape of modernity,” a locus that “is simultaneously a physical environment and a way of perceiving that environment; it is both a world and a culture constructed to make sense of that world.”⁹ Thompson emphasizes the social construction of sound:

...with industrialization, however, new kinds of noises began to offend. The sound of the railroad, for example, became a new source of complaint. The noise of its steam whistle was disturbing not only for its loudness but also for its unfamiliarity... When New Yorkers were polled in 1929 about the noises that bothered them... The ten most troubling noises were all identified as the products of “machine-age inventions, and only with number eleven, noisy parties, did “the sounds of human activity enter the picture.”¹⁰

As Thompson suggests, modernity initiated a novel soundscape forcing Americans to contend with unfamiliar sounds. The distinction between modern and pre-modern noise grew more pronounced with acoustic quantification methods, including the calculation of decibel levels. Thompson notes how such capabilities led to persistent attempts to combat noises—or resign to them by spending more time in the private refuge of apartments:

Thus, while noise has always been a companion to human activity, and while it has always been a source of complaint, the particular problem of noise in early-twentieth-century America was historically unique. The physical transformation of the soundscape, as well as the social and cultural transformation taking place within it, combined to create a culture in which noise became a defining element. Noise was now an essential aspect of the modern experience.¹¹

Here “the modern experience” refers to a particular connotation of modernity linked to urbanity, technological progress, and ephemera. Thompson does not consider alternate ways in which sounds were received in rural environments, but the urban “soundscape of modernity” that she locates—with its ambivalence toward ambient sound—identifies the general context in which sound films were first received.

Thompson’s explication also highlights how the “soundscape of modernity” involved both the social construction of sound and the restriction of noise. Studies by Thompson, John Picker, and Karen Bijstervald have identified noise suppression initiatives within 1920s urban America.¹² In 1930, the Noise Abatement Commission of New York formed, aiming to curb city noise and educate the public on distinctions between proper and distasteful sound. Unsurprisingly, the Commission was unsuccessful; Thompson notes, “By demonstrating the power of modern technology to measure and map city noise, the commission misled the city into thinking that its engineers could just as easily eliminate it.”¹³

That the commission existed speaks to increasingly discriminating attitudes toward sound. Such initiatives did not promote silence but sought to distinguish between sound and noise—with sound referring to acoustically significant material and noise connoting disruptive (often ambient) sounds. As composer Henry Cowell noted in 1929 in relation to music, “If a reviewer writes ‘It is not music, but noise,’ he feels that all necessary comment has been made.”¹⁴ Noise signified harshness and contingency, while music connoted deliberateness.

Such acoustic discrimination offers a clue as to why sound engineers were so valued during the American cinema’s transition to sound, and why *JSMPE* (*Journal of the Society of Motion Picture Engineers*) was home to the richest discourse concerning noise. By the mid-1920s, sound acquired a rational connotation. Noise became identifiable and quantifiable, and citizens distinguished between

sounds offering narrative utility or aesthetic virtue and those serving no purpose. Technological specialists, then, were required to eliminate it.

Noise within the Soundscape of the Movie Theater

Noise held many meanings during the 1920s and was mainly framed as an item for removal. Developments in eliminating noise were hailed as triumphs, not only in *JSMPE* but also *Film Daily*, *Motion Picture News*, and other industry journals. It is no accident that in November of 1931, ERPI received an Academy Award for its noiseless recording technique. According to Don Crafton, "The acoustic engineers' challenge was to curb the microphone's hunger for all sounds and to make mikes more palatable...sound was treated as something to be domesticated rather than spotlighted in its own right."¹⁵ Over time, standards for volume developed; an article in *Film Daily* from December of 1930 notes:

The desirability for conservative volume should be obvious. The ground or surface noises that are part of the talking picture, as the phonograph's needle's scratching is part of the talking machine, is emphasized by volume. This is especially true where there are many silent stretches in the picture. Lower volume, on the other hand, tends to obliterate these noises.¹⁶

Antipathy toward noise, then, extended to the movie theater and the regulation of volume therein. In 1929, S.K. Wolf, an acoustical researcher, analyzed 500 theaters for their acoustics. His findings were revealed in an article that was printed in *Film Daily* and *Motion Picture News*, wherein he argues that patrons would not tolerate noise:

Theater patrons will not listen to extraneous noises and echoes. Freedom from outside noises is a matter of attention. Ventilating ducts to the theater auditorium should be insulated to avoid interference with sound pictures. The motion picture projection room should be noiseless of the sound picture audience.¹⁷

The reference to a "sound picture audience" suggests that silent cinema audiences may have been more tolerant of sound, as if the arrival of synchronized sound corresponded with the construction of an increasingly discriminating acoustic viewer. Wolf's rhetoric also recalls the aforementioned disdain for noise that emerged in the early years of the twentieth century, a correspondence between broader social soundscapes and the soundscape of the movie theater.

In an article from around this time, R.H. McCullough of Fox West Coast Theaters expresses similar sentiments to Wolf, noting, "Theater patrons never became accustomed to noise. Good acoustics are as essential as proper ventilation and illumination. No matter how well the production may be directed with good sound, it will be ruined in an auditorium with poor acoustics."¹⁸ Interestingly, this remark speaks of noise in the past tense, recalling the advertisement that initiated this discussion.

Likewise emphasizing the importance of eliminating noise, Wolf proposes practical solutions:

Generally speaking, the theater with an almost square auditorium produces sound with the best results. The theater in which it is most difficult to get good sound reproduction is the long, narrow theater with a low ceiling. The presence of rugs and carpets improves sound reproduction...Any noise which is made in an empty auditorium should let you know where the reverberation takes place.¹⁹

Here Wolf alludes to the quantification of noise that emerged in preceding decades, and promotes nullifying ambient noise. The following year, he notes that improvements to the viewing environment could curb audience noise:

Audience noise is of two kinds. The first includes whispering, coughing, laughing, rattling of programs, etc., and is not controlled by the exhibitor. The other, scuffling of feet on concrete floors, is controllable and eliminated with the use of carpet. Further noise is often introduced into a theater by and through the ventilation theater, and street noises sometimes enter through this channel. This, too, is controllable. Tests have shown that if the aggregate noise is 20 per cent as loud as the sound, the articulation will be reduced to noise.²⁰

Wolf's declaration is not entirely empirical, despite his references to percentages and tests; quantifying the relationship between noise and sound necessitates drawing arbitrary distinctions between them. There was also no delineation distinguishing noise contra appropriate sound or volume level. L.T. Robinson of the General Electric Company, for example, noted in 1929 that operators routinely projected sound loudly, but also conceded that depending on the action onscreen, higher volumes were sometimes necessary. If films were screened too loudly, this might reduce the ratio of noise to sound, but might also make the picture too loud.²¹

Distinctions between audience sound and onscreen noise call attention to the aggregate collection of noises that inform the viewing experience and comprise what Rick Altman refers to as the “social materiality” of the viewing experience.²² Altman’s phrase, attesting to the spatiality of sound across the movie theater, is most apposite in reference to noise and its capacity to surface from any region of the cinematic soundscape.

Indeed, if audience noise caused concern within industry discourse, production and projection received even greater emphasis. In 1929, Columbia Pictures President Harry Cohn notes, “I look for the perfection of a camera that will do away with the necessity of sound-proofed camera booths. The removal of the present noises that accompany the amplification of sound in projection.”²³ The most pronounced effort to curb projection noises was via the elimination of “ground noise,” or “Any noise due to foreign matter or imperfections in or on the film arising during manufacture, processing, or handling; does not include amplifier or photoelectric cell noises.”²⁴ Ground noise epitomizes the physical materiality of film sound. Debates over how to eliminate this were enacted in the pages of *JSMPE* and *The Film Daily* from 1927 through 1932, by which point solutions began to emerge. In a *JSMPE* article from 1930, Porter H. Evans explains the challenges associated with curbing ground noise:

Film that is handled in the average way in the theater gets dirt and grease on it. This raises the ground noise. If it is handled carelessly in the projector or run through projectors that are out of repair, the film tears at the sprocket holes. If these tears extend into the sound track the tear produces noise. Film life is apparently tolerated by the amount of ground noise tolerated.²⁵

Multiple solutions developed. One from the late 1920s involved high modulation of tone values. A lacquer was also developed that could eliminate noises when applied to the film strip.²⁶ The most enduring solution was a commercial shutter that could deflect light away from the strip of film.

Other adjectives for noise were more or less interchangeable. These included foreign noise, extraneous noise, outside noise, surface noise, and external noise. Each refers to the interference of unwanted noises. Where ground noise arose from the projection booth and the circulation of film prints, other forms arose from the studio. In an attempt to remedy this, during the late 1920s and early 1930s, studios soundproofed themselves from ambient noise. A *JSMPE* article from 1929 notes of the “sound studio” as “A motion picture studio designed with a special wall, floor, and ceiling covering to limit reverberations, exclude foreign noises, and give the proper effect to any sounds produced in the studio for recording.”²⁷ This usage is synonymous with extraneous noise and outside noise, and an article from 1928 states that “Freedom from outside noises is more a matter of attention to numerous details of construction than of building magic sound proof walls. That term ‘sound proof wall’ like the term ‘projectile proof armor’ is a purely relative one.”²⁸ Outside noise also referred to sounds from outside the studio that might impede acoustical clarity during shooting; this led studios to shoot at night with greater frequency.²⁹ “External noise” carried a similar connotation; a *JSMPE* article from March of 1931 notes the importance of a studio design capable of eliminating ambient sound:

The sound studio is a large building into which no daylight or sound penetrates; in short, it is a place completely isolated from the outer world. The walls of the studio must meet two conditions: they must prevent the passage of external noise, and they must, inside, partially absorb the sound waves which fall on them in order to avoid excessive reverberation.³⁰

Clothing and props could also cause unwanted sounds in the studio. A comical article from January of 1929 noted that “foreign noise” emanated from an actor’s false teeth.³¹ An article from May of that year noted the importance of costumes with soft materials, in contrast with “metallic cloth that rustles and makes a noise when the actress walks across the stage.”³² These sounds necessitated hiring an individual to sit in a sound proof room and listen to the microphones employed during shooting.³³ This position reflected how acoustic specialists were fluent in what Jonathan Sterne refers to as the “audile techniques” infiltrating the motion picture industry.³⁴

It is in this desperate context to eliminate noise from film production that developments such as noiseless recording were hailed as great triumphs within the industry. The invention of noiseless recording by Western Electric and Fox occurred in December of 1930 made dialogue clearer. Acoustic contingency became concentrated even more exclusively in the auditorium, heightening the contrast between the aural purity of the screen and the potentially noisy environment of the movie theater. Nevertheless, instances existed in which noise was implemented and theorized as an active component of the diegesis, discussed in the following two sections.

Noise Onscreen

Mentions of noise within the diegesis occur most often around 1930, after the general institutionalization of sound cinema. In an article explaining the utility of dubbing, for example, noise is mentioned: "For adding sound effects from sound tracks, where it would be difficult or impossible to use direct pick-up of the sounds—such as real street noises, train noises, applause, etc."³⁵ A review of *Bridal Night* (1930) speaks approvingly of the implementation of noises; "Then comes the ghost business, with the old stuff of door-slaming, eerie noises, entanglements used in covering furniture, etc. It gets across pretty well."³⁶ Here noise is not pejorative, but still reduced to a sound effect.

Yet if noise could operate as sound effect, the terms were rarely used interchangeably. Indeed, if noise is commonly juxtaposed against music (following Jacques Attali's dichotomy), trade discourse suggests an opposition between noise and any variation of sound operating in the service of the textual system. Noise connoted unwitting emanation and disruption, while sound effects operated in the service of narrative. Even in the newsreel, noise is not often mentioned in regard to action onscreen. The newsreel of Charles Lindbergh crossing the Atlantic on May 20-21, 1927 offers an example. Reviews for the *New York Times* and *New York Morning Telegraph* resist pejoratively referring to noise, as seen in the *Times* article:

The second evening performance at Roxy's Theatre [in New York City] last night evoked a demonstration during the showing of pictures of Lindbergh. By a recording device, the roar of Lindbergh's plane was heard as pictures of the ship leaving the ground were shown. The film and sound of the motor, together with the cheers of watchers in Roosevelt Field observing the plane ascend made a powerful pull on the imagination of the audience, and more than 6,000 persons arose and cheered, drowning out the noise of the recording machine.³⁷

Here the reviewer exuberantly describes watching the sounds of the plane, yet resists invoking "noise" in relation to the activity. Instead, "noise" is reserved for the unwanted sound of the recording equipment. This example illustrates the firm line drawn in trade journals between action on the screen and sounds of the movie hall, with the latter subordinated to the point of sustaining an entire industry discourse devoted to its erasure.

There were also rare examples of noise serving as attraction. A review of *Noah's Ark* (1929), for example, valorizes the film's "noise" as its primary attraction:

Throughout the picture the producers have made it a point to arrest and to shock their audiences by sheer impact of movement and noise. And in this they have not failed...As a plot it is slow moving and tedious, and more often than otherwise its players act too freely and become genuine too seldom. However, it is the effect of visual and audible impressions which the Warners have sought. This they have found, and I wish them the unqualified success they deserve.³⁸

Here noise plays a leading role in recuperating the movie; instead of what Michel Chion designates as "causal listening," noise is appreciated as its own attraction.³⁹ An *American Cinematographer* article from 1928 was even more effusive, predicting, "The screen drama of the immediate future will involve not conflicting character, but competitive noise."⁴⁰ In this formulation, embracing noise would not even involve listening against the grain. Aesthetic appreciation for noise as a textual component, however, still involved the elimination of noise in its spatial connotation, as ambient noise threatened the legibility of textual noise. These examples of textual noise are not complete outliers, but as the 1930s arrived and sound structured itself more centrally around dialogue, appreciations of noise resided mainly in film promotion.

Noise and Film Promotion

In addition to acting as a component of the physical terrain of the movie theater and the diegesis, noise assumed a promotional function. Theater owners lured prospective customers by making noise; within the industry, this was known as a ballyhoo. An article in *Motion Picture News* from October of 1930 explains that a ballyhoo is a form of exploitation, albeit one in which standards of etiquette stipulate that the exploitation not misrepresent the picture it was designed to promote:

And what constitutes exploitation? There's so many ways of exploitation that it is rather hard to state just what does constitute exploitation. I would refer to any form of a street device for selling a picture as a street ballyhoo. I would refer to any noise or music device for selling a picture as a ballyhoo, which shows that even the present day theatre manager does have to use bally methods in selling some of his shows, but his ballyhoo must carry a truthful message. And it must be stated that some of the old time showmen who stood on the platform yelling their wares to the public were apt to stress a point here and there, such as the giant

reptile you will see on the inside, captured after it had strangled 40 men to death with one stroke.⁴¹

This instance of film promotion gestures at the persistence of film's presentational era of address. Miriam Hansen articulates cinema's presentational mode in her interpretation of D.W. Griffith, whose *Intolerance* she reads as itself operating on the interstices of presentation and standardization, harkening back to film's emergence from the working-class traditions of the magic lantern and stage lecturer.⁴² The carnivalesque character of these traditions evinces a different attitude toward noise than the rational perspective discussed earlier. The author seems aware that his tactics might be construed as belonging to cinema's past even though noise still draws people into the theater.

The ballyhoo appears to have been more prevalent in rural, as well as Southern, theaters less invested in noise elimination. In the "Exploit-O-Grams" column in *The Film Daily* (a similar column appeared in *Motion Picture News*), owners shared ideas for drawing crowds, many of which involved noisemaking. This column, which began before synchronized sound but continued well after its inauguration, offered "Brief outlines of practical exploitation stunts. They give all necessary information the exhibitor needs to put them over. They have made money for others. They will make money for you." For example, a theater in Nashville used a large model train to attract customers: "Ballyhooed with a small locomotive, an exact replica on automobile wheels of a huge railroad engine. The bell was real enough as it was borrowed from a railroad and it made enough noise to attract attention for blocks around."⁴³ A theater from Mansfield was even noisier:

Had 40 piece school band on stage made up entirely of girls. Gave all the girls paper hats and the boys noise makers. They rooted and carried on the same as if they were at the game. I let them make all the noise they wanted...I doubt if any director of presentations could have given the picture a more natural setting.⁴⁴

Here noise assumes none of the educational value. Instead, noise is formulated in terms that accord with James Lastra's description of sound during the silent era:

Pre-talkie sound was, it is clear, a multiple and heterogeneous set of phenomena comprising a wide of variety of functions. From "barking" to hailing, within and outside the text, sound emphasized its presence and its necessity by organizing and reorganizing the cultural practice of cinema as a kind of performance, whether through the elaborate practices of synchronous sound accompaniment, lecturing, or musical presentations of various kinds.⁴⁵

Decorum may have been more stringently enforced once the film began; yet the fact that noise drew patrons into the theater suggests that attitudes toward noise were less restrictive than the initiatives to eliminate it from production and exhibition. These promotional strategies indicate that even with the onset of sound cinema in Hollywood, noise was not entirely repressed, particularly in rural settings.

While references to the ballyhoo speak to varied attitudes toward noise, these instances still failed to challenge the dominant view of noise as an item for removal. The promotional context stands far removed from other connotations for noise, but with no indication that noise carries the kind of expressly political potentiality located by Jacques Attali—indeed, noise operates in the service of theater owners, just as noise elimination served the interest of theater owners. References to noise promotion existed in a small corner of *Motion Picture News* and *Film Daily*, segregated from the primary content of each issue. Noise promotion also did not shape onscreen activity, and one is left hypothesizing as to what might have been, had noise constituted an onscreen attraction. Following references by Douglas Kahn to noise as a modernist trope and Michel Chion's argument for noise as an active component of the cinematic text, a topic for further investigation involves charting references to noise onscreen within more modernist publications, such as *Close-Up*.

Conclusions

This discussion has explored how the discourse surrounding noise during the late 1920s and early 1930s was primarily dominated by an ethos tied to rationality and acoustic clarity. As such, the treatment of noise seems to corroborate arguments by Douglas Gomery⁴⁶—and to a lesser extent, Donald Crafton⁴⁷—that the transition to synchronized sound was rational. Here rationality refers not only to relatively uniform efforts to eliminate noise, but also to the emphasis on quantifiable, "scientific" methods that informed sound engineers' attempts to regulate film sound. The efforts of these acoustic specialists suggest a parallel between the soundscapes addressed by Thompson and Schafer and the soundscape of the movie theater, united through an ethos of noise erasure. Such antipathy toward noise speaks to a paradox: while the onset of synchronized sound ushered in "sound cinema," this also involved eliminating less favorable sounds. At the same time, the persistence of noise as a form of promotion, a practice originating during the silent era, signals that competing paradigms toward noise existed

simultaneously, with the shift in cinematic exhibition from cinema's presentational period to its era of standardization paralleled on the level of noise.

For all the groupthink surrounding film sound between 1926 and 1932, eliminating noise altogether was at best an impossible dream. Anyone who has had to contend with the ancillary sounds of shoes on the floor, whispering among neighbors or the consumption of food can testify to the persistence of noise. Yet, even if noise could never be eliminated, it is worth historicizing for its relevance within the soundscape of the time period, within the social context of decades-long efforts to eliminate it. Its richness as an object of study resides in its varied iterations, not limited to the screen but encompassing cinematic production, circulation, exhibition, and reception. Indeed, we can appreciate the extent to which noise illustrates the acoustic complexity of the cinematic experience.

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Notes

¹ This advertisement refers to six newly-released talkies by Fox. *Film Daily*, January 17, 1929, 19.

² For example, in *The Talkies: Hollywood's Conversion to Sound*, Donald Crafton concentrates on 1926-1932. See Crafton, *The Talkies: Hollywood's Conversion to Sound, 1926-1932* (Berkeley: University of California Press, 1997). Steven Wurtzler also makes this point in describing the influence of mass media apparatuses (including the radio, telephone, and phonograph industries) in facilitating Hollywood's shift to sound. See Wurtzler, *Electric Sounds: Technological Change and the Rise of Corporate Mass Media* (New York: Columbia University Press, 2007).

³ R. Murray Schafer, *The Soundscape: Our Sonic Environment and the Tuning of the World* (Rochester: Destiny Books, 1994).

⁴ Emily Thompson, *The Soundscape of Modernity: Architectural Acoustics and the Culture of Listening in America, 1900-1933* (Cambridge, MA: MIT Press, 2002).

⁵ Jacques Attali, *Noise: The Political Economy of Music*, Trans. Brian Massumi, (Minneapolis: University of Minnesota Press, 1985 [1977]).

⁶ Nora Alter and Lutz Koepnick, "Introduction," *Sound Matters: Essays on the Acoustics of German Culture* (New York: Berghahn Books, 2004), 1-29.

⁷ Douglas Kahn, *Noise, Water, Meat: A History of Sound in the Arts* (Cambridge, MA: MIT Press, 1999), 20.

⁸ Michel Chion, *Audio-Vision*, Ed. and Trans. Claudia Gorbman (New York: Columbia UP, 1994 [1990]), 125.

⁹ Thompson, 1.

¹⁰ *Ibid.*, 117.

¹¹ *Ibid.*, 119.

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- ¹²Thompson, *The Soundscape of Modernity*; John Picker, *Victorian Soundscapes* (New York: Oxford UP, 2003); Karen Bijstervald, "Listening to Machines: Industrial Noise, Hearing Loss and the Cultural Meaning of Sound," *Osiris* 18 (2003): 173-193.
- ¹³ *Ibid.*, 167.
- ¹⁴ Henry Cowell, "The Joys of Noise," *New Republic* 59 (31 July 1929): 287.
- ¹⁵ Crafton, 249.
- ¹⁶ *Film Daily*, Sunday, December 21, 1930, "Obtaining Correct Volume Important Sound Problem," 6.
- ¹⁷ S.K. Wolf, "The Mirror—A Column of Comment," *Film Daily*, November 15, 1929, 5.
- ¹⁸ R.B. McCullough, "Even Loading is Important in Sound House Seating," *Film Daily*, July 5, 1929, 6.
- ¹⁹ Wolf, "The Mirror—A Column of Comment," *Film Daily*, November 15, 1929, 5.
- ²⁰ S.K. Wolf, "Articulation Test for Sound Houses Outlined by Engineer," *Film Daily*, February 2, 1930, 12.
- ²¹ L.T. Robinson, "Some Thoughts About Motion Pictures with Sound," *SMPE* 12, no. 35, 855-866.
- ²² Rick Altman, "Introduction," *Sound Theory, Sound Practice* (New York: Routledge, 1992), 6.
- ²³ *Film Daily*, September 9, 1929, 4.
- ²⁴ "Glossary of Technical Terms Used in the Motion Picture Industry," *Journal of Society of Motion Picture Engineers* 13, no. 37, 1929, 48-64, 53.
- ²⁵ Porter Evans, "A Study of Sound on Disk and Film," *Journal of Society of Motion Picture Engineers*, 185-192, 191.
- ²⁶ "Lacquer for After Patching," *The Film Daily*, December 13, 1931, 6.
- ²⁷ "Glossary of Technical Terms," 61.
- ²⁸ Paul E. Sabine, "The Acoustics of Sound Recording Rooms," *Journal of the Society of Motion Picture Engineers* 12, no. 35, 809-822, 818.
- ²⁹ H.C. Humphrey, "Typical Sound Studio Recording Installations," *Journal of the Society of Motion Picture Engineers*, 13, no. 37, 1929, 158-172, 171.
- ³⁰ P. Bonneau, "The Talking Film," *Journal of the Society of Motion Picture Engineers*, 1931, 399-426, 409.
- ³¹ "Short Shots from New York Studios," *Film Daily*, January 22, 1929, 3.
- ³² "Says Talkers Have Not Ended Elaborate Scenes," *Film Daily*, May 26, 1929, 10.
- ³³ "Recording Controlled by Monitor Men," *Film Daily*, September 1, 1929, 56.
- ³⁴ Jonathan Sterne, *The Audible Past: Cultural Origins of Sound Production*, (Durham: Duke University Press, 2003), 118.
- ³⁵ "Dubbing Sound Pictures Discussed by Geo. Lewin," *Film Daily*, October 17, 1930, 11.
- ³⁶ "Review of *Bridal Night*," *Film Daily*, September 14, 1930, 13.

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- ³⁷ Reprinted as an advertisement in *Film Daily*, May 24, 1927, 8.
- ³⁸ "Newspaper Opinions," *Film Daily*, Wednesday, March 20, 1929, 9.
- ³⁹ Chion, "The Three Listening Modes," *Audio-Vision*, 25-34.
- ⁴⁰ "Talkies from a Writer's Angle," *American Cinematographer*, August 1928, 30. This article is also discussed by James Lastra, *Sound Technology and the American Cinema: Perception, Representation, Modernity* (New York: Columbia UP, 2000).
- ⁴¹ "What is Exploitation?," *Motion Picture News* 42 (October-December 1930), 89.
- ⁴² Miriam Hansen, *Babel and Babylon: Spectatorship in American Silent Film* (Cambridge, MA: Harvard UP, 1991).
- ⁴³ "Exploit-O-Grams," *Film Daily*, January 24, 1927, 4.
- ⁴⁴ "Exploit-O-Grams," *Film Daily*, October 29, 1926, 7.
- ⁴⁵ Lastra, 118.
- ⁴⁶ Douglas Gomery, *The Coming of Sound: A History* (New York: Routledge, 2005).
- ⁴⁷ Crafton, *The Talkies*.