Sound Media

From Live Journalism to Music Recording

Lars Nyre

Sound Media

Everyday life is full of soundscapes created by professionals. *Sound Media* considers how music recording, radio broadcasting and muzak influence people's daily lives and introduces the many and varied creative techniques that have developed in music and journalism throughout the twentieth century. Lars Nyre presents the contemporary cultural engagements in the field of sound studies, and works back from the soundscapes of the present day to the 1870s.

The first part of the book, 'The present time', devotes five chapters to contemporary digital media, with particular focus on the internet, the personal computer, digital radio (news and talk) and various types of loudspeaker media (muzak, DJ'ing, clubbing and PA systems).

In the second part, 'Backwards history', Lars Nyre examines the historical accumulation of techniques and sounds in sound media. The history is told backwards, to peel off layers of technologies and practices, with a particular focus on multitrack music in the 1960s, the golden age of radio in the 1950s and back to the 1930s, microphone recording of music in the 1930s, and the experimental phase of wireless radio in the 1910s and 1900s, concluding with the invention of the gramophone and phonograph in the late nineteenth century.

Sound Media is a book for media students and scholars, music lovers and media pundits, as well as journalists, musicians and audio engineers. It includes a soundtrack CD with thirty-six examples from broadcasting and music recording in Europe and the USA, from Edith Piaf to Sara Cox, and is richly illustrated with figures, timelines and technical drawings.

Lars Nyre is an Associate Professor at the University of Bergen and Volda University College, Norway. He is chair of the research network Digital Radio Cultures in Europe (www.drace.org) and has published articles about mass media in research journals including *Journalism Studies* and the *Journal of Radio and Audio Media*.

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Additional resources were previously made available for this title on CD. However, as CD has become a less accessible format, all resources have been moved to a more convenient online download option.

You can find these resources available here: http://resourcecentre.routledge.com/books/9780415391146

Please note: Where this title mentions the associated disc, please use the downloadable resources instead.

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Note

Atle Skorstad created all the artwork, including the tableaus and the sketches of audio equipment and distribution platforms. Lars Nyre created the timelines and constructed the medium models based on Skorstad's sketches. Kjetil Vikene supplied the screen shot of haltKarl's composition for chapter 3. The map of New York City in chapter 4 is reprinted with the kind permission of Johomaps.

Soundtrack

This book enquires about techniques of communication in sound, and this is exactly what the soundtrack demonstrates. It is a chain of sounds including pop, rock and classical music, montages, machine sounds, live news, documentary, quiz shows and studio entertainment. You can listen to the soundtrack without reading the book, but you cannot read the book without listening to the soundtrack. If the soundtrack does not support the claims made in the case studies the critical reader/listener will be the first to know.

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Duration: 54:00. All tracks compiled by Lars Nyre. Copyright clearance administered by Sigmund Elias Holm. Sound engineering and mixing by Reidulf Botn. Executive producer: Sverre Liestøl. CD design: Thomas Lewe. Published by Routledge 2008. More details can be found in the soundtrack supplement at the end of the book.

Acknowledgements

If you got ears, you gotta listen.

(Captain Beefheart, 1980)

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The works of the phenomenologist and technology philosopher Don Ihde have inspired me since I first picked up *Listening and Voice* in the mid-1990s. In 2000 I was a visiting scholar and regular attendant at the Technoscience Research Seminar on Long Island, New York. Here I learnt to appreciate the links between American philosophy of technology and media studies, and this helped me to vindicate Marshall McLuhan as a serious scholar of the media.

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Lars Nyre
Bergen, June 2008

Chapter 1

Theoretical introduction to sound media

What you hold in your hands is a book, and consequently you are now immersed in its sensory environment. Your eyes follow the argument line by line and page by page; you can skip between chapters at your leisure; and once in a while you may find yourself thinking new thoughts. Reading and writing are efficient techniques of communication, and they have been fostered around the book (and scroll and clay tablet) for thousands of years. The experience of sound media is entirely different from the experience of the book. You tap your foot half-consciously to the funky beat of the music, and you imaginatively share the adventures of the foreign correspondent on radio while doing the housekeeping.

This book is all about sound media, and this chapter clears the ground for an analysis of altogether ten different set-ups of the sound media that are widespread at the present time, or were influential earlier in history. The book is organized according to my version of the research tradition called medium theory. Joshua Meyrowitz has given a lucid definition of medium theory that I will start from:

> Medium theory focuses on the particular characteristics of each individual medium or of each particular type of media. Broadly speaking, medium theorists ask: What are the relatively fixed features of each means of communicating and how do these features make the medium physically, psychologically, and socially different from other media and from face to face interaction?
>
> (Meyrowitz 1994: 50)

By my lights Meyrowitz sets up a reasonable ambition for the media researcher, and indeed dozens of prominent researchers have studied more or less exactly what he prescribes without actively thinking about themselves as medium theorists (for example, Ellis 2000 and Scannell 1996). Briefly stated, my version of medium theory has four dimensions: 1) a description of sound and listening; 2) a theory of what a medium is; 3) a method for a backwards history of media; and 4) a method for rhetorical analysis of journalism and music.

1 SOUND AND LISTENING

The *Concise Oxford Dictionary* (1975) defines sound as an experience of the ear caused by vibrations in the surrounding air; an event that is being or may be heard; the act of giving forth sound or causing to sound. But you don't need a dictionary to know what sound is. Your body hears long before you can read a dictionary, since from the first day of your life you have navigated through the world with the aid of the sense of hearing. You don't have earlids like you have eyelids, and even the deaf can feel sonic vibrations in their bodies. Hunters in the jungles of New Guinea relate to bird song, insect noises, and trees and plants moving in the wind. City dwellers relate to sounds of transportation, large masses of people, ventilation systems and fire engine sirens. R. Murray Schafer ([1977]1994: 274) coined the term 'soundscape' to capture this never-ending presence of sound in people's everyday lives.

Natural sound

Natural sound is my term for all the sounds that are non-mediated – that is, they occurred before sound media were invented, or they occur without any form of transmission or recording at the present time. Natural sound is crucial to public life in all civilizations of the world, especially in the form of oratory and song. Imagine Enrico Caruso (1873–1921) performing in San Francisco in April 1906, on the night before the great earthquake. The concert hall is packed with well-to-do citizens in starched shirts and gowns, their senses trained on the operatic singer and the orchestra. With eager expectation they hear sound waves emanating from Caruso's mouth at 340 metres per second. The sounds inform us about certain features of the actions of Caruso and the orchestra that the other senses do not, but at the same time the other senses give access to visible, touchable and odorous aspects of the same events.

My approach takes the sensory richness of communication into account. It is concerned not just with the sounds in isolation, but also with the things that vibrate – the singers and speakers and their equipment and the wider surroundings. Think of Caruso's body, which is the entire basis of his expressive voice, and imagine his beautiful clothes, his jewellery and the other accessories. These other things also have a communicative influence. Indeed, all five senses must be thought of as one exploratory entity, and in pursuing this thought I am inspired by Merleau-Ponty ([1945] 1992), Gibson (1966) and Ihde ([1976] 2007). On the basis of these influential works, I identify four existential characteristics of sound that guide the individual's communication effort, and these characteristics are also integral to the visible and touchable materials of communication:

- *time* (duration, chronology, causes and effects)
- *space* (directions, shapes, volumes, distances)

Figure 1.1 Caruso in the concert hall.

- *personal expressiveness* (emotions, moods)
- *coded message* (for example, news and love song).

Firstly, sounds always tell us something about time. A performance always happens right now, in front of those present, and for Caruso this means he is under social pressure to perform well. It is the same thing in the theatre, the opera and vaudeville. The real-time progression of sound events causes such phenomena as the nervousness of live performance, whether in the concert hall or at the political rally, where the performers have only one chance of making an impression, and nobody will forget it if they make a fool of themselves because they were ill-prepared. Sound events are ephemeral; they last for only a second, and at most around fifteen seconds in the extreme reverberation of a mountain pass. When the energy is expended a particular sound is gone forever. Some sound events appear to last for a long time, for example the constant roar of a waterfall or a tedious political speech that goes on for hours, but these consist of a continuous generation of sounds that all wear off immediately and are never heard again.

Before the invention of recording all the sound events were by definition continuous with the progression of the world at large. Caruso represented a

new era with his famous recordings, which he released from the early 1900s (Day 2000). Many San Franciscans had listened to his records the night before the opera; over and over again they had listened to his tenor voice rising and falling, and the experience must have heightened their expectations. Tonight I will hear and see him in the flesh! And this is partly why Caruso is nervous. Unlike the recording session, a concert has no second take. Reviewers from San Francisco newspapers would be listening carefully and publish their reviews the next morning.

Secondly, sounds always tell us something about space. Caruso is singing in a modern concert hall, which is sound-proofed, with a rich and precise resonance created by expert acousticians. A concert hall is a sound technology, but it is not a mediation technology. It can be compared with the ancient amphitheatre and arenas in Greek and Roman times, except that the biggest arenas did not have a roof and had less well-controlled acoustics. Over 50,000 people could be in attendance at a Roman arena, and the sounds from the stage could reach even the cheapest seats with a measure of clarity, at least when the audience was silent. In a telling phrase Theo van Leeuwen (1999: 14) calls sound a 'wrap-around medium'. Referring to the same experience, Rick Altman calls sound a 'three-dimensional materiality'. He beautifully describes a woman speaking in an auditorium: 'Radiating out like a cone from the actress's mouth, the sound pressure soon fills up the entire auditorium, bouncing off the walls, the floor, and the ceiling, and bending around audience members, chairs, and posts until it is finally completely absorbed' (Altman 1992a: 21). Sound is never located at a singular geometrical point; it is always in the process of spreading further into the surroundings, and therefore the environment resounds with events from above or below, far away and too near, all the time. The bang of a closing door goes through the walls and resonates up the stairs, for an instant filling the corridor or even the street with its impatient movement. Great waterfalls can be heard miles away. In more technical terms the resonance in a given surrounding is related to the volume of the sounds (the louder, the greater the area of coverage), their frequency characteristics (low frequencies spread out in all directions, high frequencies go in a precise direction), and the texture of the things involved in the movement (waves are absorbed by soft materials and bounce off hard materials).

The environmental function of sound is important because humans live with it all their lives, perhaps coping well but perhaps also being stressed by it. Schafer ([1977] 1994) vividly describes the low fidelity sound of the modern West, where mechanical and electrical noises of all kinds make sure that there is never a moment of real silence. He perceptively points out that in such an environment sound does not come towards the listener but is present everywhere. Tony Schwartz (1974: 48) argues that 'acoustic space is more like something we wear or sit in than a physical area in which we move. A listener is wrapped in auditory space and reverberates with the sound.' To clarify the concept of environment I will set up a contrast between the general environment

and the ambient environment. The general environment really consists of an average, and takes into account all the auditory experiences that a person could have while moving around in a given city or country, while the *ambient environment* refers to the actual sounds and other sense impressions that individuals have in their everyday locations, where they go about their lives as usual. This book focuses on the individual experiences of the sound environment, but it must be said that it is quite impossible to make empirical descriptions of them (I do not have access to their perception), and therefore it is nevertheless a general description of individual experiences.

Directional hearing developed as an early-warning system for physical danger – for animals just as much as for humans. Hearing surveys the soundscape and helps us to direct our eyes to a particular source of sound. This is simply human awareness, the ability to react quickly to new information (see Plomp 2002; Handel 1989). Wandering around in the soundscape of their city or village, people can easily discern the difference between locations based on sound. Sounds are the raw material for the orientations and explorations in which human beings constantly engage. In San Francisco in 1906 it started with a low rumbling that was different from all the familiar sounds of the city; it was soon accompanied by all kinds of things falling down, and the creaking and whining of wood, concrete and metal being dislocated, things crashing down on them. Finding yourself in an earthquake in the middle of a big modern city awakens your survival instincts. This is perception at its most acute.

Thirdly, sounds always tell us something about the personality of the performers. Simon Frith (1998: 191) claims that the singing voice 'stands for the person more directly than any other musical device'. Song and speech sounds spread out from the mouth, with the hands and body often helping the words to achieve their intended meaning. When Caruso sang 'The Siciliana', a complex ensemble of tongue, jaw, teeth, lips, nasal cavity, larynx and breath were involved, all trained to perfection by the great tenor. Beyond the talented timbres of 'The Siciliana' is the person Enrico Caruso. How did he interpret the intended passions of the song? Did he sound vulnerable or aggressive; and were any of his emotions particularly authentic because of a desperate love affair in his own life? The personal and private resonance of communication became very important with the emergence of sound media, and its historical development is at the heart of this book.

Finally, sounds often tell us something about the world by carrying a coded message. After all, the main reason why humans carry on vocalizing and melodizing is that these sounds can communicate messages to other humans very efficiently. There is no end to the uses to whcih language and melody can be put, and the resulting communication varies with, for example, the mother tongue used (Italian versus Norwegian), the social setting (formal or informal) and the speaker's skills (eloquent or clumsy). Let me stick to my case, and inform you that during the fateful night in San Francisco Caruso sang an aria from the opera *Cavalleria rusticana* (1890) by Pietro Mascagni. As the opera begins a

young villager sings 'The Siciliana (O Lola, lovely as the spring's bright blooms)', a tormented love song to a young maiden. The villager has returned from military service and found that while he was gone Lola abandoned him and married the prosperous village teamster. This act of treason is sweetened by the fact that she is still in love with the young man. From this starting point the love story evolves. Please imagine the rich cultural analysis that could be made of Caruso's performance by combining operatic history with Italian cultural history and the great immigration surge to the USA during the early 1900s. Although the larger cultural context of these messages is not pursued actively in my book, it is all the time a background feature.

Mediated sound

Since the 1870s the messages in sound have been not only a natural but also a mediated phenomenon. Strange things are accomplished through recording, telephony and broadcasting. These media separate sounds from their occurrence in one place only and allow them to be projected in many unassociated places at the same time, or be repeated indefinitely later on (this has been pointed out by a host of authors, for example Jones 1992; Chanan 1995; Millard 2005; Katz 2004; Lax 2008). In millions of homes people have listened to the music of Caruso on the gramophone, have struggled with the weak transatlantic telephone connection, or have worried at the stern sound of Margaret Thatcher's voice on the radio. The fact that sounds were repeated outside the time and place of the original performance caused confusion in private and public life. In a typically modern way both producers and listeners have explored all conceivable opportunities to communicate with each other, slowly creating new provinces of meaning in sound communication (Bull and Black 2003).

I will analyse in this book a series of mediated sounds quite closely all of which are contained on the accompanying soundtrack CD. The first track is symbolic of the theoretical tradition from which I write. The LP is called *The Medium is the Massage* and was released by Columbia Records in 1967 as an accompaniment to the book of the same title (McLuhan and Fiore 1967). These sounds could only be made with modern, professional stereo tape equipment (8 or 12 track). The production is typical of the media environment in New York City in 1968, in the midst of psychedelia, the Vietnam War and the 1960s cultural revolutions. The book version of *The Medium is the Massage* is, by the way, a beautiful example of creative typography, and the pages are filled with unusually large and small type faces, drawings, photographs and facsimiles that support the argument of the volume.

My intention in analysing the McLuhan LP is to clarify the difference between the properties of mediated such as and the properties of natural sound such as Caruso singing in the concert hall in 1906. In order to be systematic, I will present the McLuhan track according to the same four characteristics as

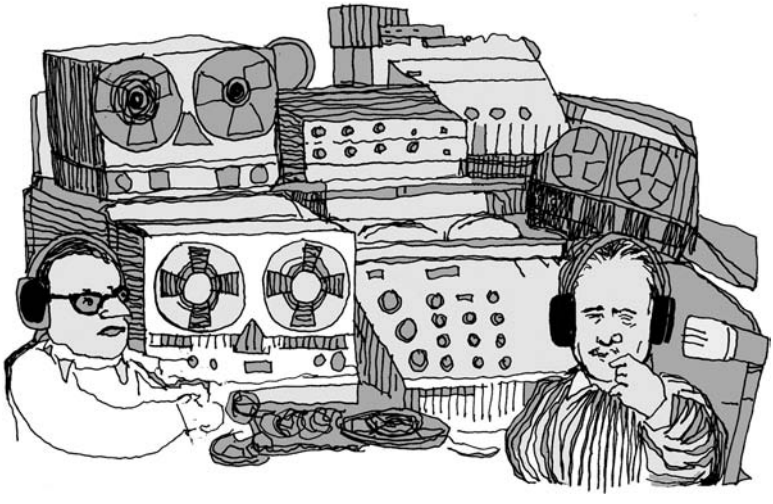

Figure 1.2 McLuhan in the control room.

before: time, space, personality and message. McLuhan's aphorisms are transcribed for legibility, but most of the sounds are completely untranscribable.

Track 1: Marshall McLuhan: The Medium is the Massage, 1967 (1:42).

> – Until writing was invented, man lived in acoustic space, boundless, directionless, horizonless, in the dark of the mind, in the world of emotion, by primordial intuition, by terror. Speech is a social chart of this bond.
> – The medium of our time, electric circuitry, profoundly involves men with each other. Information [verbal loops and effects throughout].
> – There are no grammatical errors in a non-literate society.
> – All media work us over completely. They are so pervasive in their personal, political, economic, aesthetic, psychological, moral, ethical and social consequences that they leave no part of us untouched, unaffected, unaltered. The medium is the massage.
> – Any understanding of social and cultural change is impossible without the knowledge about how media work as environments.
> – Everything we do is music.

Firstly, the temporal existence of recorded sound is quite different from that of natural sound. Recorded sound is a material object fixed in time that can be bought and sold on the market. A recording has no continuity with the world, and that is why we can hear McLuhan and his companions today, even

though they spoke in 1967. People can record important events such as the birth of their first child for the family history archive, and in doing so they bring the event into the future as something that can be experienced again and again.

Secondly, the acoustic space of a recording is in a sense double (Altman 1992a: 27). The sounds from the loudspeaker have their own acoustic space that is safely contained on the recording. The weird electronic noises that McLuhan and company made in 1967 can be played back in a number of different acoustic settings, and when they fill the listeners' room they are affected by the characteristics of that room. Since the technically produced acoustic space fills up a domestic space, the result is a double space. Notice that the acoustic space of the recording is unchangeable, except that the listeners can adjust the volume and place the loudspeakers in different ways to influence it slightly. If you move closer to the loudspeaker the sound gets louder, but you don't move closer to McLuhan. And there is obviously no way of entering that recorded space and moving around in it. Furthermore, the acoustic space of mediated sound is transportable. It can be played back in all kinds of public and private places. People can play the sound on their private stereo system, and this allows them to share the experience with friends. Since the Walkman was introduced in the early 1980s people have been able to take the mediated acoustic space with them wherever they go. If they like, they can be completely immersed in their own private experience.

Thirdly, personality in sound media is quite an elusive matter. Clearly, there is no direct contact between speakers and listeners as there could have been between Caruso and his fans. The performances are already complete when people hear them. Listeners cannot interact with McLuhan in a reciprocal way. There is, for example, no way to ask him what the heck he is trying to tell us. This means that in recording and broadcasting the relationship between producers and listeners is asymmetrical. The producers are absent from the listeners' locale, and the listeners are absent from the producer's locale. Never the twain shall meet. But despite the division there is obviously a process of contact between them, since mass communication works fine across the years and over large distances. There is an industrial distribution of messages to a dispersed public instead of a dialogue between interlocutors (Scannell 2005: 130). Anthony Giddens argues that the mass-produced address requires a specific form of trust. Since media events are substantially absent from the listener's perspective, people are forced to trust the persons who make the claims in quite an open and risky way: 'Trust presumes a leap to commitment, a quality of "faith" that is irreducible.' It is specifically related to the account of events from which people were absent in time and space, Giddens stresses (1991: 19). An implication of Giddens's argument is that there is little need for trust in events that are constantly in view, and which can be directly monitored and intervened in if necessary. Consequently, there is a great need for trust in the mass media.

2 MEDIUM THEORY

As already stated, I subscribe to a long tradition of scholarship that is often called medium theory, and it comes as no surprise that Marshall McLuhan is a crucial influence on my work. There is a large literature of interpretations of McLuhan's work; see, for example, Miller (1971), Grosswiler (1998), Genosko (1999), Levinson (1999) and Moss and Morra (2004).

There is one sentence on the McLuhan LP that is very helpful in pointing out what medium theory is about: 'Any understanding of social and cultural change is impossible without the knowledge about how media work as environments.' I take McLuhan's proposition to be profoundly true. The media are environments on a level with railways, road systems, airports and other gigantic technological infrastructures in society, although they are indeed many other things also. It is worth sticking with the material dimension, as McLuhan does when he argues that 'technological media are staples or natural resources, exactly as are coal and cotton and oil' ([1964] 1994: 21). The humans have set about refining their natural environment with electronic technologies, and are planning to live with these arrangements for a really long time. McLuhan describes what happens during such a long exposure to a technology: 'Physiologically, man in the normal use of technology (or his variously extended body) is perpetually modified by it and in turn finds ever new ways of modifying his technology' (ibid. 46). His theory acknowledges that this is a flexible relationship, but he nevertheless stresses that man is not completely in control of his technologies. He argues that 'technological environments are not merely passive containers of people but are active processes that reshape people and other technologies alike' (McLuhan [1962] 1992: i). For example, there are environmental aspects to flying across the Atlantic, and they will affect all passengers more or less equally in the long run, but the passengers are probably more concerned with the short-term effect of getting home quickly. I find it fruitful to apply this environmental theory of change on the mass media.

A medium cannot work as an environment without lots of people using the same equipment and practising the same techniques for a long time. A technology that has just left the laboratory cannot be said to work as an environment. The concept of media environment presumes industrial production of equipment in many countries and millions of people who have become accustomed to using it over a long time, perhaps during their entire life. And, most importantly, the concept of a media environment presumes that the medium quite regularly appears as a social background in people's everyday engagements.

Materiality up front

Notice how strongly my theoretical approach stresses the material dimension of the media (this perspective is inspired by Innis [1951] 1991; Winner 1986;

Ihde 1990; Gumbrecht and Pfeiffer 1994 and Mitcham 1994, among others). The media are results of scientific research under Western capitalism, and its combination of high-tech precision and desperate competition has produced great things. Most types of media equipment were first painstakingly engineered as prototypes in the secret laboratories of large corporations. The historical development of the equipment has had a direct relevance for the social history of the mass media. Many factors propel the industrial production of equipment and make sure that society becomes ever more saturated by the media. There is a regular replacement of equipment in private homes and company offices whenever a new and more efficient version has been launched on the market. Electronic stores such as PC World and Dixons are full of new equipment that promises to give the buyer improved efficiency and greater pleasure within a given context of use. In attics and museums discarded equipment piles up, for example cassette decks from the 1970s and 1980s. The wind-up gramophone has been discarded so completely that in 2008 you can really only listen to one if you go to a museum. In addition to the regular replacement of equipment there is an increase in the number of technological platforms that are used at the same time.

Not only do we regularly throw away old versions of the equipment and buy improved versions, we also possess more and more different types of equipment. This process propels the mass production of equipment and innovation in technology. When a new medium is introduced, it never really replaces an old medium but begins to exist alongside the old ones, partly replacing some functions and partly introducing completely new ones (Briggs and Burke 2002: 5). Consider that, during the period from the early 1970s until now, at least two major new technical configurations for communication have been erected: the personal computer, with broadband internet as an important feature, and mobile phone networks with text messaging of many kinds. Lab engineers have developed an endless amount of appliances and plug-ins that go along with them. Consider that before 1970 there were many mature media configurations, for example multitrack stereo music, colour television, 3D movies and voicemail for the telephone.

McLuhan postulated that the materiality of a medium has long-term effects on perception, while the content in the traditional sense is of minor importance. A medium's core characteristic is that it changes the ratio of the senses in public communication, compared to the ratio typical of previous media. After becoming prominent the medium promotes and cultivates some perceptual activities more than others, and in this indirect way it causes social change. McLuhan boldly formulates a law about the relationship between technology and communication:

> For the 'message' of any medium or technology is the change of scale or pace or pattern that it introduces into human affairs. The railway did not introduce movement or transportation or wheel or road into human

> society, but it accelerated and enlarged the scale of previous human functions, creating totally new kinds of cities and new kinds of work and leisure.
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> (McLuhan [1964] 1994: 8)

This statement should not be rejected too hastily. Despite its deterministic ring it is a fruitful starting point for investigations of the changing relationship between humans and media. With refinements McLuhan's proposal to investigate the change of scale or pace or pattern can become a useful tool for analysing media history, as I hope to show in the empirical chapters of this book (and as I have also tried to show in Nyre 2003).

The notion of an influence from the medium *itself* has caused strong theoretical resistance towards medium theory. It seems to clash head-on with a more widespread way of theorizing the role of technologies in the media, namely the position that is often called social constructivism (see, for example, Tuchman 1978; Douglas 1987; Metz 1985; Marvin 1988; Winston 1998; and Lastra 2000). These approaches postulate social needs and aspirations as the driving force of historical development in the media. If such positions are incommensurate with mine it is not because of disputes about the historical facts, but because they do not give the material features of these historical facts sufficient attention. Carolyn Marvin has made a claim about the history of the media that I will label 'social constructivist':

> Media are not fixed natural objects; they have no natural edges. They are constructed complexes of habits, beliefs, and procedures embedded in elaborate cultural codes of communication. The history of media is never more or less than the history of their uses, which always leads us away from them to the social practices and conflicts they illuminate.
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> (Marvin 1988: 8)

From my perspective it is hard to agree with this way of thinking. Consider the sound of Neil Armstrong's statement 'A small step for man, a giant leap for mankind', in July 1969. It was uttered in a helmet in outer space and transported back to earth at the speed of light, and then it was heard live by almost a billion people all over planet earth. The Apollo 11 broadcast goes to show that the mass media certainly have natural edges. The many technologies that made it possible for Armstrong to be heard conform to the laws of gravity, they run on electricity, they take advantage of electromagnetic radiation, and they put sensual constraints on users. It seems that the history of the mass media may just as well lead us towards these natural edges as away from them.

This book argues that a historically new form of social communication came about with microphones and loudspeakers from the late nineteenth century. There were no credible precursors to the experiences created in and around these media; there were only weak approximations such as the mechanical piano