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Noisy Behaviors on the Line

This chapter focuses on noise as an early category of deviant media. It digs deeper and shows how noise is a media category that has been at the center of knowledge production conflicts, negotiations, and power struggles. In this way, I show that there is nothing inherently 'noisy' about noise; it is a flexible and mutable category that changes according to the way it is produced by media companies. By exposing the politics behind differentiating noise from sound, the following pages show how significant this category is in our everyday lives. Importantly, the chapter shows why some actors wanted to shape our understanding of noise.

As I argue in the introduction to this book, this historical account is important in understanding how the category of deviant media changes from noise to spam. What does not change is the interest of media companies to shape and influence people's engagement with media. In this way, what this chapter amplifies is how noise is part of a larger project, enacting power to influence how we engage and understand media.

In the early 20th century, Bell Telephone was a much bigger media company than Facebook or Google are today. The company managed to hold its power for nearly a century, and in this chapter we follow Bell Telephone through its earlier days, as it established and maintained its power. As the company was so influential, it managed to attract the finest minds of the time. One of them was

Claude E. Shannon, who is now known as the father of digital communication. Shannon, who had a mathematical and electronic engineering background, worked at Bell Laboratories in the 1940s. In 1948 he presented one of the first well-known (mathematical) communication models, also known as Information Theory. In 1948 Shannon published in the *Bell System Technical Journal* an article which revolutionized understanding and theorization of communication (and information). This model presented a linearly directed progress from the source who sent a message through a transmitter, which then sent a signal to a receiver and then to the destination. Information theory is considered to be the foundation of much of contemporary understanding and the functioning of computers and digital communication because it introduced the *bit* as a new communication unit.

Shannon's article also showed a diagram of communication, which illustrated how noise was an integral part of the communication channel. Shannon defines noise as "statistical and unpredictable perturbations" (Shannon, 1949: 11). However, the only people who could conduct the measurement and analysis of such statistics and decide when a certain sound will be considered as noise were Bell Telephone technicians. In this way, Bell Telephone (Bell) held a crucial position in conceptualizing and defining noise; they were the **new experts** with the authority to make noise a category. Although information theory is thought to be inspired exclusively by engineers, this chapter will trace other sources of inspiration. In what follows I examine the events that preceded information theory to understand the evolution of the concept of noise. This is not to argue for causal effects of these two events, but rather to create the histories of the subjects, as Foucault argues (1982: 777), or in this case, the mediated subject.

Measurement is key to making a distinction between sound and noise. Presenting itself as a specialist in measuring sound, Bell positioned itself as the obvious choice—the media company received a **license**, an authority to make legitimate knowledge claims about noise. The two events that I explore in this chapter involve measuring different types of things—people and territories. The first event is the Noise Abatement Commission (NAC), which conducted a **measurement** of New York City (NYC), and produced the report *City Noise* in 1930.[1] This Commission collaborated with Bell Laboratories to measure various places in NYC using devices that used quantitative units. The second event focuses on the 1930s and 1940s training programs Bell developed for 'good telephone usage', aimed towards its female telephone operators called *A Design for Living*. Bell measured and analyzed their operators' behavior to train them to become better components of its system.

This chapter will show how Bell established its powerful position by listening to the behaviors of people in NYC and the behaviors of their telephone operators. This listening capacity enabled Bell to know people across NYC and also its female employees inside *and* outside the workspace. Such strategies, then, produced both people and spaces through their measuring tools and units into subjects and territories. While the first event shows how Bell tuned into people and restructured the boundaries of the city architecture; the second event the media company expanded the scope of its listening by reconfiguring the operators' bodies and minds, inside *and* outside the workplace. These programs to **train operators' bodies** were meant to turn the telephone operators into efficient and fast machines, destabilizing the boundaries between humans and non-humans.

These stories show the way Bell, sometimes in collaboration with other interest groups, constantly produced its inventions and services, and along the way, produced new subjects and territories to fit its business model. To do that they needed to remove, **filter**, and eliminate potential disturbances to their business. As these events came two decades before Shannon's Information Theory, they provide alternative historical grounds for the construction of people and territories through sound and noise. This chapter will show how modes of governmentality, specifically discipline and biopolitics, construct the difference between sound and noise. It shows how these governing strategies were used by Bell and the NAC to educate, manage, control, and govern specific groups of people and specific behaviors, as well as re-ordering and re-shaping NYC. In other words, the following chapter will show how noise was developed and used in the early 20th century, and how these developments point to similarities and correlations with how spam is used in the early 21st century.

The Noise Abatement Commission in Early 20th Century New York City

The industrialization of western society in the early 20th century introduced the intrusion of machines into the urban soundscape through factories and transportation, and then penetrated beyond the public space into the private space of people's homes. Along with the change in the texture of the city and the home came noise, which subsequently became a tool used to redraw boundaries of territories and people. Noise as a distinct category was used to represent, manage, and control unwanted sectors of society and unwanted behavior. Demarcating such a distinction was also meant to legitimize people, practices, and areas as the

appropriate 'sound' for a particular territory. To understand how noise was used by Bell, this section focuses on the NAC, formed in 1929, and its involvement with Bell Laboratories (Bell Labs).

On January 1, 1925, the American Telephone and Telegraph (AT&T) and its subsidiary Western Electric (the manufacturing company of all telephone and radio equipment) incorporated to form Bell Telephone Laboratories. For many years, Bell Labs held a monopoly in the creation of media technologies and their corresponding standards. This newly formed company was meant to be more efficient as two engineering departments (AT&T and Western Electric) was a waste of resources. Jon Gertner (2012) in exploring the evolution of Bell Labs argues that, "Bell Labs employees would be investigating anything remotely related to human communications, whether it be conducted through wires or radio or recorded sound or visual images" (2012: 31). Bell Labs not only investigated human communication but also took active part in shaping it and its components, from their own workers and onto the people who used their devices.

The precursor of the NAC was the Society for the Suppression of Unnecessary Noise (SSUN), which was formed in 1906 by Julia Barnett Rice, a physician and wife of the publisher and businessman Isaac Rice. Mrs. Rice had recruited many prominent figures for her campaign and cared dearly about noise. Her first successful step was the Bennet Act of 1907, introduced by New York congressman William Bennet, who designed this federal legislation to regulate unnecessary blowing of whistles in harbours and ports (Thompson, 2004: 121). Although some attention was given to the SSUN, it was only at the end of the 1920s with the stock market crash and increased immigration to the city that Mrs. Rice's efforts bore fruit and reached headlines.

After many complaints from concerned citizens about noise, Mrs. Rice, in collaboration with Dr. Shirley W. Wynne, NYC's Commissioner of Health, founded a special commission in October 1929, to study and measure the city's noise and develop means to abate it. The NAC was the joint venture of many interested parties: the mayor of NYC, James J. Walker; medical specialists of neurology and otology; civil engineers; lawyers; law administrators; acousticians; engineers; automobile representatives; Lewis H. Brown, President of the Johns-Manville Corporation,[2] and the police. Another major actor in the NAC was Dr. Harvey Fletcher the president and founder of the Bell Laboratories research center. Fletcher was also the president of the Acoustic Society of America and a fellow of the Organizations for the Hard of Hearing. The collaboration with Bell Labs might seem strange at first, mainly because many of its inventions were part

of the source of city noise: telephones, radio loud speakers, etc. However, as Emily Thompson (2004) argues:

> Although the papers described the organization as an 'anti-noise' society, Mrs. Rice emphasised that its efforts would be dedicated to eliminating only unnecessary noises. The society recognised the fact that much noise was simply unavoidable, and its members had no desire to interfere with the vital commerce and business of the city. This emphasis enabled them to enlist the support of business organizations that might otherwise have resisted their efforts. It also tapped into a larger cultural trend that was increasingly valorising the principle of efficiency and its corollary, the elimination of all things unnecessary. (Thompson, 2004: 122)

Although noise was the main (declared) focus of the NAC, there was a lot of flexibility when it came to the definition of 'unnecessary noise', especially when it comes to sounds that businesses make. It was not quite an attempt to 'eliminate all things unnecessary', as Thompson argues, but rather the reorganization and production of more efficient and, importantly, more economically beneficial sounds. It is important to bear this in mind, and also to consider that Bell Labs and the automobile industries collaborated with the NAC while they were the main sources of noise. Therefore, as will be shown below, the main suggestions of tackling these noises were not directed at these companies, but towards the citizens of the city and their 'uncivilized' behavior. As the city started to change its infrastructure and sonic texture, people were becoming a nuisance to the machines and trade zones, especially the unwanted citizens of the city. The objectives of Bell Labs were slightly different, as it indicated in its report:

> Since the primary object of this survey was to gather information for telephone studies, the noise was measured in each case near a telephone instrument; and, in any case where a selection of conditions was necessary, it was endeavored to simulate conditions which would obtain when a telephone call was placed. The noise was taken to include any room sounds which would tend to interfere with telephone conversation. (Brown et al., 1930: 154)

Although the NAC's goal was to measure the city to understand noise sources in different areas, Bell took advantage of this project to advance their business and produce more knowledge. This enabled them to create a database to be used for various products and services. In order to create an understanding of the city's rhythms the company wanted to know when people did things. Bell conducted **measurements** according to the times of the day that people made most calls,

which were determined by a telephone traffic study conducted earlier. Bell listened to the city by monitoring and measuring various locations with its devices according to its units and produced knowledge about people's times and spaces. It recorded these data and created a database, statistically mapping the city's soundscape. Importantly, Bell established which sounds will be categorized as noise. In an article based on some of the measurements made as part of the NAC operation, Bell researchers argue:

> In this joint work, noise is taken to mean any extraneous sound which would tend to interfere with telephone conversation. Room noise is used to include any extraneous sounds at the place where the measurement is made, except those proceeding from the telephone receiver. It thus includes, in addition to noises such as the rattling of papers or the roar of street traffic, any other sounds extraneous to the telephone conversation, for example, those of other conversations or of music produced nearby. (Williams and McCurdy, 1930: 652)

In other words, Bell Labs' main purpose for measuring noise was to understand what sound sources interfered with the telephone system. Specifically, the company wanted to know the place and time the interferences occurred to determine changes of sound rhythms—a statistical measurement of behaviors measured using its devices and units—which could help identify irregularities. Thus, any sound, behavior, or activity that could potentially hinder transmission of conversations on the telephone was categorized as noise. However, not all sounds and activities were classified as noise, and the selective process of producing different sounds and behaviors had its own politics. In this way, several interest groups managed to remix NYC according to new technologies and measuring units, while presenting them as 'objective'.

As part of measuring the city, Bell used its new unit of measuring sound, called the *decibel*, to be measured with two new instruments: the *noise meter* and the *audiometer*, "the former yielding a purely physical measurement, the latter a measurement which involves the organs of hearing of the observer" (Brown et al., 1930: 120). The noise meter consisted of a delicate microphone that converted sound waves into electrical currents, which were amplified and went into an electric meter where a needle showed the intensity of the noise levels. The audiometer contained a phonograph that produced a test tone and required a human ear that came in the shape of Bell engineer **expert** (called the 'observer'), who had his other ear exposed to the city and adjusted the intensity of the tone until it was audible. In this way, the 'observer' knew when his ear was 'masked' (covered by the sound) by the city's noise, it corresponded to a curve called the noise audiogram,

which he observed and reported. Despite being called an 'observer', Bell experts had to adjust their bodies to be able to *listen* to the city's sounds and monitor, detect and make judgments of categorizations that differentiated sound and noise. When comparing the two methods, Bell experts argued that:

> The meter method [noise meter], unlike the masking method [audiometer], avoids any errors due to variations in human ears. This advantage is offset to some extent by the fluctuations of the meter needle, which make it difficult to obtain the mean reading if the noise is unsteady as is the case with most room noises. (Williams and McCurdy, 1930: 658)

Here, Bell's **experts** reflected on the efficiency of each measuring device, while emphasizing that the more automatic method, the one with less human intervention, was more accurate. Despite believing that automating the measuring process is better, this method still had some problems with accuracy, which meant that the human **expert** was still needed to make the **measurement**.

Bell also used the audiometer for speech and hearing tests in collaboration with medical experts. As its experts argued, this instrument was "useful in determining the condition of hearing of individuals by determining the smallest volume of sound at a considerable number of different frequencies which the individual can hear" (Gherardi and Jewett, 1930: 4). The same device was used for **measuring** the 'bodies' of both the city *and* the people to determine abnormalities. For both measuring instruments, Bell **experts** had to know, operate, and interpret what they listened to. Importantly, these **experts** rendered the city's sounds along with people's behavior into quantitative standard units of what was 'normal' (non)human sound and what was 'unhealthy' noise.

The *decibel* was the new term Bell Labs gave to the telephone transmission efficiencies and levels unit (Martin, 1929: 1). This unit is a quantification of the ratio of intensities and does not represent an absolute unit. This relativity is established by the positioning of the audiometer's microphone towards the desired source of sound and the interpretation of the listening of the recorded noises that were made by **expert** engineers from Bell Labs. As with doctors, the learnt expertise of the positioning of the devices determined the condition of the body. The decibel shows the relativity and arbitrariness of this **measuring** technique and points to the construction of power of those who have the expertise to measure, interpret and determine the results—Bell Labs engineers.

Despite this, in the City Noise report the decibel was portrayed as a unit of loudness (Brown et al., 1930). Bell wanted to make its measuring unit—the decibel—the standard unit for measuring and representing sound. As its managers

argued, there was a need "for the standardization of all apparatus, communication systems and operating methods to the extent that such standardization is helpful" (Gherardi and Jewett, 1930: 4). Bell was determined to move their technical discourse outside the engineering world and naturalize it in the everyday life discourse. Just like people today say Google as a phrase to find something in a search engine, Bell too wanted to make sound related concepts as its exclusive descriptor. Bell wanted to **license** its position as the main authority for the production of sound. Bell aimed to take over the discourse of sound and noise, originally meant for their apparatuses, and turn it into the dominant one for any (sonic) representation by using their unit of **measurement**.

Although the decibel faced competing measuring units at the time, such as the *sone*, the *wien*, and its strongest competitor, the *phone*, Bell managed to surpass these. As Karin Bijsterveld argues:

> Research institutions had taken the ICA's[3] standardisation of the units measuring noise seriously, and fostered the embedding of the phone and decibel in material practices, such as measuring instruments and graphs. Within the world of policy, however, talking about noise in terms of decibels eventually won out from expressing noise in phones. Most likely, a widely quoted review of noise surveys presented in decibels, published by Rogers H. Galt who was a Bell Telephone Laboratories employee, may have influenced this outcome. (Bijsterveld, 2008: 108)

Since the NAC's campaign was presented and discussed in various media such as radio and newspapers, as well as municipality laws, Bell Labs' collaboration with the NAC promoted their measuring unit as the dominant standard. It also helped establish the company as the main sound authority, thereby promoting its other businesses, which will be discussed below. Harvey Fletcher's strategic position in the Acoustic Society of America, and fellowship of the Organizations for the Hard of Hearing probably helped to standardize Bell's decibel unit over the other measuring units.

Mapping City Noise

Human senses have always been a target for manipulations aimed to redraw the boundaries of people and spaces. In the 18th and 19th centuries, strategies of governmentality on air in French and American cities were deployed to produce classes of odours, populations and territories. This was done using technologies of

pavements, drainage and ventilation, which made the city's circulation of goods and people more efficient. More than that, these technologies connected morality to healthy/clean/non-smelly bodies. As Alan Corbin argues, "olfactory[4] vigilance not only aimed to detect the threat, the risk of infection, but also entailed a permanent monitoring of the dissolution of individuals and the self" (1986: 21). He observes that:

> By mapping the flux of smells that made up the olfactory texture of the city, these observers located the networks of miasmas through which epidemics infiltrated the capital. Much later, this new view of urban space gave rise to a fresh reading of society … Not until the nineteenth century did sanitary reformers use tactics that created a clear distinction between the deodorized bourgeoisie and the foul-smelling masses. (Corbin, 1986: 55)

Mapping cities according to sense taxonomies by using specific technologies and measuring units was also conducted in NYC, a century before the NAC. Melanie Kiechle discusses the 19th-century sanitation reforms in the US. On February 26, 1886, a new public health law was passed in NYC that founded the New York City Metropolitan Board of Health. This board created a stench map of New York and Brooklyn's offensive (unsanitary) trades, trying to locate the sources of the nuisance and move them somewhere else. As Kiechle argues:

> Alternative approaches pushed stenches to the city's margins through the construction of sewers and relocation of slaughterhouses. Despite the Board of Health's success at changing the city's physical geography, control of the olfactory geography remained elusive. Stench-laden winds created conflict between the residents who trusted their noses and the officials who now determined the definition of fresh air. By the 1870s, conflicts over olfactory geography and knowledge of stenches' sources pitted bodily experience against scientific expertise and government authority. (Kiechle, 2015: 2)

According to Kiechle, Dr. John Hoskins Griscom, one of the main advocates of air reforms and a leader of the sanitary movement, initiated a survey of the city's living conditions. This survey led to the *Report of the Council of Hygiene and Public Health of the Citizens' Association of New York upon the Sanitary Condition of the City*. The investigation and report were conducted by physicians and chemists, who functioned as 'competent **experts**' examining each of the 31 designated sections of the city, and creating a thorough and detailed map of odours. The **experts** at that time were building new technologies for water systems (including water pumps), sewers, and canals that sanitized both the water and the air. Only

experts' opinions would matter in legal settings, argues Kiechle, and NYC's Metropolitan Board of Health designated an Inspector of Offensive Trades, chemist Samuel Goldschmidt, to deal with citizens' complaints.

In the 20th century, similar practices were deployed in the same city to produce a noise map that legitimized specific people, commerce, places, technologies and behaviors while de-legitimizing others. Noise **measurements** were given logarithmic numbers in decibels, which meant nothing to most of the population. What it did give them was a new discourse and vocabulary to express their everyday lives, all sponsored by Bell. These figures were calculated to establish an 'average' noise level for various places and machines across the city, while the people who were assigned to determine these 'norms' were Bell Labs engineers.

Together with Johns-Manville and the Department of Health, Bell Labs travelled with a truck all over NYC, and "collected 10,000 measurements at 138 locations" (Thompson, 2004: 158). Bell Labs' measuring machines "permitted the preparation of a 'spot map' of noises, and the quantitative analysis of the intensity from various sources" (City Noise, 1931: 1139). This is also clearly mentioned in the objectives of NYC's Commissioner of Health, who said that:

> We need a complete classification of noises; a tabulation of intensity geographically arranged; some scientific measurements of principal city noises, together with specific recommendations as to their control or elimination; We need a scientific statement of the effect of noise on the human being; We should have some scientific measurements of certain types of noises; and recommendations as to what constitutes the border line of reasonable inevitable noise and unreasonable noise. (Brown et al., 1930: 3–4)

It is exactly this 'border line' of what is reasonable and what is unreasonable noise that Bell aimed to construct along with the NAC and according to their economic rationale. As Elden (2010) shows above regarding maps, these were political strategies to produce territories. Such visualizations and quantification of the city's noise and the places where it occurred made it easier to restructure the architecture and consequently the way people behaved in these spaces according to different groups' interests. Specifically, it meant that real estate companies and insulation companies, such as Johns-Manville, could know where and how to develop their businesses according to such maps, and what would need to be restructured to do that.

In NYC, at the end of the 1920s and the beginning of 1930s, some citizens could no longer tolerate the noise and complained, which gave the perfect opportunity for the NAC to intervene and show how much the Commission was

needed in the city. It was also the time of the stock market crash that resulted in one of the largest financial crises of the 20th century. The stock market crash required a reorganization of territories and populations, and media technologies could help with this. As Lana Rakow argues, "[u]rban zoning of residential and industrial areas, popular around the turn of the century, was supported by telephone companies and utilities because the companies were uninterested in business in poor or deteriorating neighbourhoods" (1988: 191–2). A new order was needed.

To understand which noises were more disturbing than others, the NAC conducted a questionnaire. It circulated the questionnaire with the help of NYC's newspapers and received 11,068 responses. The questionnaire gave a predetermined list of sources that produced noise; all the citizens needed to do was to fill in the area and time of the occurrence. If a citizen wanted to add a source that was not listed in the questionnaire, she would have to write a separate letter and attach it to the questionnaire. In other words, if she thought there were different noise sources or had a different view about it altogether, then she would have to make an effort to report this; that is, a bigger effort than filling out the questionnaire and sending it. Considering the huge numbers of immigrants living in NYC who might have not been able to read or write in English, this questionnaire already excluded the group of people it was going up against.

According to the classifications presented in the questionnaire's results, it was apparent that most of the sources of NYC noise originated from machines: cars, buses, motorcycles, trains, and radios. Noises produced by people were positioned at the bottom of the list. However, these were the noises that were addressed for control, management and education (as I will show below). The responsibility for causing the noise was placed on the lower social classes or foreigners who needed to be educated and managed. The inventors of the machines mentioned in the questionnaire, including Bell Labs, were exempt from any blame. The automobile industry was encouraged to replace its horns to decrease noise, but their control or elimination was never raised as a policy issue.

More than trying to work out the sources of noise, it seems that the main purpose of the questionnaire was to quantify the sources the NAC had already established as noisy. By doing so, this database enabled the NAC to finally have a tangible number-based 'scientific' proof that would consequently help to form legislation and control over these noise sources and practices, be they human or non-human. The quantification of sound finally made it possible to 'capture' noise, as an immaterial, elusive form of knowledge. It was possible to render it from its abstract slipperiness into Bell's quantitative **measurements** and mechanical tools,

and then use it against different groups and behaviors that the NAC found problematic. Bell Labs **experts** tested whether there was a correlation between the noise of each source and the frequency of complaints against this source. They found that:

> It can be definitely stated that the level of the noise is not the sole factor which determines its annoyance as measured by the number of complaints. In a broad way, it does seem that a factor combining the noise level and the frequency of occurrence is definitely correlated with the annoyance. However, the degree of annoyance seems to depend at least to an equally great extent upon other factors—possibly the component frequencies and the general character, whether steady or intermittent—and whether or not the noise is commonly regarded as quite unnecessary, such as the squeaking of brakes of automobiles, or as relatively necessary, such as police whistles. (Brown et al., 1930: 147)

Hence, level of noise was only one factor; frequency and how people think about the noise also mattered. People had to be educated on the kinds of noise they should care about, however, even in this example, although automobiles sounds were considered unnecessary, their manufacturers did not receive sanctions, particularly because they were part of the NAC's group of sponsors. Instead, other sources, groups of people and their activities were the target and had to be categorized as noise that was more annoying. As Karin Bijsterveld argues, educating the 'uncivilised population' was the main purpose of the noise abatement:

> [S]ound continued to be associated with social distinctions and noise with a lack of manners. Consequently, public education by teaching a 'noise etiquette' came to be seen as the alpha and omega of controlling the city noise problem. Although practical measures such as alternative pavements and new transportation constructions were also proposed and executed, public education continued to be seen as the ultimate way of creating silence: it kept dominating the rhetorics of noise abatement. (Bijsterveld, 2008: 39)

According to Bijsterveld, the solution sought by the NAC was *not* to eliminate various technologies such as radios and automobiles. Rather, the most effective solution was teaching the population that noise was unhealthy, dangerous, and inefficient. This also shows that not all people were aware that they should care about noise; therefore, the Commission felt it had to guide them to establish a new norm. The NAC argued that, one can "see how the vast majority, who are not conscious of the injury being done to them by noise, must be protected

from harmful preventable din by the Authorities responsible for the health of the community" (Brown et al., 1930: 288). In this way, noise was constructed as a source of health issues, and people had to be educated to take better care of their bodies for their own safety, but more importantly, for society and the city.

Part of this education was through **training of the body**. From the very beginning, noise was linked to health problems. These arguments were backed by scientific medical evidence of damage to the mind, emotions, blood pressure, heart rhythm, auditory organs, nervous system, metabolism, sleep, efficiency, and mental well-being. Similar strategies were deployed, as shown above, in the 18th and 19th centuries in French cities concerning the sense of smell. Corbin argues that "[d]eodorization would ensure the appearance of a new body" (1986: 104). By **training their bodies** and self-caring while monitoring their peers to be healthy and clean, new bodies were created, sound subjects clean from noise.

Similar to stench, it was difficult to prove that these injuries were directly caused by noise. Although Bell Labs' equipment provided tools and a measuring unit to quantify noise, it was not visible or material. Since scientific knowledge production and claims of objectivity and authority were usually made by notions of seeing and vision, sound was more difficult to establish as a viable way of knowing. According to the *American Journal of Public Health*, which addressed the NAC's operation:

> [N]o correlation has been made between these physiological and psychological effects of noise and the data collected in the scientific study of the intensity of noise from various sources. It seems to be impossible, therefore, at present to select an intensity value, or 'noise level' which would separate noises of public health significance to the general public and those of no such importance … In this way, it is not necessary to prove the public health significance of any specific noise or group of noises in order that they may be controlled or eliminated. Hence it is possible in the present state of knowledge to instigate noise control measures. (City Noise, 1931: 1139)

As it was difficult to link physical and psychological damages to the noise **measurements**, all noises became important, thus justifying the kind of action undertaken by the NAC. An even greater power, a **license**, was given to Bell **experts** by not having to justify or ground their arguments with actual proof. More accurately, specific noises mattered, and did not need any proof of direct correlation with health problems or illness in order to control and eliminate them. This ambiguity served those in power to determine and classify which noises were harmful.

The discussions were mostly about the effects of noise on the efficiency of 'brain' or mental workers. This meant that noises that affected the higher classes were constructed as unnecessary. Other people, usually from the lower classes who were doing more physical work in factories and were exposed to louder sounds were not presented to be in danger. The sound they were exposed to was not constructed as harmful. As the NAC report suggests:

> As to the matter of deafness caused by noise, the committee noted that the struc-
> ture of the ear makes it continuously adaptable provided these sounds merge and
> maintain a more or less uniform level. In traffic and many other city noises this
> is not the case. (Brown et al., 1930: 19)

People from lower classes were presented as more adaptable to such high-level sounds, whereas 'brain' workers were more sensitive and not able to experience and adjust to such conditions. As the report argues, it is a "proven fact that, to the busy brain worker, to the sick, the nervous, or the wakeful, noise is a serious menace to which adaptation may be impossible" (Brown et al., 1930: 250). Such brain workers, who worked in offices, were the main examples given in the report of people who suffered from noise. Such 'brain workers' worked in offices or in their homes, making the street the prime noise source that affected their efficiency, energy, and fatigue in output. In this way, noise also provided the possibility to control, manage and police forms of commerce, especially unregulated street commerce. It was an opportunity to restructure the new labor force according to the new emerging market the Industrial Revolution introduced.

No Deal on the Street

Part of the NAC's effort was to combat, among other things, vendors, peddlers, and hucksters, who were people from the lower classes and immigrants trying to sell products on the streets, usually because they could not afford to rent or buy a store. The main problem with these people, according to the NAC, was their selling and advertising practices, which involved going through the streets and shouting to get attention, and hopefully buyers. This 'inappropriate' commerce activity infuriated intellectuals who had to work in their homes and felt (sonically) attacked by these 'barbaric' advertising techniques.

According to John Picker (2000), this privileged class of Victorian professionals who worked from home wanted to reshape the boundaries of the urban territory's private and public spaces. Picker argues that "the room itself signified a professional seizure of domestic space, an architectural tactic that encapsulated the oddly

positioned existence of silence-seeking professionals whose living and working spaces overlapped" (2000: 429). This demonstration of power was manifested, according to Picker, through the domestication of the streets, and enforcing silence sensibilities as the correct way to behave across wider urban environments. This was established even before the formation of the NAC by the SSUN, in 1909, in New York City, with a new ordinance:

> No peddler, vender, or huckster who plies a trade or calling of whatsoever nature on the streets and thoroughfares of the City of New York shall blow or use, or suffer or permit to be blown upon or used any horn or other instrument, nor make, or suffer or permit to be made, any improper noise tending to disturb the peace and quiet of a neighbourhood. For the purpose of directing attention to his ware, trade, or calling, under a penalty of not more than $5 for each offence. (1909: 7)

As the ordinance shows, there is a lot of interpretations that can go into what is 'improper noise' or disturbance of 'peace and quiet'. And this is precisely where Bell's **experts** could intervene and turn their knowledge into the truth discourse. As a direct continuation of the SSUN, the NAC also aimed at controlling the unlicensed sellers who were usually foreigners who could not afford proper stores. This, as Daniel Bluestone argues, is "a decades-old effort by various civic, political, and business interests to conquer the 'pushcart evil', regulate street commerce, and extend Progressive Era crusades for a beautiful, clean, and efficient city" (1991: 68). Bluestone examines peddlers and merchants in NYC between 1890 and 1940, and argues that proposals to prohibit merchants from the street were inspired by the ideal of a frictionless transportation in the city, where (poor) people on the street interfered with the growing presence of automobile traffic. Additionally, more important cause was to diminish other forms of social uses of the street including political actions, social gatherings and entertainment. The urban street, Bluestone argues, became a marker for social and economic distinctions.

Furthermore, according to Bluestone, as retail shops and arcades became more popular at the end of the 19th century and the early 20th century among the middle and upper classes, "the streets were left to the growing ranks of the poor in the expanding urban populations … Hundreds of thousands of poor immigrants familiar with European street markets and anxious to buy as cheaply as possible" (1991: 71). Thus, the 'profile' of both the merchants and their customers was poor and foreign. The regulations of the city, argues Bluestone, were designed towards those who did not fit into the legitimate trade practices. Big shopping buildings

that started to dominate public spaces across the city's territory and gather people around consumerism were promoted and these sensibilities would continue online, as the next chapters will show.

This is demonstrated by the fact that sound was permitted only in specific centralized spaces for shopping and commerce, specifically upper-class retail shops. In 1922, General George Squier invented Muzak, which was originally meant to deliver music over the telephone, and quickly became functional music for increasing the efficiency of workers in factories, and also for a better shopping experience. In these cases, the music's goal is to create a continuous rhythm that creates a different temporality, stretching the experience of time (whether shopping or work) longer and making it easier and more pleasant. This illustrates the thin (arbitrary) line that determined what kind of sound was legitimate and what constituted noise.

Examining Muzak as functional music, Simon Jones and Thomas Schumacher (1992) argue that it was used as a 'disciplinary technology' in workspaces, especially under the emerging paradigms of Fordism and Taylorism. They argue that the main goal of Muzak was to lift the spirits of workers who were starting to feel tired when they worked and to motivate them to continue being productive. This strategy is a way to combat machine noise by introducing another specially designed and scientifically examined sound. Jones and Schumacher (1992) suggest that Muzak was a method of re-organizing time in factories that created a feeling of movement with the music but restricted and controlled the bodies of the workers. Muzak was a way to conduct rhythmedia to produce factories—territories—where efficient worker subjects were produced, to increase profits. Further, they argue that:

> The deployment of functional music in the factory was part of a general trend toward increased 'social engineering' in industry. The knowledges and discourses of behavioral social science were placed at the service of industry and incorporated directly into the practices of Fordism and Taylorism in the forms of industrial psychology and labor/management studies. Under the gaze of these knowledges, the behavior and consciousness of workers became objects of 'scientific' investigation and observation, to be quantified, categorized, and manipulated. (Jones and Schumacher, 1992: 159)

The (re)ordering of different spaces was part of media companies way to conduct rhythmedia to 'social-engineer' individuals into more productive workers and consumers. It aimed to produce new, more efficient body rhythms, by **filtering** and excluding those that were non-productive, categorizing them as noise. Muzak

signified a desire to control the efficiency and experience of people in spaces, to push them to behave like productive workers and consuming subjects through a social engineering of their bodies and minds.

While Muzak produced work and consumer subjects, there was a need to get rid of others who interfered with the frictionless operation of the city and the streets. Therefore, even when some merchants did have stores, the way they chose to advertise their products (e.g. putting loudspeakers on the street to call attention to their business) was criticized and attacked. This was part of the NAC's goals for the new organization of the city towards big retail stores and catering for other companies. Radio noises presented a problem of inappropriate advertising by private stores, according to the NAC:

> There are two parts to the problem of radio noise; of these the worst and most often complained against is the use of blaring loudspeakers on the street to attract attention or to serve as advertising. Closely allied in this respect with the window buzzers and other racket makers of cheap clothing merchants and auctioneers, the commercial street loudspeakers must be operated at great intensity to be effective … Protests to the owners were useless; they refused to be reasonable or courteous, maintaining that every man has a right to operate his business and its advertising as he pleased—a specious argument which, if carried to its logical conclusion, would make the city uninhabitable! (Brown et al., 1930: 50)

It seems that this was a case of a clash of cultures and rights; who had the right (then translated to **license**) to advertise, when and in what way. Thus, a legal solution was introduced to solve this dispute. To control shop owners' disturbing loudspeaker advertising practices, a change was made by the NAC in the *Practical Application of Remedies to Sanitary Code*. Similar to the previous laws, this code emphasises ambiguous terms around 'excessive and unusual noise', which left a lot of room for **experts** to intervene and decide what excessive sounds are. A few weeks before that, another amendment was approved, on 20 May 1930, to the *Code of Ordinance*, which indicated the following:

> Sec. 13 7. Radios, phonographs and other sound devices. No person shall use or operate, or cause to be used or operated, in front or outside of any building, place or premises, nor in or through any window, doorway or opening of such building, place or premises abutting on or adjacent to a public street or place, any device or apparatus for the amplification of sounds from any radio, phonograph or other sound-making or sound-reproducing device without a permit from the police commissioner therefore, nor in any case within two hundred and fifty feet of a school, court house or church during the hours of school, court or

worship, respectively, nor within two hundred and fifty feet of any hospital or similar institution. (Brown et al., 1930: 52)

This Code suggests that to have a promotion device people needed a **license** provided by the police. Since these media devices were new, there was a need to start outlining their 'terms of use', and these laws and permits can be seen as early guidelines of the limits and boundaries of what could be done with these machines. This is a strategy to standardize advertising, a topic which I will elaborate further in the next chapter. In a special article for the *New York Times*, the Health Commissioner of New York City, Dr. Wynne W. Shirley, wrote about the NAC, and flagged how these rules served as tools in the hands of the citizens to monitor and report noisy citizens:

> In these two regulations a forceful instrument is put in the hands of New Yorker's if they will but use it. Only through the constant application of such laws can the public be led to form new ways of public courtesy. Already 110 volunteers have realized this and for a week have devoted eight hours a day of their time to patrolling the city and reporting violations of the ordinance against sidewalk loud-speakers. (Wynne, 1930: 113)

Presented as a 'forceful instrument', peer policing was portrayed as power given to citizens. Thus, it was not only the responsibility of the authorities to police city noises; citizens were encouraged to monitor people who were noisy, in a social reporting way, exactly as Foucault described in his work on biopolitics. Foucault emphasized that biopolitics is achieved not only by governing a population but also by the continuous monitoring of one's peers. In this way, power does not have to be enacted from above but from below and in between people who internalize the legitimate way to behave and discipline their peers. Thus, the **training of bodies** in the city was enacted by the authorities *and* citizens to produce disciplined citizens subjects. In this way, the citizens would be 'empowered' to police noisy behaviors and groups of people that interfered with businesses. This was expressed in the section dedicated in the report titled 'What can we citizens of New York do about noise?':

> If the citizens of New York really wish to do away with unnecessary noise and to reduce to a minimum such noises as are necessary, they can accomplish it if they are willing to take a little trouble. They cannot take the law into their own hands; they must act for the most part through the police. If they are vigilant and have the courage to speak to the offenders and threaten them with an appeal

to the police or the law, and will do their part in helping the officers of the law, they will be surprised to see how rapidly things will improve. It is all a question of public opinion. If that is once aroused we can enforce the laws we have and, if we need others, obtain them. (Brown et al., 1930: 273)

This shows citizens were encouraged to police and threaten their peers when they 'violated' noise laws. As not all people were equal, specific groups of people were the target of such policing (this still happens to this day, check #DrivingWhileBlack). It shows how training was important to change the public's opinion and understanding regarding what was unnecessary noise to encourage people to act and educate others. This was emphasized a few years after the NAC's report:

Thousands of letters specify the screeching of news vendors, bawling 'Extra!' at all hours. The shouts of hucksters are anything but musical street cries to the frayed nerves of the populace. The brazen-lunged old-clothes man, whose 'I-Cash-Clothes' shatters the peace of the side streets, is frequently complained of. With public cooperation, many of these disturbances may be eliminated … 'We'll never get rid of those until we can change human nature,' is the net conclusion at City Hall. (Mackenzie, 1935: E12)

It was precisely 'human nature' and the way it operated and understood that was the target of the NAC and Bell, and they harnessed every scientific tool and persuasive method they could use to strategically restructure these seemingly natural options in the city. The nature of this 'human', however, came from a particular racial identity and socio-economic position. In order to attain status as this ideal 'human', people needed to be trained, through education, as well as other norm-establishing practices. The police would give a $5.00 fine for the violation of such offences of being noisy to educate through an immediate punishment, which they believed would deter more powerfully than harsher actions. This punitive move was accompanied by a collaborative campaign with local radio stations with the goal of educating radio listeners in the appropriate noise etiquette. Radio stations broadcast special announcements for a period of four to six weeks, every night at 10:30, reminding people not to annoy their neighbors and to curb the volume.

This campaign, along with the other educational programs that the Commission set forth, were **training programs** for people to learn about the kinds of noise they should care about, and which they should classify as unnecessary, harmful and uncivilised. As the NAC argued, "many people are thought-less—uncivilised—in its use … Obviously the fault is not with radio at all, but with people who have not developed their consciousness of the rights of others" (Brown et al.,

1930: 253). The NAC was there to help people learn how to be civilised, how to become good citizens of the city who do not burden or produce excessive noise. Bell's measuring practices enabled producing people and objects behavior according to what they consider to be 'social'. By doing so, they hold a powerful position in producing and ordering people and territories.

Selling (the) Telephone

Producing unwanted forms of commerce and trade came hand in hand with producing other, more appreciated forms of selling. Since noise was portrayed as harmful, unhealthy, and uncivilized, services and products that could prevent or decrease it were developed. It was easier to sell noise-prevention, -reduction, and -elimination products and services since noise became an object. Noise was produced as a commodity, a **measurable** unit, something that could be located to specific objects, or to specific human characteristics and behaviors. This newly-discovered tangible object was a fertile ground to construct new power relations, expand existing ones and, most importantly, monetize them. Now noise could be a quantitative *flexible* unit and, therefore, it could be used to control, manage, govern, and manipulate people. The decibel diffused into everyday discourse to describe experiences most citizens did not understand or grasp the meaning of, or, indeed, how it was being measured. Nevertheless, it became a term to distinguish between legitimate social behaviors and their deviant counterparts.

Thus, establishing noise as a measurable, quantitative and *tangible* thing, also helped Bell to promote both the decibel as the new measuring unit for loudness and its new Acoustic Consulting Service, launched in January 1931. Just as small, cramped places needed to be ventilated to have sufficient sanitary conditions, they would also need to be insulated from noise to ensure they were healthy spaces for living. Thus, this service offered an engineering consultancy for noise abatement and acoustic control:

> The instruments and theories developed in the Bell Telephone Laboratories have proven most adequate. Noise analysis and the preparation of specifications for its control has offered a widely diversified field; and nearly every problem has necessitated a different application of engineering principles. (Wolf, 1931: 191)

As each new noise problem was created or found, a new service was developed by Bell, whereby only its **experts** were qualified to locate, measure, analyze, categorize, and handle the situation. In this way, Bell gave itself the **license** to 'solve' the problem of noise which it helped create. Carolyn Marvin, who wrote extensively

about electrical engineers proliferating power during the end of the 19th century, argues that "[t]heir job was to engineer, promote, improve, maintain, and repair the emerging technical infrastructure in the image of an existing distribution of power" (1988: 9). Bell engineers' expertise and **measuring** devices meant that they had the exclusive **license** to provide solutions and safety against noise.

During this period, some salesmen had specific territories where they went door-to-door at customer's houses, and Bell, in an attempt to encourage usage of the telephone, wanted to make clear that the telephone could help them manage their customer relations. As Bell emphasized, this could be done by making appointments via the telephone, maintaining constant contact with customers between sales and enabling salesmen to preserve these relationships (and therefore their territories), no matter what physical problem they might have (if they were injured or sick, for example). Thus, at the end of the 1920s, Bell had started to produce the *Key Town Telephone Sales Maps*, which were basically sales territories and the telephone fares:

> All of the Bell operating companies have prepared key town sales maps of the states in their territories, available for the use of sales executives. In addition, there is available a Key Town Telephone Sales Map of the United States showing all primary calling area boundaries, and all primary and secondary calling points, as well as a large proportion of the cities having one thousand or more population. The key town designations and area lines have been shown in red to make the map easier to use in plotting sales territories. These maps are one of the aids furnished to facilitate the use of the key town plan, and, therefore, to further the use of toll service, making its use easier and more convenient for customers. (Whitcomb, 1929: 53–5)

These maps helped companies see how the telephone was a valuable and necessary tool for making business, while taking advantage of the different territories of the city. The maps showed the telephone price rates of each region, the average cost of a call in the area, and primary and secondary calling points. The towns shown on the maps were selected by their high proximity to trade territories, their central locations, transportation availability, hotels, and every other criterion that mattered for making efficient sales. In this way, Bell wanted to organize itself in relation to already successful architectures to 'ride on their backs' and monetize their success while also creating new spatial and temporal organizations. From Bell's point of view, department stores were of great interest because people used telephones to purchase products from them (the department stores):

> Most important in the list of telephone-merchants are the large retail stores in our big cities. It is not uncommon for them to have twenty, thirty, or even more sales people in constant attendance to handle telephone orders and inquiries, besides making great use of the telephone for other purposes. (Shaw, 1933: 115–16)

Therefore, Bell's involvement with the NAC fulfilled another goal they both shared: to get rid of street commerce (pushcarts and vendors) in favour of retail stores. These stores indirectly helped to advertise the telephone company as well, as they encouraged their customers to make purchases over the telephone. Therefore, Bell started what it called *co-operative advertising*, which helped both the stores and the telephone company to increase their respective sales. Bell tried to convince people to buy from retail stores while using the telephone: "the telephone company is attempting to aid the formulating process by telling the readers of this same newspaper why they should shop by telephone. But it does so in a still small voice as compared with the thunderous tones in which the stores themselves talk to the shoppers" (Shaw, 1933: 117). Bell tried to make these ads look natural (or 'organic', as Facebook terms it—see Chapter 5), not directly saying that people should use their devices and services but subtly nudging.

At the same time, Bell insinuated that merchants should promote their services by clearly indicating their phone numbers in their newspaper ads—a strategy that it argued would increase sales. In this way, Bell aimed its advertisements at both consumers and merchants, while giving priority to big retailers and wealthy people who already had phones. It wanted to train them to adopt new trade practices that would emphasize the need to use the telephone to buy products, to produce new consumers and advertisers. One of these ads was called *Shop by Telephone*:

> Do you know this woman, Mr. Merchant? How fond she is of ease and comfort. How alive she is to new ideas—how quick to cast aside old ways. How keen she is to recognize bargains—how immediate her response to them. How ready she is to patronize those who do business in the way she likes to do it. If you know this woman, you know that the telephone has become a part of her very life. If you know this woman, you will keep your telephone number ever before her, as a constant reminder that you are always at her elbow. It will pay you to tell her, when you talk to her or advertise to her, how welcome she is when she comes to you by telephone. (Shaw, 1933: 118)

It was exactly persuading people to make the telephone 'a part of their life', as the ad claimed had already happened with the woman in the illustration. This was

Bell's aim, to produce the telephone apparatus and services as part of people's lives and relations with other people and services. During the 1930s, Bell conducted several experiments in collaboration with department stores which showed how sales increased when using the telephone for trade. These findings were accompanied by advice that encouraged the advertisers of these stores to understand the importance of selling over the telephone in order for them to show telephone numbers more explicitly and prominently in their newspaper ads (similar strategies would be used with Facebook and the 'Like' button—see Chapter 5). Furthermore, other recommendations on how they should help advertise the telephone were by:

> [A]ccurately and completely listing and advertising the store telephone numbers in the telephone directory, featuring the telephone number in their newspaper advertisements, printing it on letterheads and bills and inserts, announcing it during promotional radio broadcasts, and publicising it in every practical way. (Gay, 1938: 180)

In doing so, Bell was intervening in advertising practices while, at the same time, promoting and trying to standardize the telephone by aiming to integrate it into people's lives. In addition, retail stores' sales data could help Bell discover new markets, relying on the shopping habits of people, which indicated where wealthy consumers were and how they behave. Therefore, Bell analyzed the 1930 U.S. Census, which helped it determine which territories were more profitable and, therefore, worth its investment:

> Whether a trade territory measures the area within which there is an effective demand for a given product or whether it merely represents the limits which present organization permits a firm to cover, knowledge of where the majority of the sales are made is useful in furthering the use of communication facilities in the sale of merchandise. (Bolles, 1933: 277)

Diminishing unlicensed street commerce was part of Bell's strategic move to persuade companies that using the telephone as a main device for selling could lower operating costs and establish more efficient organization and distribution. This attempt to promote new services should be understood in light of the financial crisis after the 1929 stock market crash, which Bell experienced quite harshly. Lana Rakow argues that this forced Bell to change its business strategy: "[t]he shrinkage of the number of telephones in service during the Depression led Bell Telephone to expand its marketing approaches to include encouraging the social use of the

telephone, a use the exchanges had seemed to frown on until then" (1988: 191). As will be shown below, Bell was competing with other smaller and independent companies, but wanted to brand itself as a prestigious service and product through its telephone operators. Portrayed as objects of desire, telephone operators were first marketed to business men, but the crisis meant that Bell needed to expand its marketing to more social and everyday use of the telephone, appealing to a wider audience.

Furthermore, according to Gertner, "[i]n the course of three years, between 1930–1933, more than 2.5 million households, most of them Bell subscribers, disconnected from the phone grid. In 1932 alone, the number of telephones with Bell service dropped by 1.65 million" (2012: 36). Only in the mid-1930s did the situation improve, with increasing numbers of phone subscribers and company revenues. Therefore, these strategic moves were meant to expand Bell's ability to make some kind of profit from its skills and equipment, and integrate and shape its position and discourse as a vital necessity for society.

Shutting Street Noise

The urban soundscape is also structured by the architecture of the city, and places such as Union Square in NYC went through various orderings at the end of the 19th century and the beginning of 20th century. According to Joanna Merwood-Salisbury (2009), Union Square went through major architectural changes during that time that were influenced by political and economic factors:

> From 1900 until 1930 Union Square was torn up piece by piece to make way for two subway lines and a concourse connecting them, as the municipal government, in partnership with private companies, constructed a unified underground rapid transit system. During these years the proposed reconstruction of the square was a contentious issue. (Merwood-Salisbury, 2009: 550)

According to Merwood-Salisbury, Union Square, as part of NYC's unregulated acceleration of industry competition, accommodated many of the first union demonstrations and rallies, e.g. the Socialist International Workers of the World (known as the 'Wobblies' and founded in 1905). These masses did not gather in an orderly manner, which was something the municipality and interest groups (such as real-estate owners and shopping centers) feared. Therefore, there was an attempt to **de-politicize** Union Square in order to control the crowd, and to maintain the interests of property owners, real estate companies, and businessmen who owned the newly built surrounding trade centres.

The remodelled Union Square was designed by the Parks Department landscape architect Julius V. Burgevin, and it embodied, according to Merwood-Salisbury (2009), a historical territory. It demonstrated national political values rather than its previous space for political gatherings, workers' activism, and demonstrations. She says that in the age of the New Deal, the need for a visible civic center no longer seemed important. Public space was considered chiefly as a contributor to individual good health, not as a venue for mass democratic action (Merwood-Salisbury, 2009: 554). However, crowding that occurred in the big retail stores was allowed, and even encouraged. By conducting rhythmedia, a specific kind of crowding was produced as the legitimate, while the others were prohibited. This, again, was a strategy that was deployed in French cities, what Corbin calls an 'uncrowding' of places that were the main focus of sanitary reformers and allowed better control and regulation over populations. Corbin argues that:

> Uncrowding people and instituting a new division of the amenities of urban space were deemed effective means of achieving ventilation, controlling the flow of exhalations, and damming up the morbidic effect of social emanations. The crowding together of bodies was a constant challenge to natural equilibrium and called for a sanitary administration capable of establishing regulative norms. Those considering the problem of the distribution of space gave an essential role to smell. The body's spatial requirements were to be determined by measurement of exhalations. And the necessary spacing were to be governed by the forms of sensory intolerance we have already noted. (Corbin, 1986: 100)

Ventilation, according to Corbin, was not enough. Human behavior had to be changed, especially those spontaneous practices of mass gatherings that were perceived as particularly dangerous. There was a need for less chaos, more uniformity through **training of the body**, by reproducing a new body, a civilized self-monitoring body that at the same time monitored its surrounding, that would be more suitable to the new city.

Controlling (the Other) Street Rhythm

The education campaign that the NAC promoted across NYC was initiated was meant for those whose behavior was perceived as problematic, especially the African-Americans in Harlem. According to Clare Corbould (2007), Harlem's street life was presented in a very noisy way by the white media of NYC in the first half of the 20th century. She argues that:

> Harlem—or "Little Africa"—was special, according to these authors, because its sound reflected a primitive "rhythm of life," characteristic of those they deemed racially inferior. African Americans heard the noise, or sound, of Harlem, rather differently. To them, it indicated a distinctive and valuable culture. (Corbould, 2007: 861)

NYC, according to Corbould, attracted many foreign-born blacks, especially between 1913 and 1924,[5] when she argues, their numbers were the highest and saw the city as the second most popular state in which to live. Corbould argues that, for African-Americans, the streets were a space that embodied the opportunity to break the white upper classes' notions of private and public. They created their own interpretation of noise, including making noises from open windows towards the streets (by listening to the radio). Black Americans also ran alternative businesses such as 'rent parties' and 'buffet flats', which were basically bars in private houses. Reclaiming the city's noise, especially in Harlem, the 'Mecca of the New Negro', as Corbould calls it, was a way for African-Americans to claim a physical space that was not theirs. After all, they could not participate in all the leisure activities that white people took part in (bars, films, theatre, etc.), let alone be a part of the legitimate licensed businesses. Therefore, as Corbould argues:

> To hear, rather than see, was at once to pose a separate mode of existence, connected to a separate public sphere and a different history. Black Americans quite simply defined themselves using a different sensual tradition than that commonly associated with whites, that is, sound rather than sight. For many, the arena of sound offered more room for self-definition than did the field of vision, with its close relationship to the determination of a person's race. (Corbould, 2007: 872)

Sound allows us to redraw, challenge and reconstruct boundaries of space, body, and, agency. It enabled black people in NYC to create their own subjectivity. This is important to amplify because as we saw with our discussion of Foucault previously, these attempts to create specific subjects are not adopted automatically and there is always resistance. As Corbould argues, African-American actions were a form of civil disobedience, as the noise they created hurt and undermined the values of the white elite. Therefore, as she suggests, such actions can be understood as a direct political act that allowed for self-expression and subjectivities that were not allowed in the visual politics of the city.

Such practices, and especially jazz music, was created by Black Americans, were constructed as irrational and, therefore, noisy. As the NAC report mentions,

jazz-minded people are "people who can think on a subject only long enough to speak a sentence or two and then must leap on to the next subject helter-skelter like the motifs in a jazz medley" (Brown et al., 1930: 219). By refusing to acknowledge the organization of NYC's soundscape, Black Americans refused to correct their behaviors to the rational and civilised 'white' body. They composed their own rhythm.

This disobedience made its (sonic) mark as Bell's recommendations in the report of the NAC were directed exactly towards such street activities and aimed to restrict noise that was produced during the night, and in residential areas of the city, more harshly. The NAC produced a list of problematic people and practices along with recommendations on how to behave properly in the streets, with the title of 'Etiquette for the Street'. It expressed its concern as:

> '[T]he people upstairs' in many parts of town seem always to be staging gay parties with much music, dancing, and laughter; that youths and maidens grouped on front stoops sing in close harmony at unreasonable hours of the night; that brakes squeak; that horns toot; that street cars rumble; that ash cans clatter; that exhaust cut-outs roar; that traffic whistles set folks' nerves on edge— all this makes a clear sketch of what and where and when the noise of New York exists. (Brown et al., 1930: 217)

As this segment shows, the collaboration of the NAC with Bell echoed racial and economic discrimination. Bell considered Black Americans and foreigners as noise, interferences with its business. For Bell, it was "obvious that all classes of people are not equally important as present and prospective users of the telephone service … [N]ative whites constitute a better market than Negroes or the foreign born, while social and economic differences also have an important bearing upon telephone usage. Thus, the composition and characteristics of the population are of more interest to the telephone industry than mere numbers" (Tomblen, 1932: 50). Trying to produce its elite brand, Bell argued that it valued quality over quantity of the kind of people who used its technology and services. The telephone was designed for particular class and race of people.

In this way, the NAC tried to establish a biopolitical demarcation of what the body and mind were allowed and not allowed to do. In doing so, it wanted to prescribe a particular order that suited its goals. In other words, anyone who was not white, American, healthy, wealthy, and preferably male, was a noise factor in the smooth transmission of conversation over the telephone. This view was subtly enforced by the establishment of good use of the telephone by the correct pronunciation of English. The correct use of the English language was a symbol of good manners and good education:

> Speakers have become aware that the human voice is on trial everywhere. Speech itself has thus been advertised in an inescapable way by its newer transmission agencies, and a tremendous impetus has been given to the activities that are promoting better speech … The reason for this is the fundamental one that better speech means better telephone service. A familiar expression of this interest is the educational effort that calls attention to the value of distinct enunciation and explains how telephone facilities can best be used. (Banning, 1930: 76)

Pronunciation and better speech were a perfect way to exclude anyone who was not the ideal telephone user (described above). By establishing any deviation from this 'average' normal as noise, Bell and the NAC could structure the perfect model of bodies and behaviors to which everyone else should adjust. Since there was an abundance of noises, many of which came from media technologies invented by or commercially associated with Bell Labs, it was crucial to construct the notion that these particular noises were necessary for the city, while others deemed as deviant were not. Whereas it proved challenging to train the general populous in the 'correct' way to speak, Bell workers, and specifically its switchboard telephone operators, were easier to train. The training programs that the operators went through in the 1930s and 1940s will be examined here below.

Quieting Noisy Women

This section focuses on the women who worked for Bell during the 1930s and 1940s as switchboard telephone operators,[6] and the training programs the company developed for them to achieve good telephone usage. Focusing on Bell's operators and the training programs they undertook in the 1930s and 1940s, this section shows how standards of behavior were established to produce operators who were efficient objects, part of the machines. Imagining humans and machines as similar systems was inspired by cybernetics, which started to gain more attention at the end of the 1940s. Cybernetics is an approach that takes its name from the Greek word 'kybernân' meaning 'to steer' or 'to govern', which was its main focus: control and communication of animal and machine systems.

Cybernetics' main figures came from Bell, who saw the human nervous system as a machine, and vice versa. As David Tomas argues, the "power of cybernetics' analogical logic resided in the fact that it was able to redefine the concept of 'life' itself in order to bring it in line with *cybernetic* automaton's operational characteristics" (Tomas, 1995: 25, emphasis in original). The idea that the cybernetics put forward was to fuse the boundaries of what was previously considered to be

two separate entities: humans and machines. As this section will show, this idea inspired Bell to create training programs to transform their telephone operators into machines through their bodies, movements, and affect. The transition to the telephone's dial automation, which delegated operators' work to machines, provided an inspiration for the development of cybernetics. The automation of their work, which was led by promoting a design that feeling like 'real-time' will later become a key business strategy to hide decision-making behind processes that produce the distinction between the norm and the deviant.

Connecting Bodies

In the first decades of the telephone, in order to make a connection between subscribers, a manual mediator in the form of a telephone switchboard operator was needed. These positions were first given to boys because they were both cheap labor and bodily adjusted to conduct physically difficult tasks. Being boys, they were thought to be suitable to work with technology. These boys started to work for Bell at the age of 13, but the company quickly discovered that during their work they were rude and pranksters, who did not listen to or obey to their superiors. They would swear over the phone if they were upset, and even threaten to punch customers and cause other bodily injuries. John Carty, who was one of those boys in a telephone office in Boston, confessed in Bell's documentation of those years that:

> They were very poor operators,' he once declared. 'They were not old enough to be talked to like men and they were not young enough to be spanked like children. I shall never forget the noise that was made by those young fellows. (Barrett, 1935: 46)

The first telephone operator was Miss Emma Nutt, who was employed in 1878 by Alexander Graham Bell and opened the way to what would become, by the 1880s, a women's only domain. According to Venus Green, in those years, the service that telephone operators offered helped to preserve social classes, because Bell "presented telephone operators as a group of 'compliant' girls who catered to the subscribers' needs just as a personal servant would" (Green, 1995: 914). As valuable components in the economic growth of Bell, their fine tuning was essential.

The contribution of women to the development of media technologies is barely recognized in historical accounts. For example, Bernhard Siegert (1998), argues that women have been excluded from media histories. Hiring women for

telephone operator positions happened for various reasons; according to Siegert, it was "[b]ecause the frequency range of a woman's voice was more completely encompassed by the frequency band transmitted by the telephone (originally 1,000 to 1,500 hz, after the introduction of the first intermediate amplifier to 2,000 hz, since 1929 to 2,400 hz)" (1998: 87). Therefore, according to Siegert, women's voices were a better utility for the position of the telephone operator. As a German materialist media scholar, Siegert tends to use a 'cold-gaze' when examining media, and neglects to examine other factors.

Michèle Martin, on the other hand, argues that one of the main reasons women were chosen to be operators was that such training was only successful when applied to women and not to the male operators, who rejected it and would not agree to change their behavior. Unlike women, men had other employment options and could just leave and find other jobs relatively easy (unless the color of their skin was also considered deviant). Martin argues that the operators functioned as 'mediating' elements in the making of telephone communication. However, she says that:

> [T]elephone operators were placed in a paradoxical situation: they represented both a necessary element in and an obstacle to the production of instantaneous private interactive communication. Before the adoption of the automatic switchboard, they were essential to making connections between subscribers, but, as 'human mediators' whose activities could delay or intrude on the privacy of telephone calls, they were obstacles to the development of the telephone service sought by the companies. The telephone companies attempted to produce operators with particular habits, skills, and attitudes. (Martin, 1991: 50)

Martin emphasizes privacy as a factor that could be interrupted by the telephone operators; however, every aspect of their behavior could potentially become a noise factor, because they were *part of the communication channel*. Their correct behavior was essential to the smooth and frictionless communication between subscribers. Therefore, their bodies and minds were designed and managed like the rest of the media apparatus invented by Bell. Their femininity, adds Martin, was used by the telephone company to sell the telephone service in what she terms a 'labor of love'. Similarly, in Italy's early telephone days, operators "became objects of sexual desire, but they were also considered women of easy virtue; they seemed to embody the figure of the new emancipated woman but also symbolised the inefficiency of *the manual* compared to the efficiency of *the automatic*" (Balbi, 2013: 71). Just like today, women who worked in technology held the dual position of being progressive and yet not good enough; until men took over their jobs

their work was presented as replaceable (also check Hicks, 2017). It is the labor of affect, the 'sexy-servant' that answers all your needs that made the operators a manual service that was worth more than automatic.

According to Lana Rakow (1988), it was not only the fact that women were more polite and well-mannered that made Bell and other telephone companies across the world hire them—they were also cheap labor. Women operators were thus objects of desire, but at the same time, they were more efficient and desirable economically compared to their male counterparts. Bell wanted to maximize these objects' usefulness by standardizing, moulding, controlling, and managing them according to its needs, just as it did with its inventions. Operators and the telephone were mentioned and treated interchangeably from a very early stage. These women were perceived as part of the telephone's inherent characteristics. As Marvin argues in her examination of electrical communication journals in the late 19th century:

> Much of the romantic poetry featured as light filler in electrical journals meta-phorically identified women with technological objects, both of them properly under male control … Both the women and the telephone were 'inventions' second only to man himself. Sent down to please man, both woman and the telephone were mistaken for toys and turned out to be necessities. (Marvin, 1988: 29)

These women were treated as tools, objects that could be adjusted, modified, tailored, and managed for the sake of better communication and, as a result, for greater profit. During the 1930s and 1940s, Bell developed training programs for its operators, which showed an attempt to enact power and control over every aspect of their lives. These training programs had been an ongoing project since 1900; however, the two decades discussed here represent a deeper intrusion into female operators' bodies and minds both inside *and* outside of the workplace. By doing so, Bell developed and expanded its processed listening capacities to listen to their operators' lives and then shape them in a particular rhythmedia yeilding more value to the company.

Bell's belief in telephone operators as a vital element in its telephone system is shown by its insistence on keeping them as humans elements despite automatic switching devices (also called 'dial') being invented as far back as 1891, by Almon Strowger. The invention was quickly adopted by small independent telephone companies, but only slowly adopted by Bell from the 1920s (John, 2010: 383). By the end of the 1940s, three-quarters of Bell's subscribers were using automatic dial systems but telephone operators were still employed, mainly to maintain a

competitive advantage over the company's rivals (Lipartito, 1994: 1084). Part of this approach was influenced by Bell's disbelief that people could be trusted to use the dial telephone correctly. The automatic switching machine was considered to be a much more complicated system to operate and, therefore, was less reliable, especially in big cities. It also required high skill proficiencies from people to operate it. "Corporate management had long believed that customers were bumbling amateurs; perhaps it was best after all to continue to rely on the expert skills of the trained technician, the operator" (Lipartito, 1994: 1105). Subscribers were more difficult to control, whereas training programs could be deployed directly to discipline the operators, who were treated as the company's own possessions to be re-designed and managed under rigid and intrusive measures.

Designing the Communication Line Model

The training school for operators began in January 1902 and was founded by the management of the Metropolitan Telephone and Telegraph Company (later the New York Telephone Company) and managed by one of the first operators, Miss Katherine Schmitt. The realization that a training regimen needed to be established came after the increased use of the telephone and, consequently, the need for more skilled women who could handle the rhythm of high traffic with efficiency and standardized manner. In the beginning, it was "the 'survival of the fittest'—the operator with the most lung power got things done" (Barrett, 1935: 116). This is mainly because the equipment was heavy and clunky, so the fast movements that the work required demanded incredible physical effort. In addition, as the equipment was at its infancy the operators would also get frequently electrocuted when connecting the chords into the switchboards. Therefore, the physical and mental health of the operators were essential to their acceptance and survival of the job.

After going through physical check-ups that assured their bodies, eyesight, hearing and voice were suitable for the position, these women took voice and pronunciation lessons. From an early stage, operators had to be trained to have a high proficiency of hearing and speaking: "Particular care is taken to impart such training as will result in clear enunciation and accurate hearing; and an ingenious arrangement has recently been produced for developing the hearing of students" (LaChance, 1931: 16). The 'Voice with the Smile', Bell's famous slogan, was acquired through strict body adjustments, which included shaping "the use of the tongue, lips, jaws, and posture that would result in proper pronunciation and a tone of eager friendliness" (Cooper, 1997: 492). Designing the perfect voice was

important because it was the interface between subscribers and the telephone and was meant to provide a pleasing and frictionless experience. Therefore, to ensure an efficient transmission, it had to be clear, concise and embody the 'tone of service'. In this way, Bell shaped and managed women's bodies, voices and movements towards a rhythm that produced efficiency and at the same time labor of care and emotion. Such rhythmedia consequently led to more profit.

In the training schools, after a short explanation on the functionality of the switchboard, operators were put to work 'learning by doing', familiarizing themselves with the atmosphere of 'real-time' work. Managing and monitoring operators' actions were tasks carried out by their supervisors but also by the operators themselves. Moreover, there was a deportment card to report the transgressions of operators, who were not allowed to cross their legs, and had to ask permission to blow their noses or wipe their brows. According to Kenneth Lipartito:

> [T]elephone companies encouraged operators to fill 'scrapbooks' with material bearing on accuracy in work and personal improvement, awarding prizes for the best efforts. The purpose of such policies was to create workers willing to perform their tasks hour in, hour out and to cooperate with their machines as well as their fellow workers. As Katherine Schmitt, Bell's first female supervisor, succinctly remarked, 'the operator must be a paragon of perfection, a kind of human machine'. (Lipartito, 1994: 1088)

Through various body training, psychological manipulations and financial incentives operators were under constant process of being produced as machinic subjects. Inspired by Frederick Taylor's scientific management approach, Bell broke down the operating service into distinct repetitive stages. It aimed to reassemble and standardize the movements to produce the optimized operator, while putting strong emphasis on repetitive sequence speed. But the company also wanted to reduce the anger of subscribers who were promised and therefore expected a fast and reliable communication device. Bell wanted to produce operators' behavior into a machine rhythm, to save time and, consequently, money. Breaking and dividing their work into many elements facilitated a reordering of the ways they talked and operated the apparatus. These operations were called 'drills':

> To augment the learning and skill obtained through controlled practice, particular emphasis is placed on those phases of operating where the necessary speed and proper techniques can be acquired only by constant repetition. These

> repetitions are called 'drills,' and permit the operator to concentrate on a partic-
> ular operating feature and develop the dexterity desired. Throughout the training
> period, drills are scheduled on such procedures as the location of subscriber line
> numbers in multiple banks, use of keysets or dials, becoming familiar with route
> and rate information on reference bulletins, and similar items. (Clark, 1950,
> p. 125)

After conducting processed listening by monitoring operators' movements, Bell
categorized what were the ones which harmed the system as noise. This knowl-
edge then was fed into training programs which focused on repetitive movements
to reorganized their bodies in a rhythmedia that was economically beneficial to
the company. As Jill Cooper argues, the simplest sequence of movements of tele-
phone connection required at least 11 separate processes to be performed by the
operator. She adds that the "ever-present supervisors timed and monitored the
speed, politeness, and accuracy with which operators completed calls" (Cooper,
1997: 495). In this way, both operators' engineering skills and affective labor
were constantly measured and categorized to then re-ordered through repetitive
movements for a better service. So although the operators' work was physically
and emotionally damaging, "[e]fficiency records were kept for each operator and
were reflected in her pay" (Ibid). According to Stephen Norwood (1990), slow
reactions, disconnections, or unanswered calls were followed by punishments,
such as lower salaries, unattractive shifts, or suspension from work. Norwood
observes that:

> Management believed scrutiny of the operator's performance to be 'analogous to
> the inspection of the product of the factory, telephone service being the product
> in our case.' Engineers responsible for methods and standards devised operating
> rules and techniques 'to give the best possible service with maximum efficiency
> … under all conditions.' To determine 'proper standards' for operators' work
> load—that is, the number of calls an operator was to handle each hour—the
> engineers used stop watches to time each step of a call 'to the exact second'.
> (Norwood, 1990: 36)

Bell engineers developed statistical measures to establish behavioral norms for
operators to obey. Technological improvements to the switchboard meant that
less effort had to be made to complete each call; however, it also increased the
work pace expected from the operators (Lipartito, 1994: 1100). Bell's operators
were expected to answer or disconnect calls within a 3.5-second average (Green,
1995: 933). Thus, statistics opened new opportunities to govern and manage
operators in the name of efficiency and profit. Bell's **measurements** of operators'

motions were designed to construct the most (cost-) efficient norm, but they simultaneously established what were the irregular, deviant, and anomalous behaviors. Noise, in this sense, took the form of physical malfunction: fatigue, injuries, or mental instability. German operators, who were employed by the Reichspostministerium (RPM), also experienced ailments and exhaustion from the fast tempo of their work:

> Medical and industrial experts, physiologists, and experimental psychologists weighed in on the subject of the so-called Fräulein von Amt, examining the effects of switchboard work on her body, senses, and psyche and exploring her sexual behavior, her attitudes toward marriage, and her leisure activities. Operators became emblematic figures of the German discourse on technological modernity and its discontents. (Killen, 2006: 163)

Like their American counterparts, German operators went through medical examinations where their bodies and performance were listened to and measured statistically. While the training programs intruded their bodies and minds, the job they conducted enabled them to earn their own money and independence. This new configuration, then, threatened the morality of society, or more precisely—of the men who governed it. During the second decade of the 20th century, scientific management, Taylorism, and Fordism were imported from the United States, along with strict surveillance and discipline methods deployed on the operators' service, workspace, speed, and time.

The connection between Bell and the RPM was the German psychologist Hugo Münsterberg, who developed tests inspired by Taylor for both companies. Münsterberg used operators to examine adaptation problems to the new rhythms of the workplace to maximize performance (Killen, 2006: 194). Psychotechnician Fritz Giese refined Taylor and Münsterberg's approaches by asserting that German work science "should augment them with a concern for the 'whole person,' body and mind" (Killen, 2006: 198). In 1919, the RPM invited Giese to examine its employees, as he was particularly interested in the operators' free time such as daydreaming, sexual stimuli, film-going and 'moral character'. He analyzed operators along with **measurements** of their attitudes, response times and attention, and produced regularity curves. According to Killen, Giese divided operators' work into almost 20 different procedures of switchboard work:

> Each element engaged a different combination of the operator's mental and sensory faculties: hearing, vision, attention, and memory. Giese calculated the time necessary to perform these tasks and the psychophysical profile associated with

each. Out of these calculations he created norms for selecting candidates and for improving the efficiency of those already employed. (Killen, 2006: 196–7)

Operators' body rhythms both inside *and* outside the workplace were tuned and accelerated according to Bell's needs. Conceiving operators' bodies as thermodynamic systems, Giese designed fitness programs, or, as he called it, 'Taylorization of the body', which strengthened operators' bodies and, consequently, optimized them. These physical training programs, which were a fusion of Taylorism and gymnastics, as Killen argues, were meant to **train operators' bodies** to the new rhythm of the workplace. Although Killen argues that Giese designed special training programs, these are not discussed and his operation did not last past the end of the 1920s. Nevertheless, it is significant to show how ideas about training operators and even cybernetics preceded Bell's venture in Germany.

Personal Immediacy

The financial crisis following the 1929 stock market crash, as mentioned above, had huge consequences for Bell. Along with creating new consultancy services for noise reduction, one of the company's responses was to emphasize the service aspect of its business, attempting to make it as pleasing as possible. At the same time, as Green argues, to save money, Bell conducted several measures such as increasing the workloads of operators and employing former operators on a part-time basis, which enabled the company to save on training new ones and increase productivity due their experience with high-traffic work. But it also helped Bell to disguise the fact that it wanted to slowly move to automatic dial machines, and the crisis helped it in rationalizing workforce reductions. As Green observes:

> After 1929, however, the rate of dial conversions continued, but the number of traffic employees declined. Between 1929 and 1939, more than 60,000 Bell System traffic employees lost their jobs, while the percentage of dial conversions more than doubled from 26.6 percent to 55.7 percent. As conversions stabilized and the nation economy recovered slightly, operating forces temporarily increased in 1937. When dial conversions accelerated during the 1937–38 recession, the number of operators fell again. Regardless of Bell System attestations to the contrary, the purpose and the effect of the dial conversion eliminated operators. (Green, 2001: 161)

Green argues that the conversion to dial was opposed by subscribers, congress and labor organizations, which led US Secretary of Labor William N. Doak to

establish a committee to investigate unemployment caused by technology in August 1931. Since Bell operated as a public utility, it was under more public criticism regarding its employment and economic practices. Bell distorted several facts about its employment practices, as it did not say that it saved money by not paying for extra hours, by cutting many jobs down to part time and downgrading many employers' positions and salaries, as well as withholding job promotion.

After the Depression, argues Green, Bell clung to the notion that the technological displacement introduced by the dial was a natural progress. Such progress could be justified by the expense of the low-paying jobs of the operators compared to their male counterparts who worked for Bell. Men's jobs were mostly kept and management was more willing to hear their union's demands. Despite dial conversion, men's work was untouched because they could be re-trained. This was one of the first occasions of tensions and struggles around automation of work, and the way big media companies exploit their workers to then replace them by machines. It shows the gendered politics of whose rhythm can be made redundant and removed from the system.

Only in the mid-1930s did the situation improve, with increasing subscribers and company revenues. However, when WW2 broke out in 1939, the opposite situation occurred: there was high demand but the company could not support all of the requests, which resulted in many angry customers. Therefore, Bell's strategic moves were meant to expand its ability to make a profit from its staff and equipment and shape its position as a necessary service for all ranks of society.

Another reason for the transition in the approach of Bell from the 1930s to the 1940s came after the company had realized that it needed to increase sales, which consequently led to it investing in the development of more types of service. According to Hanson (1983), during the 1920s and 1930s, most of Bell Laboratories' "work was focused on designing better telephone sets by considering the physical dimensions of customers' heads and hands and on understanding the properties of the human ear and voice so that electrical transducers and circuits could be improved. It was in this second era, known as psychoacoustics, that behavioral science was formally instituted at Bell Laboratories" (Hanson, 1983: 1573).

This second era that Hanson mentions was the 1940s, when customers' needs started to be at the core of Bell's concerns. Hanson argues that another path, in what he phrases 'human factors', arose from the needs and qualifications of the employees, which brought the 'pure' behavioral research into the organization along with practical activities. Thus, Bell started to employ experimental

psychologists, such as Walter A. Shewhart[7] and John E. Karlin,[8] who formed the User Preferences Research department in the mid-1940s.

As a consequence of this approach, during the 1940s, Bell started to dedicate more resources to various training programs for better telephone service. This was mainly because the company felt that the technical aspect of the telephone device had reached a stage where only minor improvements could be made:

> The marked improvement in the technical phases of telephone service during the past ten years has left less room for improvements in this field than there has been in the past. While further technical advances will continue to be made, the greatest immediate opportunity for service betterment lies in the broad field of making the service more pleasing and more personal for the customer. (Prescott, 1940: 95)

This user experience approach also brought the notion that, if Bell wanted to sell the telephone service, it must be enjoyable, gratifying, and attractive. This could be achieved by the operators, who could fulfill all these criteria, using them as an instrument of communication, a pleasing (selling) machine. This approach can clearly be seen in Bell's journal article titled, 'We don't like to say "No"':

> It was early in 1941 that the telephone companies first began to consider the possible effect upon business office service of having nothing to sell. It came up in connection with a program of conservation of telephone facilities and materials which the Bell System undertook voluntarily when the possibility of war focussed attention upon national defence. This program called for a change from the Bell System's traditional sales policy of promoting the use of the many items of telephone service through discussion with customers of their use and value. (Ord, 1944: 104)

Operators were, therefore, not only part of the communication channel; they had a very particular and calculated position within the communication channel—to increase Bell's sales. Telephone subscribers were meant to have a frictionless experience of reaching whomever they wanted in 'real-time', and getting the impression they would get whatever they wanted. This was the reason why the women who worked for Bell had to be attractive, young and unmarried, and why Bell had very strict policies regarding the way the women should look. Since telephone customers would not actually see the telephone operators, their appearance or marital state should not have mattered at all. However, Bell used the operators'

good looks as a promotional tool, bragging about operators who have found their husband by being their operator. This would increase the desirability of the telephone, which embodied these women.

Personalization of the telephone service had been a common practice since Bell's early years, intended to change the bad impression left by the boy operators. After a few decades, when the service became more popular, the personalized care that the operators provided could no longer hold due to the number of people. Nevertheless, it was portrayed as a positive evolution that made the service much better:

> [T]he de-personalization of telephone service, from the standpoint of the individual operator's acquaintance with the individual subscriber, has led to a service that, in the overall sense, is more personal than ever before. For the very reason that the operator does not know subscribers personally, she treats them all as if she were at their personal service. Just because she cannot, in a vast majority of cases, know how important a particular call may be, she handles every call as if it were urgent—as courteously, as promptly and as accurately as she knows how. (Barrett, 1935: 288)

The re-introduction of this approach in the 1940s emphasized personal and friendly service. Operators were expected to behave 'naturally' and spontaneously, and give answers to situations that one might not foresee. The voice's tones had to sound authentic as if conducted in a face-to-face conversation with a friend. "Unnatural voice habits are avoided, such as mechanical voice tones, extreme rising inflection, exaggeratedly sweet tone, precise diction, and other voice mannerism which may be distracting or displeasing to the customer" (Prescott, 1940: 92). Although the operators were encouraged and trained to act like machines, they still had to emphasize their competitive edge by using their affective 'human-feminine' labor to make people feel like they are getting a pleasing personal service.

The 'tone of the voice' became a program for new operators to become friendlier, attentive and pleasing. "When a girl speaks too fast or too slowly, speaks either indistinctly or with unusual accent or inflection, or has a voice with extremes in pitch, efforts are made to assist her to conform more closely to tone-of-service objectives and yet retain as many of the individual pleasing qualities of her voice as possible" (Clark, 1950: 129). Here Bell wanted to shape both operators' mechanical skills along with their 'pleasing qualities' while erasing their individual malfunctions such as race, class or health. Overly polite speech that was highly emphasized before the Depression was no longer encouraged, and operators were

told that excess use of words such as *please* and *thank you* gave the impression of a formulaic routine, and must be avoided. Specifically:

> Simply having the desire to render a pleasing and personal service is not enough. Activities directed specifically toward developing the right viewpoint include: Increased emphasis in training programs on the principles of pleasing tone, voice, and manner; Having groups of supervisory employees listen in simultaneously on operators' work, after which all members of the group discuss what has been heard, and reach a common understanding in regard to their individual appraisals of the service, tone, and manner; Encouraging all levels of management to use every opportunity to observe the service, tone and manner, followed by a discussion with the force of what was observed … Employment of all contacts between supervisory force and employees in the day-to-day work for creating the proper viewpoint in regard to personalized service. (Prescott, 1940: 90)

Women's bodies, behaviors, and voices were under scrutinized control and inspection. They were constantly monitored and observed by their supervisors and peers to achieve what Bell considered the perfect pleasing service. Bell merged Foucault's discipline and biopower modes of governmentality by using elements of direct discipline as well as self-regulation and observation deployed on themselves and their fellow operators. An example of this hybrid bio-discipline was *Hear Yourself as Others Hear You*, a program designed for operators to listen to other operators while they were working, and evaluate their service skills from a subscriber's point of view (Prescott, 1940: 90). Here again, listening abilities were given to operators to **train their bodies** towards a more efficient service and discipline each other. Power was enacted by establishing the norm of operators' behavior, while punishing those who deviated from it.

The Human Information Processors

During the 1940s, Bell started to offer a service called the *Information Service*, which was designed to help subscribers find the telephone numbers of places or people they did not know. The information operator would help housewives to find the numbers of grocery stores, young men who were searching for a woman they had encountered at a party the night before, requests for ambulances and also "requests for telephone numbers from salesmen, professional men, and business executives who find the services of the information operator invaluable in their day to day telephone communications with their customers and associates" (Baurenfeind, 1941: 151). These women were expected to find answers in the

form of telephone numbers for various problems and questions people had, in less than half a minute, a precursor to web search engines. According to Baurenfeind (1941), the information operator managed to find the desired numbers nine times out of ten. The main objective was clear: "giving and obtaining complete and accurate information over the telephone and taking advantage of sales opportunities [to] increase the value of the service—which in turn results in its more extended use" (Hoy, 1947: 75). In this way, operators memory functioned as an archive which can be monetized for various purposes.

Another service was the *Intercepting Operator*, who was responsible for monitoring misdirected calls, or calls to telephone numbers that were no longer in service. This operator would interrupt the call and ask the caller 'What number are you calling, please?' Then she asked, 'Will you make your call again, please?', so that the customer could reach the destination.

> She knows also the number of pieces of equipment in each channel which can be safely "busied out" for maintenance testing without affecting service, and when this number is reached, she takes action to have some of the normal "checking up" by the plant forces postponed so that the highways of speech may be kept clear for all to use. (Bauhan and Goudy, 1942: 130)

In other words, intercepting operators had to learn how the telephone apparatus and infrastructure worked, and act according to previous situations to reach equilibrium in the most efficient way, just as cybernetics viewed automatic machines. Bell's treatment of women as informational processors, part of its media technologies, who facilitated the system *and* were assimilated into it, was a precursor to the key concept of cybernetics—feedback. According to Norbert Wiener, feedback is "the property of being able to adjust future conduct by past performance" (Wiener, 1950: 32). Operators embodied the feedback loop because of their function of maintaining the telephone system's equilibrium by providing technical support, and a soothing emotional mechanism. They received limited and controlled listening abilities to gain knowledge about past apparatus malfunctions and subscribers' complaints, which could improve future functions (with their function of their memory) and orderings of the service. When the operators did not have the correct or accurate knowledge, their feedback did not operate properly, which increased undesirable uncertainty (entropy) in the system; in other words, they became a noise source.

John Pierce argues that "cybernetics has laid claim to the whole field of automata or complex machines, including telephone switching systems, which have been in existence for many years, and electronic computers, which have been

with us only since World War II" (Pierce, 1980: 227). Operators' functions, which were difficult to use efficiently and simultaneously by machines, were later delegated to automated silent systems. Operators conducted multiple actions simultaneously: determining the calling number; answering calls in the voice with the smile; soothing angry subscribers; distinguishing, deciding and **filtering** between noise on the line and a signal (decoding); determining the connection wanted by the subscriber (translation between human and machine languages); writing a ticket for billing; remembering what to do in various situations (storage and memory); detecting malfunctions by sliding between the system's multiple layers, reporting and fixing the apparatus; and adjusting performance according to previous situations (by using their dynamic archive which is their memory). Therefore, operators embodied several key features of cybernetics that Pierce outlines: detection, s(m)oothing, **filtering**, prediction of future signals in the presence of noise, storage, and memory (Shannon, 1951).

Bell's optimization of the human nervous system, in the shape of training programs for operators, then, served as an inspiration for cybernetics. Specifically, operators gave inspiration to the process of making media technologies more automated, multi-layered and yet with an interface that conceals the multiplicities of actors and channels involved to create a 'real-time' experience to 'normal' users. Operators' work of tuning in an out of spaces gave inspiration to the design of media technologies that listen to people's behaviors and produce a dynamic database that could make the service more efficient and economically successful.

A Design for Living

The Second World War brought various governmental restrictions over telephone usage, interfering with Bell's economic aspirations. The War Production Board orders L–20 and its successor Utilities Order U–2 meant that there were disruptions in the regular telephone service. Subscribers were irritated and annoyed by these disruptions, and Bell felt it had to do everything in its power to maintain customers' faith, loyalty, and trust. According to Green:

> In the years immediately following World War II, the rush to fill backlogged orders, the end of over-time, the five-day work, large numbers of resignations, and continued growth contributed to the rapid increase in operators. Dial conversions, which had practically halted during the war, increased slowly in the years immediately afterwards. From 1948 to 1950, when conversions resumed a more rapid pace, the number of operators decreased. (Green, 2001: 162)

Since Bell's operators were considered a pleasing (selling) machine, they were also expected to satisfy the country. They were expected to work for free during war time. Framing it as 'volunteering', women who worked for Bell worked not only in Bell's positions, but also for other governmental agencies: "The telephone company was asked if one hundred girls would volunteer from the clerical forces to assist on their own time. They would indeed. Five hundred volunteers! … and a pleased government official said 'Isn't that just typical of the telephone girls'" (Fawcett, 1943: 47). Operators were designed to increase Bell's sales and stabilize the brand's name and apparatus.

But to provide good service, their bodies needed to be in the best functioning condition. AT&T, the umbrella company of Bell, was extremely concerned with their workers' bodies, and was one of the first corporations to establish a medical department. This department was founded in 1913, and embodied "ambivalent if not conflicting goals, including a desire to mold a compliant and efficient labor force while simultaneously protecting workers' health and safety" (Cooper, 1997: 490). However, in biopolitics rationale—enacting power over a population by using techniques of intervening in, and managing bodies—these goals are complementary, not conflicting. According to Cooper, this department helped save AT&T money by providing preventive medical advices and showing the company cared for its female workers, and thus justifying its position as a telecommunications monopoly.

As mentioned above, due to their stressful work conditions, operators suffered from noise to their body such as anxiety, fainting, fatigue, nervous exhaustion, headaches, backaches, and strains in their arms, ears, and eyes. To correct some of these health defects, which Bell blamed on the operators, a training course called *The Health Talk* was developed during the 1920s and was standardized during the 1930s at all the company's training schools (Cooper, 1997: 492). As essential components of its communication apparatus, Bell could not afford to have damaged products.

The politics of life, or biopolitics, went a step further when it came to the intrusion into operators' bodies and leisure time. Bell women took part in health activities invented by the company in 1925, then called the *General Health Course for Women* and in 1943 transformed into *Health-Appearance-Personality*. This program provided instructions on how operators should take care of themselves and others through nutrition, exercise and hygiene. Operators' eating habits and diet were also a target for Bell to intrude and regulate. They had to go through another training course called *Food Makes a Difference*, which taught them good nutrition and fitness appropriate for war time (Fawcett,

1943: 40–1). In this way, Bell redrew the boundaries of the operators' bodies, listening to every movement, food consumed, and health condition so that it could gather as much data as possible. As Bell collected this data they were able to reconfigure the operators bodies with training of their body's health and nutrition to operate in the correct rhythms.

This increased intrusion into operators' ways of living can be illustrated in one of the flagship training programs developed by Dr. Theresa Boden, *A Design for Living*. According to Boden, 11,000 women had completed this program between 1939 and 1941, which then stopped during 1942 to 1945 so that "telephone women temporarily set aside their personal goals to give their free time and effort to the many war activities of those years" (Boden, 1948: 152). When the program restarted in 1945, the name *A Design for Living* was selected, and by 1948 more than 400,000 women were reported to have completed the program. The program was described as follows:

> Health is not merely the absence of illness. Body, mind, and spirit form the whole being, and to be healthy, a person must be happy. To be happy, an individual needs some variety of interests, and it is toward discovering these that the Design for Living program is directed. Through Design for Living may be developed a more nearly self-sufficient person, free from the frustrations and emotional imbalances which, we recognize today, contribute seriously to many illnesses. We in the medical field believe that personnel activities such as Miss Boden describes are an integral and important part of a program of preventive medicine which should be our greatest contribution to the business. (Boden, 1948: 148)

As this description outlines, 'health' encompassed every aspect of a worker's life—body, mind, and soul – to be happy. The program started in a meeting in 1939, where the Personal Relations Department of AT&T in New York wanted to provide an answer to what it described as requests from telephone women workers for a better use of their leisure time and their individual potential. The department felt that the best thing would be to enable these women to reach "means for discovering for themselves their real needs and interests—a continuing plan for individual self-development" (Boden, 1948: 151). The slogans that accompanied the program were hung in Bell's offices, saying *What Do You Do with Your Time?* and *Do You Have A Design For Living?*.

According to Bell, this program gave "proof of the variety of interests and needs of the women who … have found through *A Design for Living* new meanings to life" (Boden, 1948: 153). None of these 'meanings' and 'needs' included higher

pay, stability at work, benefits or promotion, but rather what Bell needed from the operators. Thus, operators' bodies were not the final destination of intervention; their minds, habits and preferences inside *and* outside work were also a source of knowledge. This knowledge could then be harnessed for other interventions, and reconfiguring of their work, bodies, minds and apparatus. The more spaces Bell could listen to, the more it could know the operators and adjust their behaviors accordingly.

The program consisted of 10 weekly meetings of groups of 10 to 12 women, who would sit around a table and talk about their individual potential, while the discussion was led by a group leader. The program covered ten topics: conversation ('the art of making others feel "at home" with you'), speech ('how to say what you mean; the importance of choosing the right words'), reading, dress and grooming ('how to look your loveliest'), etiquette ('answers to your questions on the social rules'), entertaining ('how to be the perfect hostess; planning parties'), home decoration, managing the family's money ('managing your money—so you don't spend more than you earn'), travel and hobbies ('when to go and what to do with your holiday weeks and week-ends') (Boden, 1948: 151). As these topics illustrate, Bell wanted to know, control and manage its operators' bodies and minds inside *and* outside the work space, stretching its listening capacities to reach every aspect of their lives, to re-design it. This then enabled them to orchestrate the rhythms of their lives.

The topic of 'entertaining' meant organizing social events for soldiers, where the women were the main attraction. Operators had to function as hostesses and dance partners at parties Bell sponsored and the women organized. In addition, operators organized picnics for soldiers, prepared the food and provided services of companionship and romantic partners:

> A park was selected for the picnic, the day and the time were named, and the young women were on hand to meet the boys, each with an attractively packed box lunch for two. Each man drew for a box and with it went, as partner for the day, the girl who had packed it. The telephone woman who acted as chaperone said that she had no difficulty getting the party started, but she certainly had a hard time getting the boys headed back to the post on time—they were having such a good time. (Fawcett, 1943: 49)

Bell saw this branded self of women with the company as the *Spirit of Service*, which it saw as traditional and contagious: "it doesn't take long as a rule for one of the operators, a 'First Lady of Communications,' to 'sell' the idea of working for 'her' company to others. Often these newcomers land at a switchboard,

sometimes at another kind of work" (Steelman, 1946: 139). 'Spirit' seemed to have had a wide meaning, which included control over operators' bodies, minds and time, while selling all those components as part of the service. Importantly, the goal was to bring 'happiness' and 'self-fulfilment', which would prevent frustration that led to conflicts, especially those that were led by the operators' unions.

Silencing Dissent

The attempts to penetrate into operators' private lives were a way for Bell to circumvent protest and 'militancy' (Green, 1995: 943), unwanted forms of behavior that created disruption to its system; a noise source. Forms of organization and protest from Bell operators started as early as 1907 in San Francisco. In 1919, New England Bell operators organized a walkout, fighting for wage increases, which signalled to the company that it should address what they considered to be dangerous activities (Cooper, 1997: 502). As personnel expert Ordway Tead argued, "it was in management's best interests to try to control informal organization among employees and to reorient their thinking along more 'constructive' lines" (Cooper, 1997: 502). It is precisely 'reorientation' that the *Design for Living* program was meant to do—rearrange operators' rebellious actions into the correct order. Bell developed training programs for its operators as a noise reduction mechanism, a conversion to the correct behavior.

One of the solutions Bell found to be useful against the operators' revolt was counselling. Popular workers were selected to be counsellors but the position itself did not require professional training, because the real purpose was not to solve mental or emotional problems. Rather, the counsellors were supposed to reduce distortions in their obedience and channel attitudes towards 'productive' directions. These counsellor-operators functioned as feedback loops to stabilize noisy disturbances. Over half a million counselling meetings occurred at Bell between 1936 and 1955 (Cooper, 1997: 503). Through both *Hear Yourself as Others Hear You* and counselling, Bell expanded the listening capacities of the operators to empower them to know their peers within and outside work, and also to train and educate them in cases when they deviated from the right way. Creating a database about what operators do and think was not only a site of interest and control for Bell but was also given in lesser capacities and in more controlled manners to the operators.

However, the shared experience made in *A Design for Life* also contributed to a group identity that could turn towards organization and unionization, leading to the nationwide telephone strike in 1947, led by the National Federation of Telephone Workers (NFTW):

Women telephone workers and the organizations they built were the backbone of the 1947 nationwide telephone strike … With 350,000 employees on strike, 230,000 of them women, the 1947 telephone strike was the largest walkout of women in U.S history. Carrying signs that proclaimed 'The Voice with a Smile Will be Gone for A while,' around-the-clock pickets paraded throughout the South, the Midwest, and in rural towns across America. (Cobble, 2005: 21)

According to Dorothy Cobble, 12,000 women who worked as operators in New Jersey left their positions, which was against the law, and were jailed and given high fines as a result. These women demanded equal pay and other rights in the workplace that they had been deprived of during the Second World War, and they had expected these conditions to improve once the war ended. Cobble argues that the NFTW failed to reach a national contract and that regional settlements were made with regard to the economic demands of the telephone operators. Therefore, the development of *A Design for Living*, along with its attempt to shape, control, and manage the operators, also served as a surveillance mechanism to eavesdrop on their leisure time.

Trying to control what operators did outside their working hours was a way for Bell to prevent any kind of activities or gatherings that involved union organization or discussions around their rights and work conditions. As one Bell Labs medical specialist argued: "[p]eople with interests seldom have time to be frustrated" (Boden, 1948: 161). Thus, the development of *A Design for Living*, along with its counselling treatments, contributed to the surveillance and biopolitical management of unwanted—noisy—behavior. At the same time, it could counter Bell's goals by helping to establish communication and collective action among the women. As Lipartito argues when talking about the telephone strikes in 1917:

The sudden expression of independence among the operators unsettled Bell management. As one member of the corporation observed, unions instilled in operators a 'lack of respect for authority' and resulted in 'independence of action by the individual' … Both recognized that the same order and purpose that made for efficient switching could be turned against the company. Because manual switching required machine-like discipline, independence of mind endangered the entire telephone network. (Lipartito, 1994: 1108)

Cybernetics' aim to achieve equilibrium was inspired by Bell's interpretation of the term; which meant efficient transmission of information in the minimum time, and at the minimum of expense and disturbance. Since this stabilization was interrupted by the operators' constant rebellious actions, Bell realized that their positions should be delegated to machines. Thus, control and power were

to be enacted on the population through more automatic technologies; the right way to behave with the apparatus was integrated, automated and delegated to the company's devices, while presented as the only way of usage. As Wiener, argues:

> A recent innovation in the technique of telephonic switching provides an interesting mechanical analogy to man's adaptive faculty. Throughout the telephone industry, automatic switching is rapidly completing its victory over manual switching, and it may seem to us that the existing forms of automatic switching constitute a nearly perfect process. (Wiener, 1950: 59)

This victory of the male adaptation ability shows how it was achieved by disciplining and managing women and then driving them out of the workforce. Their noise became silenced by automatic machines, whereby the technique of governing (cybernetics) was in-built, not supplemented.

Conclusion: Noise Against the Machine

This chapter examined the way media practitioners (re)produced people and territories by using sonic epistemological practices in the two decades before Claude Shannon's information theory. In the first event, Bell was given a **license** by the NAC to scientifically measure NYC and processed listen to multiple spaces across the city to provide a numerical map of the noisy places. **Measurement** was carried out using two devices developed by Bell, and these could only be operated by its **experts**. Both devices required Bell experts to learn, operate and interpret the sounds they listened to.

As scientific **measurements** were perceived to be objective, the knowledge Bell produced with its devices and quantitative units could be used for various rhythmedia strategies. This database could be monetized and traded for various other services. Moreover, promoting Bell's involvement with the NAC, including the decibel and telephone numbers across multiple media outlets established Bell as the main authority of sound and noise. Bell gained the **license** to be the exclusive knowledge producer, and its terminology and importantly world order was credentialized as the main way to think and understand ways of living. By measuring the city with Bell's tools and unit, people and territories were reproduced according to the company's classifications of sound (normal/healthy) and noise (abnormal/sick).

In order to be healthy, people needed to **train their bodies** in several ways to be quiet. First, people were educated on how to describe different behaviors

using decibels. In this way Bell promoted its rationale of how behaviors could be categorized, described and understood and make it the standard. Second, people were trained to behave in ways that would not create noise and consequently burden the city's infrastructure with their unlicensed commerce practices and uncivilised behavior. Specific groups of people were the target of the NAC and Bell, mainly street pushcart sellers who were usually foreigners from Europe and Black Americans in Harlem. Third, people would be encouraged to educate their peers into the correct way of behaving, thus helping the municipality's authorities in changing and monitoring the noisy actions of problematic people. In this way, the NAC and Bell's interpretations of what a healthy citizen's body should sound like, how it should behave, when and where, were (re)produced.

The healthy body was reproduced with Bell's measuring unit, its own language of describing spaces, humans and their relations. These orchestrations of people's bodies, how they interact with each other, how they move across the city, and when was a way to create a new order. These reproductions were not coincidental; they were calculated and correlated with other economic interests that fitted Bell and the other interest groups that collaborated with the NAC. Their main aim was to conduct rhythmedia that reconfigured the way people behaved and also how the city should be reordered towards specific economic endeavours. Any behavior, group of people or areas that would interfere with such aspirations because of their problematic commercial/advertising practices, political activities, racial difference or other disturbances would be categorized as noise.

In the second event, Bell's operators undertook **training** programs to optimize their bodies and minds to make the telephone service more efficient and economically profitable. The 1929 stock market crash that led to The Great Depression, along with the Second World War, made Bell realize the many uncertain conditions that could affect its business. This led the company to adjust its strategies to exert control and power over the things it owned, such as the telephone and the operators. Noise was any unwanted form of behavior in its systems that had to be controlled and managed in order to create a frictionless operation. The power the company held in the communications market of North America gave it the **license** and ability to make such far-reaching intrusions into its telephone operators' bodies, minds and leisure time.

Operators had to manually facilitate the switchboards, understand the infrastructure like engineers and fix problems in 'real-time' but at the same time sooth angry subscribers with their affect and therefore held multiple positions. These positions are: the communication channel, filters of human and non-human

noise and the feedback by adjusting future conduct according to past knowledge (with their memory/archive). Operators' work is repetitive and conducted continuously, to create the illusion of immediacy and real-time experience, while shaping what is sociality.

In the *Design for Living* program, operators were trained to exercise, take care of their body hygiene, and have special diets; they were given advice on what to read, what do in their spare time and how to manage their money. Every aspect/space of their lives was listened to, to know everything about them. This was then used to reorder their lives in a desired rhythm. However, Bell also gave the operators controlled and limited listening capacities to **de-politicize** their actions. First, the company gave operators the ability to listen to their peers in the *Hear Yourself as Others Hear* you programme. This was done in order to monitor and police their interactions with Bell's subscribers. Second, the *Design for Living* program was meant to provide group discussions in which the operators would talk about their leisure activities, and were given plans on how to conduct various aspects of their private lives. As these programs were conducted after work hours, this was also a way to monitor and spy on what they did outside work. Third, Bell delegated some listening capacities to selected 'likable' operators who functioned as counsellors to decrease the noise of the rebellious operators who were part of the unions that were forming across the country. In these ways, Bell provided controlled listening capacities to operators to deploy in certain spaces and then the 'uncrowded' their rhythms both inside and outside work.

All of these training programs and the development of the operators' work were an inspiration for cybernetics, which aimed to control the communication systems that constructed information's correct behavior, and, consequently, people. Bell enmeshed biopower with its disciplinary Taylorist approach and created a hybrid. This mixed mode of governmentality was enacted to control telephone operators' behavior and attitudes within *and* outside the workplace. It stretched the scope of discipline beyond specific architectures such as the work place and penetrated new territories of life.

Both the conceptualization of 'bad' human behavior as noise, and the recognition of humans and machines as components of a communication system in Bell's treatment of its operators, would provide the basis for the replacement of human operators by dial switching. Instead of employing and managing noisy operators, Bell could swap them with automatic machines that could achieve equilibrium through self-governing feedback loops. Thus, Bell enacted its power through an in-built, silent, controlled design, and by doing so decreased both people's ability to disrupt its inventions and the uncertainty of its systems.

This also sets the foundation for Shannon and Weaver's conceptualization of noise, which they developed at Bell Labs in the late 1940s. In information theory, they established and legitimized which forms of information should be categorized as statistical irregularities—noise—and which should be classified as a (normal) message. This, in turn, would lead to the development of cybernetics, as control over systems of communications (animal or machine) would be delegated to automatic multi-layered machines operating in a feedback loop. These technologies were designed in a specific way to efficiently govern through statistical measures that constructed the right behavior of information and, consequently, the people who used them. However, their interfaces and designs conceal the multi-layer channels at the back-end, and especially the decision-making processes that are involved in the process.

This means that technologies are never neutral or objective. Media companies' values which often discriminate along lines of gender (Hicks, 2017), race (also see Benjamin, 2019 and Noble, 2018), socio-economic situation (Eubanks, 2017), and ability (Hamraie, 2017), are shaping the way these technologies are developed and created. These, in turn, influence the way people engage and understand these media technologies, including how to behave and not behave, how and if people can protest and what values they should care about. In this way, the categorization practices of media companies around specific behaviors as deviant has further political, social, and cultural repercussions.

This introduced the next phase in the evolution of biopolitics as a new form of governance which was more automated and hid multiplicities of actors and communication channels. Therefore, this was also a development of the power relation scope and the way it was operated: controlling, governing and managing people through new extensions and techniques afforded by automated, media technologies.

Notes

1. The NAC produced two reports (Bijesterveld, 2008: 116): the first that is examined here was published in 1930, and the second was published in 1932 in a limited edition, but will not be examined in this thesis.
2. Johns-Manville Corporation was founded in 1858 in New York and manufactured insulation, acoustical and magnesia products. In 29 January 1930, the company's stock was included in the Dow Jones Industrial Average.
3. International Committee on Acoustics.
4. The sensory system used for smell.

5. 1924 saw the Immigration Act, which limited the numbers of immigrants that could enter America.
6. For convenience, they will be termed 'operators' from now on.
7. Walter A. Shewhart invented control charts, otherwise known as Shewhart charts.
8. John E. Karlin is considered to be the 'father of human-factors engineering' in American industry, and the inventor of the push-button telephone keypad.

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