

The complete reduction of noise presupposed by the conceptual logic of noise reduction would produce an entirely clean output consisting of a meaningful silence framing clearly delineated, unambiguous information. The physical operations of technological noise reduction systems, however, are not as perfect as this ideal suggests. Their output is marked by something that “sticks in place”—the noise of technological transmission channels. The presence of this noise points to a fundamental distance between ideal models according to which noise is always clearly defined and precisely located (as presupposed by the conceptual logic of noise reduction and Sterne’s domestication of noise) and the physical operations of technological systems.

2.3 From ideal models to physical filters

a) *Ulysses and Orpheus: blocking or masking noise*

In *The Five Senses*, Michel Serres highlights the distance between ideal models supporting the idea of perfect noise reduction and the physical operations of technical filters with the metaphor of two mythical Greek ships carrying two Greek heroes—Ulysses and Orpheus—past the deadly Sirens, luring the men and their crew two shipwreck with their singing. For Serres, the myths exemplify two ways to confront the problem of noise in communication systems: the sailing ship is the signal, the sea is the channel and the Sirens provide continuous background noise. In the case of Ulysses’ journey, the ears of his men are clogged with wax and the hero himself tied firmly to the mast, unable to move. With wax and physical restraint, Serres writes, Ulysses “blocks noise out” (2008: 126). He hears the Siren noise, but it does not affect the successful transmission of his signal/ship, because the ears of the men are stuffed. Orpheus, the famous singer and musician, sailed past the Sirens as well, together with the Argonauts on their ship the Argo. He, however, was not tied to the mast and the ears of his companions were not clogged with wax. He did not “block noise out.” Orpheus covered it with singing and playing (126).

The cunning, resourceful Ulysses, the great teller of tales, is a man of reason and logic, a man of words. Always looking for practical solutions and unambiguous answers, his triumph over the Sirens is based on a clever

ruse: he blocks out their noise to ensure the safe and steady passage of his ship, ensuring the clean transmission of his signal through the noisy channel. With less noise, signals are transmitted better and faster, which is why it is “hardly surprising,” Serres writes, “that his messages are heard” (126). Because he manages to successfully sail his ship through the channel and reach the other side unharmed, Ulysses is in the position to tell the story as if the Sirens did not get through to him and his noise reduction strategy worked perfectly. History is written by the victors, which is why the story of Ulysses’ ruse has been told for millennia.³⁰ Ulysses, Serres writes, “mak[es] it through the pass in silence, but cheats by suppressing all noise, danger or temptation” to successively claim absolute victory over the Sirens’ noise (122).

Orpheus’ strategy is different. He performed an example of auditory masking *avant-la-lettre*: drowning out the noise with his music. Covering Siren-noise with singing-signal he proves that, to use Sterne’s definition of auditory masking, “noise could be masked and put in its place” (2012: 94-95). Serres argues, however, that this victory is much more precarious than the triumph claimed by Ulysses. Contrary to Ulysses’ ruse, Orpheus’ masking is relative and remains “open to the risk of collapsing into noise” (2008: 126). With Orpheus’ strategy, noise is not eliminated. “Ears open,

³⁰ In the first volume of *Musik und Mathematik*, Kittler presents an alternative interpretation of Ulysses’ journey past the Sirens (2006b: 56-58). With the Siren song, he writes, “fängt alles Senden in Europa an.” However, as Kittler empirically tested by sailing past the Italian islands Il Gallo Lungo, Casteltuccia and Rotonda while opera singers were singing at shore, contrary to what Homer writes, Ulysses cannot have received the Siren song from his ship as clearly as he claims. “Wir hörten klar und rein [...] Stimmlaute strahlen,” Kittler describes the results of the experiment, “doch von Mit- und Stummlaute nicht die geringste Spur. So hat uns denn kein Wort erreicht.” If Ulysses really stayed on board, tied to the mast, as Homer describes, the transmission of the Siren song would have failed, because the noise of the sea overwhelms the words as only vowels reach Ulysses’ ears. Since these words are nonetheless written down by Homer, Kittler concludes, Ulysses must have lied. He did not sail past the island, but landed and made love to the Sirens. Hence, if we are to trust Kittler and with him the Sirens, although Ulysses claims the Siren song reached his ears loud and clear, he is betrayed by the necessary noise of consonants, without which the words of the song would not have made any sense and which Kittler ‘proves’ must have been lost in the transmission from island to ship. Hence, Kittler warns, “nicht dem grössten Lügner Griechenlands, sondern zwei Sirenen glauben.”

carrying his instrument before him, waxen heart bared to the winds, Orpheus confronts the chaos” (126). The noise is temporarily suppressed, but can crop up at any time. Orpheus does not adhere to the ideal of complete noise reduction and reveals its relative and temporary basis. Years later, when he attempted to drown noise with singing and playing for a second time to get past the wild Bacchantes, he got ripped apart and died: noise reduction is never complete (126).

For Serres, Ulysses’ story, told as if no noise got through to him, is exemplary of the way that “science presupposes a world without noise” (126). Science, logic and reason presuppose a well-ordered world of clear answers, noiseless signals and pure information. The most famous example of this rationalist worldview, he argues, is Leibniz’s Law of Continuity, captured by the famous dictum that ‘nature does not make jumps’ (126).³¹ According to Serres, with the Law of Continuity in the *New Essays to Human Understanding* and the concept of the perfectly self-contained monad as elementary ontological unit in *The Monadology*, Leibniz “presupposed a world without noise” as well (126).

This world, as physicists Ilya Prigogine and Isabelle Stengers put it in their Postface to Serres’ *Hermes*, is a world “without friction or holes” (1982: 155). It is the world of *The Monadology*, according to which each monad, each element “supposes and translates th[e] system in every detail,” suggesting the possibility of a “full passage between the local and the global” (144). In a world in which each part reflects the whole and vice versa, there is complete continuity from the smallest to the largest element and ambiguity, inextricability and confusion do not exist. A world governed by the Law of Continuity is a world without the randomness and contingency of noise. This is why, for Serres, “Leibniz is bound to Ulysses” (126). By extension, I argue, the ideal of complete noise reduction that conceptually frames Dolby’s technological operation is bound to both Ulysses’ clever ruse and Leibniz’s noiseless world. By suggesting

³¹ In the *New Essays on Human Understanding*, first published posthumously in 1765, Leibniz writes: “In nature everything happens by degrees, and nothing by jumps; and this rule about change is one part of my law of continuity” (1996: 473).

that every signal can get through the channel in full clarity, the conceptual logic of noise reduction assumes that pure, clear and transparent transmission is always possible.

Notwithstanding his self-declared triumph over irrationality, inextricability, confusion and noise, however, Ulysses' rational ruse is inherently limited. Regardless of the heroic claims of Ulysses, the rational system of Leibniz and the technical filters of Dolby, Serres remarks in *Genesis*, "the purest is never pure enough to remain the master forever" (1995: 131). As Orpheus' fate shows, the purity ensured by noise reduction is relative and precarious. Ulysses', Leibniz's and Dolby's ideal, noiseless world presupposes the possibility of complete reduction, but as Orpheus' strategy shows and Shannon's mathematical model of communication confirms, this world is ultimately impossible, because, regardless of the method of reduction, noise is internal to the system itself. Thus, like Orpheus' attempts to keep the Sirens and Bacchantes at bay by covering their noise with singing and playing—succeeding the first time and failing the second—noise crops up time and time again. Even more so, not only is the reduction process never complete, it is itself subject to the logic of Shannon's model of communication: as signals travel through the physical channels of noise reduction systems, they inevitably contract noise.³²

Ulysses and Orpheus both apply filters that separate signals from noise and mortal men from murderous Sirens, but their respective filters operate on a different basis. The perfect separation of signal and noise and absolutely smooth sailing of Ulysses' heroic account would have required a perfectly transparent filter that, like Dolby's "ideal audio device," imposes no "limitation on the signal passing through" (Dolby Laboratories 1987: 2). Orpheus' singing, on the other hand, reveals how every noise reduction filter is applied with specific criteria, using specific standards in a specific context, and no signal passes through a channel without being affected. Some noise gets through, no matter what. Regardless of the fact that Dolby's most advanced SR system "can create an infinite number of filters through which the signal must pass before it is recorded," these filters can only be applied to those elements that the system identified as noise in the

³² As Stäheli concludes as well: "every reduction of noise produces a noise of its own" (2003: 253).

first place (Dolby SR 1987: 5). Instead of the ideal passage or perfect journey suggested by Ulysses' heroic stories, conceptualised by Leibniz's Law of Continuity and marketed by Dolby Laboratories' brochures, noise reduction is an active, on-going and inherently incomplete procedure. It is not an ideal filter that effortlessly separates clearly defined signals from precisely located noise. It is a physical filter that, like Orpheus' singing and playing, is continuously and precariously masking noise with signal, all the while taking the risk of being affected by the very process of noise reduction itself.

Hence, Sterne's notion of the domestication of noise cannot be the final word on the role of noise in sound recording. Because something always sticks in place, what is received on one end of the channel is not the same as what went in. Even more so, as the concealing and revealing of the companding procedure shows, what comes out as a supposedly noiseless original retroactively shapes our understanding of what 'originally' went in. Hence, I propose that not the supposedly inherent connection between input and output or the supposedly clear difference between signal and noise should be the focus of an assessment of the role of noise in sound recording (as the myth of perfect fidelity and the conceptual logic of noise reduction would have it), but the technological operations of the filtering channel itself, which continuously conceal and reveal, configure and reconfigure different layers of and different relations between signal and noise.

b) *A more rigorous filter: from Dolby to dither*

The relation between pre-war communication engineering and the postwar concept of noise in information theory, explained in Section 1.1c and Section 2.1b on the basis of analyses by Schwartz and Mills, showed that the operations of dual-ended noise reduction systems are conceptually framed by the assumption that signal and noise can be completely separated. However, as Weaver explains in his commentary on Shannon, Information theory also shows that noise and signal cannot be separated entirely because noise is internal to all transmission channels (Shannon and Weaver 1964: 22). Following Stäheli's critical reading of this information theoretical frame, I therefore conclude that, firstly, noise