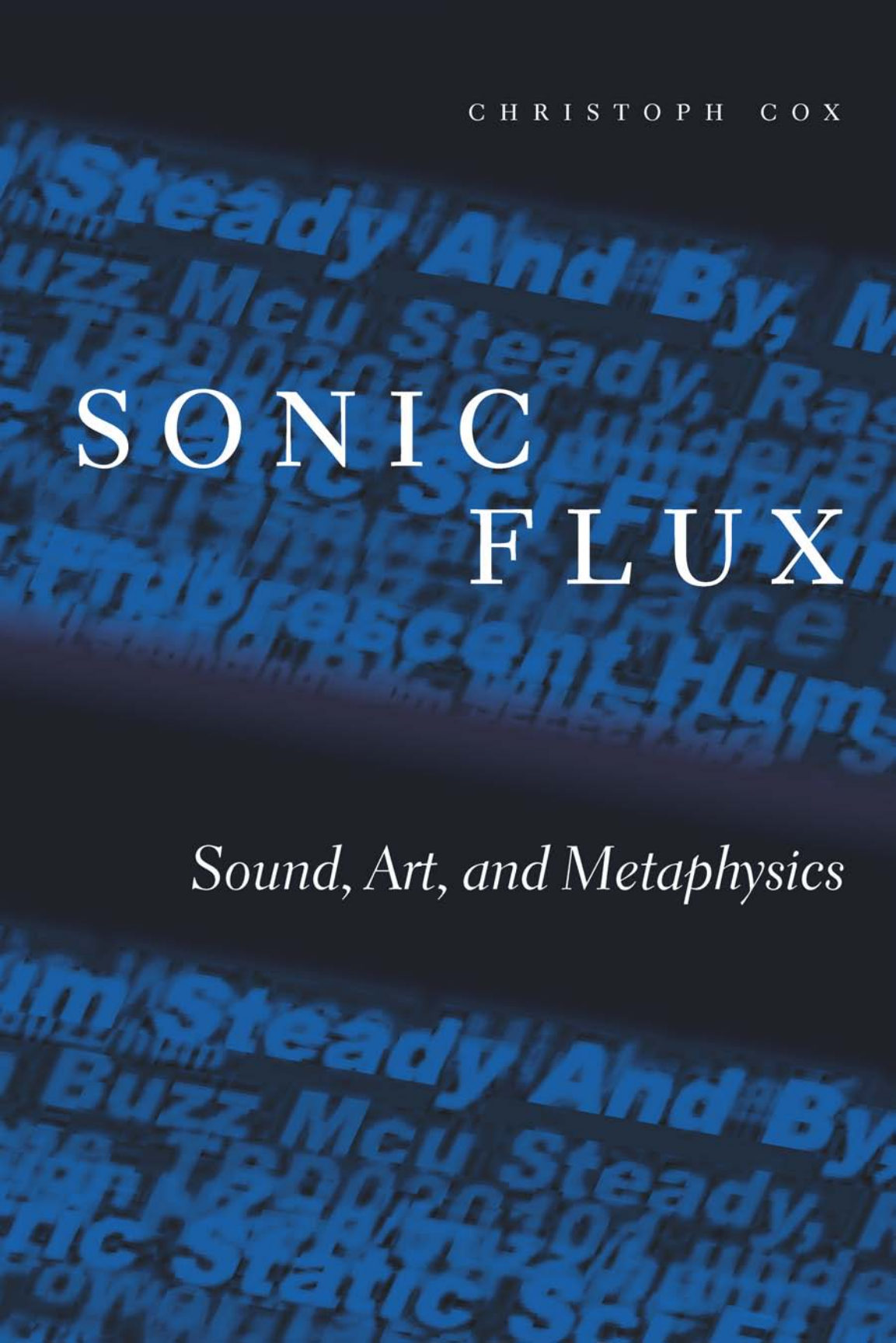
CHRISTOPH COX



SONIC FLUX

Sound, Art, and Metaphysics

SONIC FLUX

SOUND, ART, AND METAPHYSICS

Christoph Cox

THE UNIVERSITY OF CHICAGO PRESS
CHICAGO AND LONDON

The University of Chicago Press, Chicago 60637
The University of Chicago Press, Ltd., London

Published 2018
Printed in the United States of America

27 26 25 24 23 22 21 20 19 18 1 2 3 4 5

ISBN-13: 978-0-226-54303-1 (cloth)
ISBN-13: 978-0-226-54317-8 (paper)
ISBN-13: 978-0-226-54320-8 (e-book)
DOI: https://doi.org/10.7208/chicago/9780226543208.001.0001

LIBRARY OF CONGRESS CATALOGING-IN-PUBLICATION DATA

Names: Cox, Christoph, 1965– author.
Title: Sonic flux : sound, art, and metaphysics / Christoph Cox.
Description: Chicago ; London : The University of Chicago Press, 2018. | Includes bibliographical references and index.
Identifiers: LCCN 2018015041 | ISBN 9780226543031 (cloth : alk. paper) | ISBN 9780226543178 (pbk. : alk. paper) | ISBN 9780226543208 (e-book)
Subjects: LCSH: Music—Philosophy and aesthetics. | Soundscapes (Music)—Philosophy and aesthetics. | Sound (Philosophy) | Sound installations (Art) | Metaphysics.
Classification: LCC ML3877.C77 2018 | DDC 534—dc23
LC record available at https://lccn.loc.gov/2018015041

♾ This paper meets the requirements of ANSI/NISO Z39.48–1992
(Permanence of Paper).

6 AUDIO/VISUAL

AGAINST SYNAESTHETICS

In the summer of 2005 the New York City media art center Eyebeam hosted an exhibition titled *What Sound Does a Color Make?*, described by the curators as presenting work by contemporary artists "who conflate sound and vision," using digital technology "to explore the sense of synesthesia."[1] Alongside video projections, installations, and interactive play stations by a new generation of artists, the exhibition featured a selection of classic video artworks from the 1970s that used image to manipulate sound and vice versa. The Eyebeam show joined a spate of exhibitions that drew analogies between artistic practices and synaesthesia, the neurological condition in which stimulation of one sensory modality triggers involuntary sensation in another, such that, for example, one sees sounds or hears odors. A few months prior, the Museum of Contemporary Art, Los Angeles and the Centre Pompidou in Paris mounted different but overlapping large-scale surveys that situated contemporary audiovisual crossovers within the history of synaesthetic art experiments since 1900. Both MOCA's *Visual Music* and the Pompidou's *Sons & lumières* drew parallels between the concerns of early twentieth-century painters such as Wassily Kandinsky and Hans Richter, who attempted to render sound as image, and early twenty-first-century media artists such as Jim Hodges and Christian Marclay, whose visual art is often prompted by musical concerns.

Such efforts to conjoin sound and image have become common in the post-millennium art world, evident in more recent exhibitions such as *See This Sound* at the Lentos Kunstmuseum Linz (2009), *Art & Music: Search for New Synesthesia* at the Museum of Contemporary Art Tokyo (2012), *Art or Sound* at

the Fondazione Prada Venice (2014), and *Soundscapes* at the National Gallery in London (2015). All these exhibitions represent attempts by visual arts institutions to come to terms with the emergence of sound art as a distinct field and with audio as an increasingly prominent medium for artists since the late 1990s. In nearly all cases, the reception of sound has been ambivalent. While officially opening their doors to sound, galleries and museums have at the same time manifested considerable anxiety about this new guest. This is tellingly manifested in exhibitions organized under the banner of synaesthesia, which ensures that sound is admitted only under the condition that it be chaperoned by the visual and, more often than not, has served as a mechanism by which to silence rather than amplify the sonic.

In this final chapter, I want to explore these conjunctions of sound and image in twentieth- and twenty-first-century art, examining the promises of sensory unity, the anxious appropriation of sound within the visual arts, and the potential for productive confrontations and collaborations between the audio and the visual. Operating between and beyond traditional aesthetic categories, sound art has rekindled promises and anxieties rooted deep in the history of visual modernism, which, far from welcoming sound, reveals a series of vexed encounters with it.

From *Gesamtkunstwerk* to Synaesthesia

We humans are endowed with five senses, five different channels through which we gather information about our ever-changing environment. Communicating between inside and outside, four of these sensory channels originate in facial orifices—eyes, ears, nose, and mouth—that open our bodies onto the world. The remaining sense, touch, is dispersed across the entire surface of the skin, an enveloping membrane that registers the minutest of stimuli.

The division of the arts largely accords with this sensory distribution and fragmentation, and also with the traditional hierarchy that separates the two "noble senses" (seeing and hearing) from their more vulgar associates (taste, touch, and smell). Painting and sculpture address the eyes, music the ears. The former belong in the museum or gallery, the latter in the concert hall. Each has its own history, which only rarely overlaps with the other. And while there are surely mixed arts—theater and cinema, for example—we still unproblematically speak of "the visual arts" and distinguish them from music as apples to oranges.

However, despite this sensory fragmentation, physiological dispersal, and aesthetic hierarchy, we experience the world as a unity. We don't feel ourselves to be constantly coordinating and translating between heterogeneous streams of sensory data. Rather, the world seems to come to us undivided and complete. Acknowledging this mysterious emergence of unity from plurality, Aristotle posited a sort of shared sense—a *koinē aisthēsis*, *sensus communis*, or common sense—whose role was to connect the five sensory streams and ensure their agreement with one another.[2] Aristotle's hypothesis profoundly influenced his successors; and variants of it continue to inform current scientific research.[3]

If we experience the world as a sensory unity, shouldn't the arts affirm this union? On this question, modernism was deeply divided. One of its most powerful and influential theorists, Clement Greenberg, argued that the distinctiveness of the modern consisted precisely in the segregation of the arts from one another and the autonomous development of each. In particular, Greenberg was concerned to purge the visual arts of every extravisual sensation (tactility, for example) in order to render them "purely optical."[4] The Russian filmmaker Dziga Vertov agreed, celebrating the "kino-eye." "We protest against the mixing of the arts which many call synthesis," he wrote in a 1922 manifesto. "The mixture of bad colors, even those ideally selected from the spectrum, produces not white, but mud. . . . WE are cleansing *kinochestvo* of foreign matter—of music, literature, and theater; we seek our own rhythm, one lifted from nowhere else."[5] Nonetheless, from the outset, prominent modern artists pressed an alternative position, advocating for sensory and aesthetic unity. This call was boldly sounded by the composer and dramatist Richard Wagner in his 1849 essay "The Artwork of the Future," which insisted that only a true synthesis of all the arts—a *Gesamtkunstwerk* or "total work of art"—could realize art's true purpose. Wagner wrote:

> Each separate faculty of man is limited by bounds; but his united, agreed, and reciprocally helping faculties—and thus his faculties in *mutual love* of one another—combine to form the self-completing, unbounded, universal faculty of men. Thus too has every *artistic* faculty of man its natural bounds, since man has not *one only Sense* but separate *Senses*; while every faculty springs from its special sense, and therefore each single faculty must find its bounds in the confines of its correlated sense. But the boundaries of the separate senses are also their joint meeting-points, those points at which

they melt in one another and each agrees with each: and exactly so do the faculties that are derived from them touch one another and agree. Their confines, therefore, are removed by this agreement; but only those that love each other can agree, and "to love" means: to acknowledge the other, and at like time to know one's self. Thus Knowledge through Love is Freedom; and the freedom of man's faculties is—*All-faculty*.

Only the Art which answers to this "all-faculty" of man is, therefore, *free*; and not the Art-*variety*, which only issues from a single human faculty. The Arts of Dance, of Tone, of Poetry, are each confined within their several bounds; in contact with these bounds each feels herself unfree, be it not that, across their common boundary, she reaches out her hand to her neighbouring art in unrestrained acknowledgment of love. The very grasping of this hand lifts her above the barrier; her full embrace, her full absorption in her sister—i.e., her own complete ascension beyond the set-up barrier—casts down the fence itself. And when every barrier has thus fallen, then are there no more *arts* and no more boundaries, but only *Art*, the universal, undivided.[6]

In the decades that followed this proclamation, Wagner's call for a union of the senses was bolstered by a burst of interest—artistic *and* scientific—in the related but distinct phenomenon of synaesthesia. The *Gesamtkunstwerk* promised to conjoin all the arts and stimulate all the senses at once. Synaesthesia is also characterized by a union of the senses but generally only of two, and in an asymmetrical configuration: a primary, inducing sensation—for example, sound—that activates a secondary, concurrent sensation—for example, color. This neurological condition had fascinated philosophers and scientists at least since 1690, when John Locke reported the case of a blind man who claimed to understand the color scarlet as the sound of a trumpet.[7] But it wasn't until the late nineteenth and early twentieth centuries that synaesthesia became a hot topic for scientific research.[8] It also sparked the interest of painters, composers, and poets, who were drawn to the imaginative possibilities and spiritual resonances of sensory union. In his celebrated poem "Correspondences" (1857), Charles Baudelaire wrote of "odors . . . sweet as flutes, and green as any grass."[9] Baudelaire's Symbolist compatriot Arthur Rimbaud drew equivalences between vowels, colors, textures and odors: the letter "A" invoked a "black hairy corset of shining flies / Which buzz around cruel stench"; "E," the "whiteness of vapors and tents"; and so on.[10] As visual artists began to abandon figuration

Fig. 6.1 Wassily Kandinsky, *Impression III (Concert)*, 1911. Oil on canvas, 30⅞ × 39⁹⁄₁₆ inches. Städtische Galerie im Lenbachhaus und Kunstbau München.

and approach abstraction, they often looked for inspiration to music, conceived as the purest and least mimetic of the arts. "All art constantly aspires towards the condition of music," declared the critic Walter Pater in 1877, a remark echoed by many pioneers of pictorial abstraction.[11] Kandinsky's proto-abstract painting *Impression III (Concert)* (1911; fig. 6.1) was directly inspired by the thrill of hearing Arnold Schoenberg's first atonal works at a concert in Munich. Others such as Paul Klee, Marsden Hartley, and František Kupka took inspiration from Bach, attempting visual counterpoint akin to the rhythmic structure of the fugue.

The late nineteenth-century craze for synaesthetic cross-wirings prompted inventors to abandon traditional artistic media and musical instruments and instead to build new machines that attempted to connect sound with color. In the late 1860s the Alsatian chemist and musician Frédéric Kastner developed an instrument he called the Pyrophone, in which a small keyboard produced both sound and colored light by igniting gas jets that lit thirteen crystal pipes protruding from a console. The invention struck Wagner as a promising facilitation of the *Gesamtkunstwerk*; and

the composer made a failed attempt to finance its use in his operatic productions.[12] Two and a half decades later the British inventor and art professor Alexander Rimington built what he was the first to call a "color organ," an instrument that made no sound but used a standard organ keyboard to illuminate fourteen arc lamps that glowed with different shades and intensities of color.

Kastner's and Rimington's inventions sparked widespread fascination with "visual music," provoking artists and inventors to construct numerous variants on the color organ. In the first few decades of the twentieth century, the artistic avant-garde was drawn to these inventions not so much as musical instruments, but as mechanisms capable of animating abstract forms through a sort of cinematic projection. The Russian Futurist painter Wladimir Baranoff-Rossiné developed his *piano optophonique* (1920–23), a complex keyboard-controlled contraption that made sounds while projecting light through an array of mirrors, filters, lenses, and hand-painted discs. At the Weimar Bauhaus, Ludwig Hirschfeld-Mack constructed a machine that translated music into projections of mobile forms and colored light. The Danish-American artist Thomas Wilfred upgraded the color organ with his Clavilux (1922), which employed a bank of dials and sliding keys to rotate bulbs and mirrors that displayed ethereal, flamelike wisps of dancing color he called "Lumia."

These live projections of visual music were paralleled by the exploration of musically inspired (but primarily silent) abstraction on film. As in the work of Baranoff-Rossiné and Hirschfeld-Mack, the "absolute film" of Hans Richter and Viking Eggeling (modeled on the purely instrumental "absolute music" of the nineteenth century) aimed to animate the rhythmic and harmonic relationships inherent in nonrepresentational painting, endowing them with the temporal dimension characteristic of music. The pulsing, growing, shrinking, and overlapping rectangles in Richter's *Rhythmus 21* (1921; fig. 6.2) are meant to evoke the musical experience of volume, pitch, harmony and, above all, rhythm. In Eggeling's *Symphonie diagonale* (1924), a series of comblike forms alternate and succeed one another like chords, while curved and angled lines are drawn on the screen like silent melodies.

True to Pater's formulation, all these art forms—abstract canvases, color organs, and absolute cinema—aspired not so much to music as to its "condition," that is, to its nonrepresentationality, temporality, rhythm, and, often, its perceived "spirituality." No *Gesamtkunstwerke*, these generally silent artistic forms made little attempt to conjoin the visual with the sonic. Some

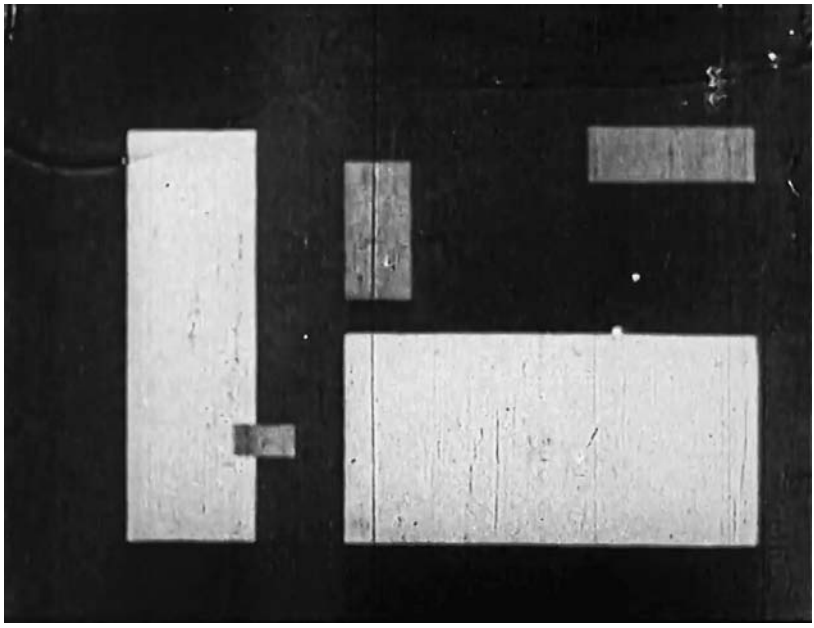


Fig. 6.2 Hans Richter, *Rhythmus 21*, 1921–24, 35mm film, 5 minutes, b&w, silent.

artists may have hoped synaesthetically to evoke the experience of sound by means of image. Yet, for the most part, music was called upon as an artistic precedent or existing model to validate visual art's perilous move toward abstraction, enabling painters and filmmakers to thwart the criticism that nonrepresentational art was arbitrary, childish, or merely decorative.[13] "One can compare Coloured Rhythm to music," wrote Guillaume Apollinaire in 1914, discussing the visual music experiments of Léopold Survage, "but the analogies are superficial, and it really is an independent art having infinitely varied resources of its own."[14] As Greenberg put it, the visual avant-garde appropriated music as method rather than as sensual effect.[15] Paradoxically, then, music and sound enabled the visual arts to pursue their own purely optical aims.

Sound/Image

With the advent of sound cinema in the late 1920s, the dream of the *Gesamtkunstwerk* and of a synaesthetic art would seem to have been realized. Artists such as Mary Ellen Bute enthusiastically embraced this idea, producing

Fig. 6.3 Introductory title, Mary Ellen Bute, *Synchromy No. 2*, 1936, 16mm film, 5 minutes, b&w, sound.

a series of "Seeing Sound" films in the 1930s that attempted "to create moods through the eye as music creates moods through the ear" by providing "a pictorial accompaniment in abstract forms" to music by Wagner, Edvard Grieg, Camille Saint-Saëns, and J. S. Bach (fig. 6.3).[16] Bute described her film *Rhythm in Light* (1934) as "a modern artist's impression of what goes on in the mind when listening to music."[17] Likewise, Oskar Fischinger introduced his 1938 film *An Optical Poem* with a title that read: "To most of us music suggests definite mental images of form and color. The picture you are about to see is a novel scientific experiment. Its object is to convey these mental images in visual form."[18]

Yet the development of sound film was not universally celebrated by filmmakers and other artists. In 1928 three of the most prominent representatives of Soviet cinema, Sergei Eisenstein, Vsevolod Pudovkin, and Grigori Alexandrov, issued a statement warning that sync sound would surely be used merely to bolster cinematic illusion and favor the visual. "Sound used in this way," they noted, "will destroy the culture of montage." Instead, the trio advocated the nonsynchronization of sound and image, a contrapuntal

relationship between the two that would resist the subordination of sound to image, encouraging a tension that could thwart naturalistic illusion. To this end, the trio concluded, "*the first experiments in sound must aim at a sharp discord with the visual images*."[19] The playwright, theorist, and film actor Antonin Artaud also objected to the arrival of "talking pictures," but primarily because they favored speech and other articulate sounds at the expense of the rich and vast domain of noises that, like Luigi Russolo, Artaud felt would form the sonic art of the future.[20]

A few years later Walter Ruttmann took up and pushed to the extreme these calls for the exploration of noise and the nonsynchronous relationship between sound and image. One of the founders of absolute film, Ruttmann inverted his early experiments in "visual music." His 1930 film *Weekend* consists solely of a soundtrack without images: an eleven-minute collage of concrete noises—hammers, cash registers, sirens, voices, incidental music, and so on—that denies the viewer any visual accompaniment. The film might be understood as a complement to the silent visual music of Richter's *Rhythmus 21*, Eggeling's *Symphonie Diagonale*, or Ruttmann's own *Opus* series; yet the prevailing cinematic hierarchy of the visual over the sonic prevents this complementarity, ensuring that the absence of the visual is experienced not so much as an invitation to synaesthesia than as a lack and disjunction between sound and image.[21] Ruttmann himself referred to *Weekend* as "a blind film," remarking that it "employed sound as an end in itself" rather than as a provocation for the visual imagination.[22]

Such resistance to the seamless merging of sound and image, of hearing and seeing, is as prevalent in modern and contemporary art as is the desire for synaesthetic union or the *Gesamtkunstwerk*. It comes in part from the suspicion that any convergence of the senses is likely to retain the hierarchy that subordinates all other modalities to the visual. It is equally born of the desire not to eliminate the unique differences between the senses and the rich aesthetic tensions these differences generate.

While Kandinsky, Klee, and many other early modernists pursued the dream of *synaesthesia*, Marcel Duchamp instead championed *anaesthesia*. The selection of the "readymades," he noted, "was based on a reaction of visual indifference with at the same time a total absence of good or bad taste . . . in fact a complete anesthesia."[23] Indeed, Duchamp consistently resisted the notion that art should be primarily "retinal," aiming instead to push it toward the conceptual and the verbal. Likewise, in several works he aimed at a noncochlear sonic art, or what one critic calls "music for the

deaf," "silent noise."[24] With his sisters Yvonne and Magdeleine, Duchamp composed *Erratum Musical* (1913), a score generated by a chance technique (picking notes out of a hat) accompanied by a readymade lyric (the dictionary definition of a randomly chosen word, *imprimer*: "To make an imprint mark with lines a figure on a surface impress a seal on wax").[25] Both the text and the title allude to printing: the text to the phono-graphic impression of lines or figures on a wax surface, the title to a misprint in written signs (words or musical symbols). Indeed, the title suggests that the piece itself is an error—perhaps the error of conceiving the silent wax cylinder or printed visual score as "musical." The "assisted readymade" *With Hidden Noise* (1916) also presents the visual object as faulty and sound as purely conceptual. Though the work is in principle a sound-making toy, when elevated to the status of an art object displayed inertly in a museum it loses this auditory character, the trace of which remains only in the title, its sonic source now "hidden" or "secret," suggested by language alone. Finally, Duchamp's rotary works—*Disks Bearing Spirals* (1923), *Rotary Demisphere (Precision Optics)* (1925), *Anemic Cinema* (1926), and *Rotoreliefs* (1935)—blend phonography with cinema while undercutting both. Flipping the turntable on its side, Duchamp replaces the coiled grooves of the phonograph record with spiraling textual puns and vortices of visual lines. Music becomes silent cinema, but an anemic cinema of hypnotic repetition.

A whole lineage of Duchamp-inspired art followed suit. Joseph Beuys's *The Silence* (1973), for example, is a sculptural object consisting simply of the five reels of Ingmar Bergman's 1962 film *The Silence*, the film's celluloid drenched in copper and zinc and sealed in galvanized canisters. Eliminating both sound and image from Bergman's film, Beuys's stack of canisters draws attention to film not as "talking pictures" but as mute material. This line of attack is furthered in Christian Marclay's *The Sound of Silence* (fig. 2.4), a photograph of Simon & Garfunkel's 1964 single "The Sound of Silence" that displays the record as a mute visual object. Marclay's piece references Beuys and Duchamp but also René Magritte, whose famous 1929 painting *The Treachery of Images* presents the bluntly scribbled text *Ceci n'est pas un pipe* ("This is not a pipe") below a stylized image of a pipe. Magritte's painting highlights the disjunctions between word, image, and object. Marclay's photograph extends this disjunction to sound, noting, like Beuys, that this mute image and object capture the silence to which Simon & Garfunkel's song and Bergman's film could only paradoxically allude. Marclay's piece is a joke, but an epistemologically and ontologically profound one, the humor

of which consists in an evident confusion of categories: photograph, object, and text are absurd because they cannot be what they claim they are. Sound is thereby shown to be of another order, one inadequately represented or even foreclosed by the imaginary domain of the visual and the symbolic domain of the written word.

In the late 1940s the radio-engineer-turned-composer Pierre Schaeffer celebrated a defining property of audio recording and radio transmission: the ability to separate sounds from their visible sources. This affirmation cut against the grain of modern thought, for influential theorists such as Martin Heidegger, Theodor Adorno, and Max Horkheimer had assailed these technologies for dulling our auditory sensibility.[26] Schaeffer, however, argued that records and radio triumphantly subvert the hegemony of vision and make possible the experience of "sound as such." In doing so, Schaeffer reasoned, they revive a neglected form of listening he termed "acousmatic," in deference to the ancient *akousmatikoi,* disciples of Pythagoras who were made to listen to their master's voice while he was hidden behind a curtain.[27] Bruce Nauman's *Concrete Tape Recorder Piece* (1968) is a Duchampian pun on Schaeffer, and also an homage to *With Hidden Noise* and a response to Robert Morris's *Box with the Sound of Its Own Making* (1961). A 650-pound concrete block with a power cord protruding from it, this piece was described by Nauman as a "tape recorder with a tape loop of a scream wrapped in a plastic bag and cast into the center of a block of concrete." Here, too, the noise is hidden, silent—or rather silenced, for Nauman's piece is more ominous than Duchamp's or Morris's. Its sound is entombed—repeated infinitely but inaudible, buried by the sculptural form that negates it. As such, the piece is perhaps an analog to Edvard Munch's *Scream* (1893) but more confounding, its sonic source denied all expression, auditory or visual.

Schaeffer's position remains a significant one within the practice of sound art today, manifested most dramatically in the work of the Spanish artist Francisco López, who, in live performance, distributes blindfolds to his listeners, seats them facing away from him, and delivers sonic abstractions that generally thwart recognition of the concrete sounds from which they are generated. Any sound art worthy of the name affirms something of this effort to restore to sound its ontological and aesthetic value. Yet for the most part, contemporary sound artists and their curators have been interested in *negotiating* the visual, rather than *rejecting* it wholesale. In fact, the very tension of such negotiation is often central to this uncertain art form

operating between music and visual art, medium specificity and a postmedium condition. Without rejecting multimedia and multimodal work, sound art reminds us that seeing is not hearing and aims to thwart the imperial aspirations of the visual.

Synaesthetics 2.0

As with the synaesthesia craze of a century ago, the contemporary art world's attraction to sensory cross-wirings is part of a more general cultural formation. In current scientific research, for example, freak occurrences of colored hearing or tactile smell have become the objects of a booming industry within the flourishing field of cognitive neuroscience. Though synaesthesia affects at most 4 percent of the population and is considered a benign condition rather than an illness,[28] scientific research on the phenomenon has grown steadily since the 1980s, with a particular burst of interest since 2000.[29] Much of this new interest can be attributed to the development of brain-imaging technologies—notably fMRI (functional magnetic resonance imaging) and PET (positron emission tomography)—that, not coincidentally, are themselves "synaesthetic" in their psychedelic visual representation of nonvisual sensory phenomena.[30] This fascination with imaging, the desire and ability to present all information visually, and the epistemological priority of the visual are intensified in digital culture, in which the image has become currency and seeing ("eyeballs," in Internet advertising parlance) is pervasively monetized.[31]

But calling brain-imaging technologies "synaesthetic" is linguistically and conceptually sloppy. Such technologies do not conjoin different senses, allowing them to be experienced together; rather, they translate one kind of data into another. Indeed, more generally, digital technologies do not facilitate a union of the senses but make possible something quite different: the intertranslatability of media—for example, the ability to render sound as image or (in principle) image as sound. As Friedrich Kittler foresaw back in the mid-1980s,

> The general digitization of channels and information erases the differences among individual media. Sound and image, voice and text are reduced to surface effects, known to consumers as interface. Sense and the senses turn into eyewash. . . . Inside the computers themselves everything becomes a number: quantity without image, sound, or voice. And once optical fiber

> networks turn formerly distinct data flows into a standardized series of digitized numbers, any medium can be translated into any other.[32]

Such facile translations are too often called "synaesthetic" in art today. Moreover, they are almost invariably unidirectional: everything is rendered in the dominant language of the image.[33] "It is always the screen that radiates power and spectacle," writes the composer and film theorist Michel Chion, "and it is always the image, the gathering place and magnet for auditory impressions, that sound decorates with its unbridled splendor."[34] Early abstraction summoned music in the service of its own purely visual ends. In audiovisual work today, visuality is the supplement that comes to the aid of the sonic and thereby testifies to its poverty. Music videos, YouTube clips, and all the monitors, screens, and projection surfaces that populate galleries and museums today reveal the need for sound to be made whole through the image, and the need to secure its fugitive, diffuse, and permeable material within the bounds of a rectangular frame. Bute's "seeing sound" films already manifested both these attitudes—sound as an alibi for the abstract image and the visual as a necessary supplement for the sonic. The latter prevails in "visual music" projects today. Take, for example, *Optofonica*, a 2009 collection curated by the Italian artist Tez, who presents twenty-two visualizations created by or in collaboration with prominent electronica producers such as Scanner, Kim Cascone, Richard Chartier, Kaffe Matthews, and Kurt Hentschläger. Introducing the compilation, the Dutch synaesthesia researcher Cretien van Campen promises "synesthetic experiences of colored sounds or musical images."[35] Yet, though many are elegant and inventive, the videos arbitrarily conjoin electronic music often deemed "abstract" with image tracks that, though for the most part nonrepresentational, serve to concretize and ground the music. No neurological or aesthetic necessity conjoins these registers—no synaesthesia but only synchresis, the habit of associating anything one hears with anything one sees.[36]

Nonetheless, this imbalance of media and sensory modalities in contemporary art is true to the neurological experience of synaesthesia. Just as sound-image correlations in "synaesthetic" art projects are largely arbitrary, so too are cross-modal correlations neurologically idiosyncratic: within the population of synaesthetes, there is no regularity at all in, for example, sound-color pairings. Moreover, while this condition (and the aesthetic analogy to it) may suggest the ideal of sensuous plenitude and sensory cross-mixing, by far its most common expression is the unidirectional

visual experience of sound. (Sound induced by sight is extremely rare.)[37] In the aesthetic domain, even when generated to enhance aural experience—for example, the 1960s light shows featured in several recent exhibitions; music videos; or the iTunes Visualizer—the visual is almost never a mere accompaniment to the auditory. As the film theorist Christian Metz points out, our syntax and entrenched sensual hierarchy hold us in thrall to a metaphysics according to which sight and touch signify being and presence, while sound—spatially vague, materially elusive, and temporally ephemeral—signifies absence and can only have the status of a secondary "attribute" in relation to a primary visual and tactile "substance."[38] Cinema might in principle be a synaesthetic art, an intersensorial conjunction of sound and image. In practice, however, cinematic sound is almost invariably subservient to the image.[39] So it is with synaesthetic art more generally. Indeed, the dominance of the visual in synaesthetic art corresponds with the prevailing idea that sound-in-itself is unnatural or inadequate, in need of an anchor in the visible.

Sound Figures

Another line of inquiry and experimentation, however, promises more direct and non-arbitrary correlations between sound and image. In 1787 Ernst Chladni, known today as the father of modern acoustics, drew a violin bow along the edge of a brass plate sprinkled with a thin layer of sand. The vibrating surface bounced the granules into symmetrical forms: stars, waves, grids, and labyrinths he termed "sound figures" (*Klangfiguren*; fig. 6.4). Chladni's demonstration seemed to make visible and palpable the hitherto elusive and fleeting materiality of sound; and his lecture-performances dazzled crowds throughout Europe. Napoleon was so impressed that he invited Chladni for a private performance at the Tuileries Palace and financed a French translation of the scientist's magnum opus that, in gratitude, was humbly dedicated to the emperor.[40]

Chladni's experiments (and their elaboration in the late 1960s by Hans Jenny) have proven to be a consistent inspiration for sound artists. Carsten Nicolai's *Wellenwanne* (2001), Douglas Henderson's *Untitled 2004* (2004), Seth Cluett's *cloud-to-air* (2013), and other recent projects have used subsonic sound to generate rippling interference patterns in trays of liquid, while Aura Satz's film *Onomatopoeic Alphabet* (2010) elegantly explores such "sound figures" in all their volatile vibration. Alvin Lucier anticipated

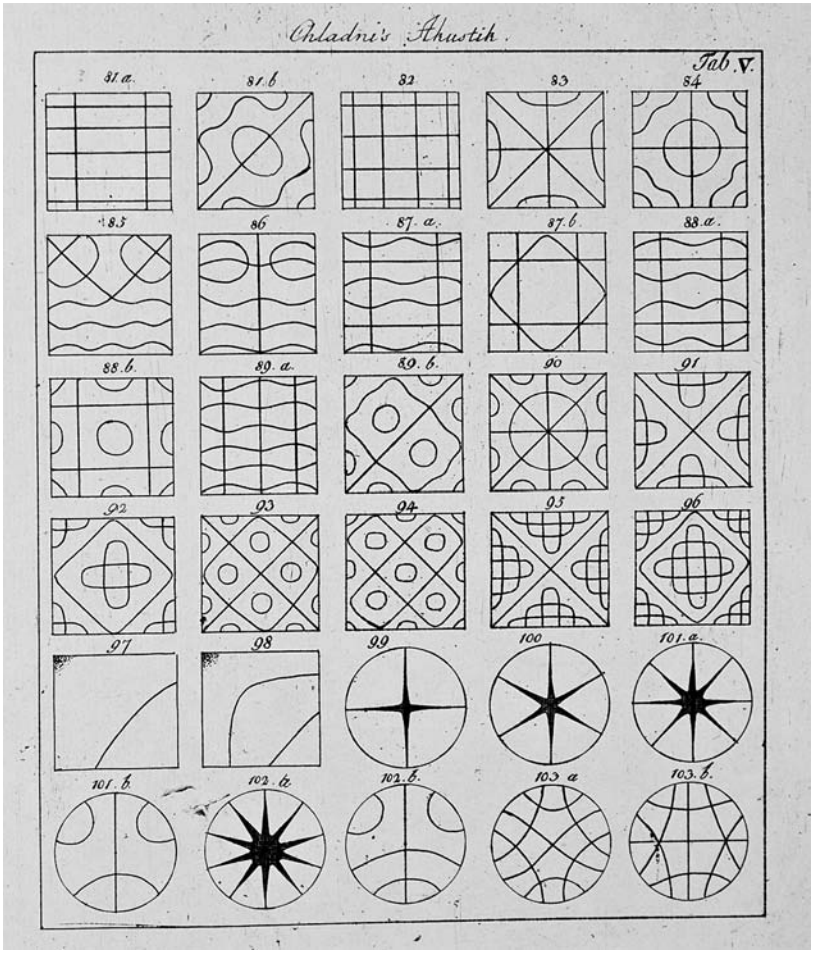


Fig. 6.4 Plate from Ernst Chladni's *Die Akustik*, 1802, showing various *Klangfiguren* (sound figures).

all these projects in the early 1970s with his performance installation *The Queen of the South* (1972), which calls for acoustic and electronic instruments to activate any sort of granular material strewn across a responsive surface, and for the results to be made visible to the audience through a video projection (fig. 6.5). Anxious to avoid *son et lumière*, that is, the mere visual accompaniment to existing music, Lucier instead aimed to explore the powerful materiality of sonic vibration, the capacity of sound to move physical bodies. As such, he encouraged performers to adopt an experimental rather than an illustrative attitude, to draw or sculpt with sound in real

Fig. 6.5 Alvin Lucier performing *The Queen of the South*, 1972, at art/tapes/22, Florence, Italy, 1974. Photo © Gianni Melotti, Gianni Melotti Archives, Florence.

time, "to put sounds into a material and experience the modes of vibration of the sound in that material."[41]

This materialist emphasis on frequency and vibration characterizes the more recent Chladni-inspired projects as well, distinguishing them from earlier efforts at "visual music" that merely drew speculative analogies between music and visual form. Edison's invention of the phonograph played a key intermediary role here. Unlike the musical score, which offers a purely conventional and symbolic depiction of music, the phonograph needle directly carved acoustic vibrations into a pliable material, producing grooves that the needle could retrace and render as sound. In the early 1920s, fully aware of the early "visual music" films of Richter, Eggeling, and Ruttmann, László Moholy-Nagy proposed experimenting with the direct

relationship between the visible grooves carved into a phonograph record and the sounds they produce. Transforming the phonograph record from an instrument of recording and reproduction into an instrument for creative production, Moholy-Nagy urged artists to cut designs directly into the record surface, generating "sound effects"—not only human and animal but "mechanical, metallic, and mineral sounds"—that no longer obeyed the established musical scale but instead established "a new graphic and mechanical scale." Such a tangible, visual object would indeed be a kind of score, Moholy-Nagy noted, but a "groove-manuscript score," a score of frequency and vibration instead of symbolic notation.[42]

Given the microscopic size of the phonograph record's grooves, Moholy-Nagy's project proved difficult to realize. But a few years later he discovered a more feasible means of conjoining the visible and the audible: creative use of the optical soundtrack in the sound film. The newly developed "Tri-Ergon" system (employed by Ruttmann for *Weekend*) recorded sound waves on a thin strip alongside the image track as graphic patterns that, during projection, were converted back into sound by a photoelectric cell. Moholy-Nagy saw in this new technology the possibility of "a true opto-acoustic synthesis," "not merely montage of the optical and acoustic sections, but a mutually integrated montage of both." "We ought to begin with a series of experiments in the sound element," he wrote, suggesting that "sound units" be "traced directly on to the sound track."[43]

Soon a number of artists and scientists—notably Oskar Fischinger, Rudolph Pfenninger, Arseny Avraamov, Evgeny Sholpo, Boris Yankovsky, and Moholy-Nagy himself—began directly intervening at the level of the soundtrack, producing films in which the same graphic material appeared on celluloid as both image and sound. Fischinger had been inspired by Ruttmann to begin making "visual music" films in the early 1920s and at the end of the decade followed Ruttmann in seizing on the sonic possibilities of optical sound.[44] In his Berlin studio he painted sawtooth patterns, stars, dots, ovals, undulating waves, and other designs on paper, then photographed them onto the left side of the filmstrip to produce what he called "sounding ornaments" (*tönende* or *klingende Ornamente*) (adopting the design term "ornament" in order to circumvent the Nazi's ban on "abstract" art; fig. 6.6).[45] Fischinger thus took the optical soundtrack as a device for experimental sonic composition, imagining a "music-painting artist" who goes beyond "mere notes" and instead "bases everything on the primary fundamental of music, namely the wave-vibration or oscillation in and of

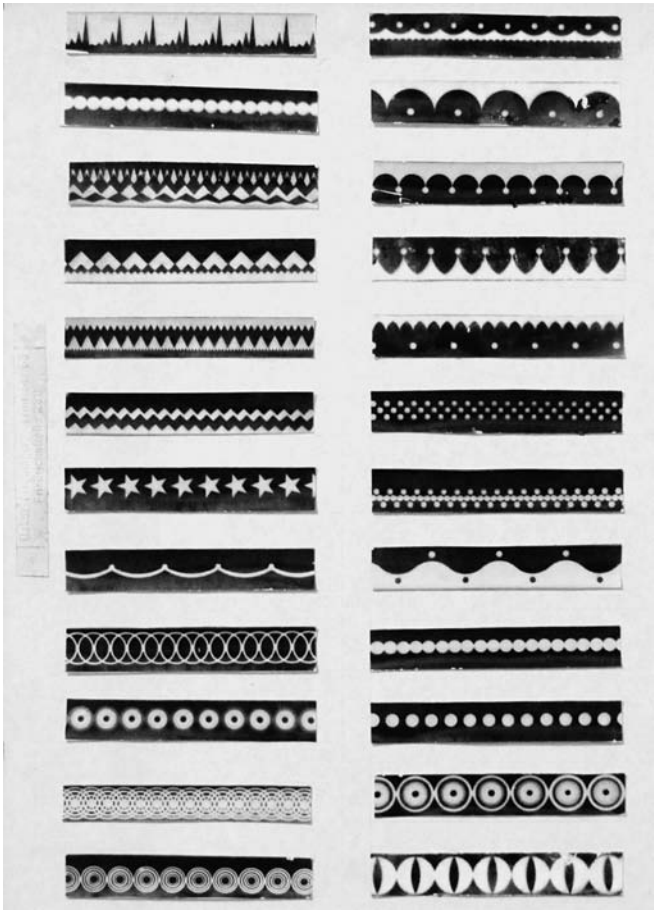


Fig. 6.6 Detail from a display card made by Oskar Fischinger for his *Ornament Sound* experiments, ca. 1931. © Center for Visual Music, www.centerforvisualmusic.org.

itself." Such designs, he remarked, not only "produce refined, intricate musical sounds but also they appear unexpectedly as attractive visual images." Indeed, the filmmaker felt that this mechanical, indexical union of sound and image finally achieved the synaesthetic *Gesamtkunstwerk* he had been striving for. "Between ornament and music persist direct connections," he declared, "which means that ornaments are music. . . . These ornaments are drawn music—they are sound." Given the "combination of sounding ornaments with visible, filmic, spatial forms and movements," he concluded, "the unity of all the arts is definitively, finally achieved, is become unquestionable fact."[46]

Such direct, indexical correlations between image and sound inspired generations of experimental artists. From the 1930s on, the Scottish-born Canadian filmmaker Norman McLaren produced soundtracks by scratching or painting directly on the optical sound strip. Around 1950, following Pfenninger's technique, McLaren and his collaborator Evelyn Lambart built up a catalog of striated cards and photographed them onto the sound strip frame-by-frame, enabling precise control of pitch, volume, and timbre.[47] This process culminated in *Synchromy* (1971), a fugue consisting of three electronic musical parts, the graphic sources of which were choreographed onscreen as animated, multicolored columns. Two years prior, inspired by John Cage and McLaren's earlier work, the American painter and musician Barry Spinello made a film titled *Soundtrack* in which ink-drawn figures and dry-transfer decals occupied both the sound and image portions of clear film leader. Spinello compared the film to the experience of driving on a highway while watching "fences, trees, posts, and the dots and lines of the highway divider" cross one's field of vision. "One imagines what they would sound like if they were passed through the photo-electric cell of the projector," he mused.[48] In the late 1970s the English filmmaker Guy Sherwin began doing just that, filming railway lines, lights, and passing scenery from a moving train (*Soundtrack* [1977], *Night Train* [1979]), tilting the camera up and down in front of a grated metal staircase (*Musical Stairs* [1977]), tracking along an iron railing (*Railings* [1977]), and then printing this visual material on the optical soundtrack to produce sputtering rhythmic oscillations and mechanical tones. Sherwin's London Film-makers Co-op compatriot Lis Rhodes also made direct connections between sound and image. For *Dresden Dynamo* (1971–72) she affixed Letraset and Letratone decals to clear celluloid, creating layered patterns of dots and lines that, extended into the soundtrack field, became audible as a collage of pitched noise and static. Rhodes's film installation *Light Music* (1975; fig. 6.7) employed two projectors facing one another to radiate an assortment of vertical and horizontal bars that generated rumbling pulses and fluttering glissandi.

At the same time, the composer and architect Iannis Xenakis was developing UPIC,[49] a computerized system that could instantaneously render graphic figures as electronic sound. Using an electromagnetic pen and a conductive tablet attached to a mainframe computer, even a noncomposer could produce music by drawing and thus forgo both the graphical limitations of conventional musical notation and the literacy required to interpret it. Today, countless tablet apps and visual programming languages do much

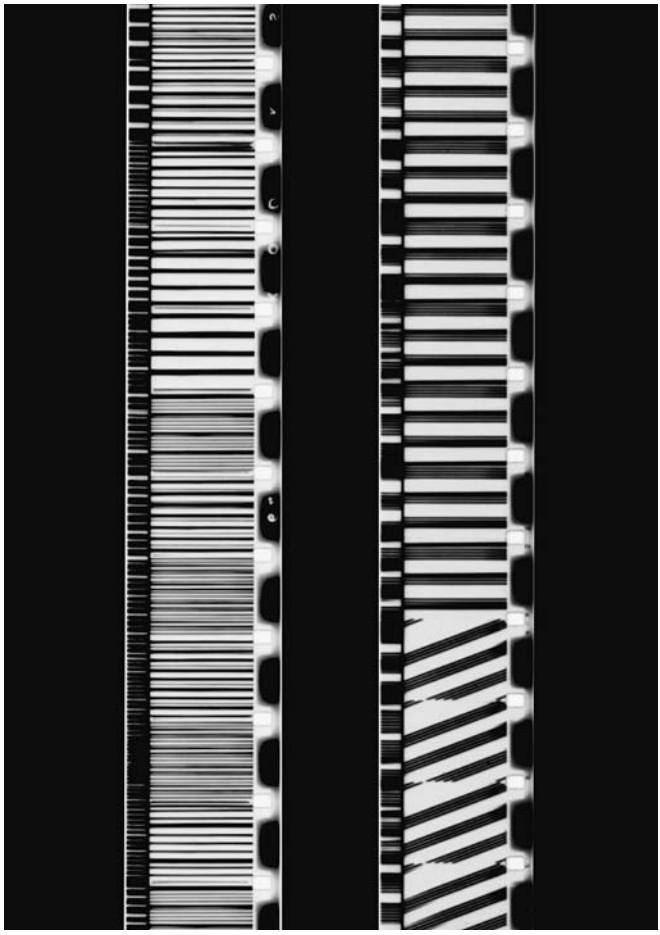


Fig. 6.7 Lis Rhodes, film strips from *Light Music*, 1975, two-channel 16mm film installation, 25 minutes, b&w, sound. Courtesy of the artist.

the same thing. Nonetheless, the retro UPIC has attracted contemporary sound artists such as Russell Haswell and Florian Hecker, who fed the system a variety of images (pornography, disaster photos, scientific images) and produced dense drawings of their own to generate intense noise compositions.[50]

Registering both sound and image as modulations of electronic signals, video promised a relationship between the auditory and the visual that was more direct than that of film. This purely electronic conjunction enabled video art pioneers such as Nam June Paik and Steina and Woody Vasulka to

use sound to alter image and vice versa in real time. Documenting a series of experiments, *Video Power* (1978) employs Steina's amplified violin to warp the video image and change its scan rate. In the Vasulkas's *Noisefields* (1974), the frenetically squelchy electronic soundtrack is controlled by the energy of a pulsing video image. A generation later, the visual artist and electronic music producer Carsten Nicolai drew on these early video experiments to update Chladni for the age of television. Attributed to Nicolai's alias, Noto, *telefunken* (2000; fig. 6.8) was issued as a standard audio CD containing thirty short tracks that, even for lovers of minimalist electronica, are not much to listen to: a collection of impulse frequencies and test tones ranging from a few seconds to a minute long.[51] Yet this is not stand-alone audio. A disc insert instructs the listener to plug the outputs of the CD player into the video and audio inputs of a TV monitor. Played in this configuration, the tracks generate raster patterns that call to mind Ruttmann's *Opus IV* (1925) and Rhodes's *Light Music* while also laying bare the electronic conditions of the video medium. The first twenty pieces produce a spellbinding array of white horizontal bars that rise and fall, merge and part, expand and contract on the television's black ground. The final ten trigger blocks of light that pulse, throb, bend, waver, and hold for a moment before vanishing, as though from an unbearable strain.

Such audio-visual crossovers have become common in contemporary art and music. The projects led by the Austrian video artist Billy Roisz, for example, generate continuous live feedback loops between electronic image and sound. In the duo NotTheSameColor, the turntablist Dieb13 (Dieter Kovačič) sends audio fragments (including video signals recorded onto vinyl) to Roisz, who transforms them into light shards and painterly washes and then returns them to Kovačič for further transformation. AVVA, her collaboration with Toshimaru Nakamura, involves another layer of feedback. Nakamura connects the output of a mixing board to the board's own input, generating a palette of feedback tones that provide the source material for Roisz's video images, which provoke further responses from Nakamura, thus continuing the generative loop.

Whether film, video, music, sculpture, or installation, nearly all this work is presented as "synaesthetic." Echoing Fischinger, Rhodes notes that, in *Dresden Dynamo*, "what you see is what you hear." Likewise, Spinello conceives sound and image as "a single entity"; Sherwin describes his optical sound films as "technological 'synaesthesia'"; Roisz calls her projects "electric synaesthesia"; and Haswell and Hecker maintain that their UPIC compositions

Fig. 6.8 Carsten Nicolai, *telefunken*, 2000, CD player, CD, HiBlack Trinitron TV, dimensions variable. Photo: Atsushi Nakamichi/Nacása & Partners. © 2017 courtesy Galerie EIGEN + ART Leipzig/Berlin, Pace Gallery, and 21st Century Museum of Contemporary Art, Kanazawa, Artist Rights Society (ARS), New York/VG Bild-Kunst, Bonn.

"assist the experience of synaesthesia."[52] The correlations between sound and image at the heart of these projects are surely more direct and less arbitrary than those in so much of the "visual music" tradition. Yet these sound-image correspondences are technological rather than neurological. That is, they happen in the black box of the machine rather than in the brain; and we

merely observe external conjunction rather than experience internal unity. As such, the conjunction differs little from the more speculative analogies of Bute or the iTunes Visualizer. Taken on their own, the graphic ornaments, striations, and Letraset transfers that constitute the soundtracks of these films hardly provoke the spontaneous experience of specific sounds—or, if they do, it is only through prolonged training and practice akin to lip reading or even musical literacy. Those peculiar individuals who can identify particular pieces of music by the sight or touch of phonograph grooves are guests on late-night talk shows and the subjects of amazed news reports rather than ordinary, untrained subjects.[53] And though wave forms abound in the iconography of contemporary visual culture—from GarageBand and SoundCloud graphics to gallery installations by sound artists such as Lawrence Abu Hamdan, Christina Kubisch, and Carsten Nicolai—few of us discern in these forms anything more than a generic symbol of the auditory, a symbol that, in the cultural shift from music to sound, has now supplanted the eighth note in the graphic imagination.

Here we ought to recall Friedrich Nietzsche's remark about Chladni's discovery. Intrigued with the scientist's experiments but wary of their misinterpretation, Nietzsche wrote in an early essay: "One can imagine a man who is totally deaf and has never had a sensation of sound," he wrote. "Perhaps such a person will gaze with astonishment at Chladni's sound figures; perhaps he will discover their causes in the vibrations of the string and will now swear that he must know what men mean by 'sound.'"[54] Wary of the attempt to reduce sound to sight, Nietzsche insists that the visual and the auditory constitute distinct domains and that the relationship between the two can only ever be a matter of translation or metaphor (in the etymological sense of "carrying over") that leaves an unassimilable remainder. For Nietzsche, the distinction between the metaphorical and the literal is simply that the latter no longer acknowledges the difference that constitutes it, taking itself to *be* what it *represents.* Such literalness is a chief characteristic of the aesthetic discourse of synaesthesia today, one that, as Kittler notes, is encouraged by the ready translatability of digital media. The fact that all digital material shares a common base—binary code—supports the illusion that sound, image, word, and movement can be made identical and interchangeable. What is forgotten is that they can be made so only via the intermediary of arbitrary mapping formulae decided in advance. Instead of teaching us something aesthetically or neurologically salient about the operation of the senses, the discourse of synaesthesia blurs their boundaries, obscuring the

specificity of hearing and seeing in order then to submit the auditory to the rule of the visual.

Dubs and Versions

After her forays into optical sound as image, Rhodes turned her attention to language, attempting to discover "the 'sound pictures' of words." Doing so shook her confidence in the unity of sound and image. "These filmic experiments demonstrated the impossibility of making a connection between 'what is said to be seen' and 'what is seen to be said,'" she concluded. "Seeing is never believing, or lip sync a confirmation of authenticity."[55] In films such as *Light Reading* (1978), Rhodes verbally interrogated the image and visually dissolved language into fragments, clips, and stills incapable of coalescing into a genuine or meaningful unity. A few years earlier her LFMC colleague Mike Dunford offered a simpler but equally revealing demonstration of Rhodes's conclusion about the visual voice. In Dunford's 1974 film *SYNC.SND.* (fig. 6.9), a male voice offscreen asks a series of questions about the early history of sound cinema over the noisy whir of a film camera or projector.[56] Onscreen, in extreme close-up, a pair of lips are synced with the voice of a woman who responds matter-of-factly to the interviewer's questions. Question and answer proceed for five minutes, covering developments in film sound from the 1890s through the 1940s, until the screen goes black and the same round of questions begins again. This time, however, the synchronization is several seconds off. For the remainder of the film, sound and image attract and repel one another, occasionally returning to sync but only for a few fleeting instants. The desire for sync sound supersedes the desire for meaning, as the viewer watches and listens not for semantic content but for those consummating moments when sound and image coincide. The materiality of vocal articulation—evident from the beginning in the focus on lips, tongue, teeth, and saliva—is heightened by the nonsynchronized image, which renders the mouth and its movements strange, fleshy, and viscous. Sound and image are revealed as distinct yet equal partners the correlation of which is a technological feat rather than a natural, inexorable occurrence.

For decades now experimental film and video have explored these tensions between sound and image, countering the desire (both commercial and synaesthetic) to draw them together. In different ways, Louise Lawler and Christian Marclay unsettle what in cinematic parlance is called the

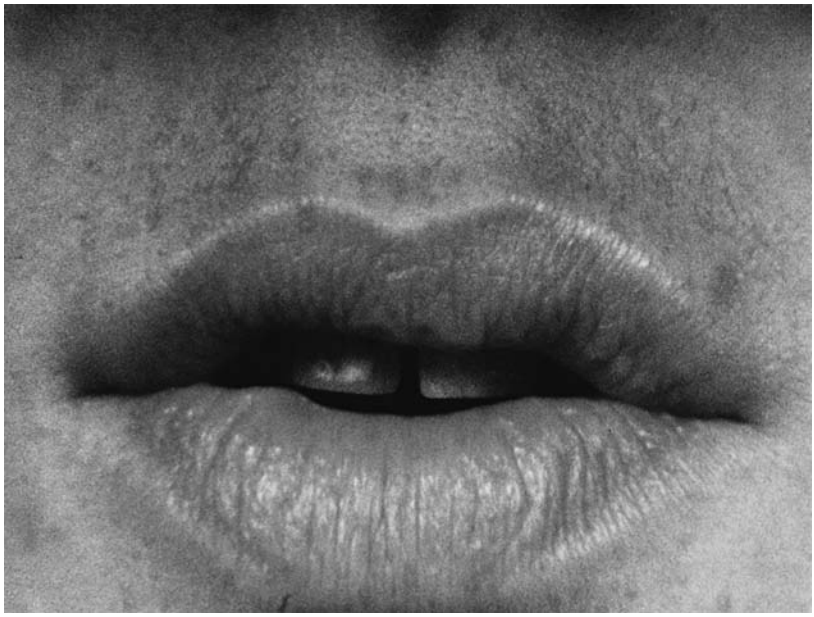


Fig. 6.9 Mike Dunford, *SYNC.SND.*, 1974, 16mm film, 6 minutes, color, sound. Courtesy of the artist.

"marriage" between sound and image demanded by Hollywood film. Recalling Ruttmann's *Weekend*, Lawler's *A Movie Will Be Shown Without the Picture* (1979; fig. 6.10) presents a well-known Hollywood film (*The Misfits* or *Saturday Night Fever*, for example) in an ordinary movie theater but without the image track, thus drawing attention to the soundtrack and the reactions of the audience to it. Marclay's *Up and Out* (1998) pairs the image track of Michelangelo Antonioni's 1966 film *Blow-Up* (which investigates the veracity of the photographic image) with the soundtrack of Brian DePalma's 1981 remake *Blow Out* (which probes the authenticity of recorded sound). Like Dunford's film, Marclay's reveals both the power of cinematic synchresis and the intractable difference and parallelism of these streams, which refuse to converge.

Several other recent projects probe this duality between synchresis and autonomy, the attraction and repulsion between sound and image. Mathias Poledna's silent black-and-white dance film *Version* (2004; fig. 6.11) might be viewed as a latter-day instance of "visual music."[57] Instead, however, the film disarticulates the two terms of that phrase and offers a retrospective critique of the visual music tradition. In what appears to be a single long take, the

Fig. 6.10 Marquee for Louise Lawler, *A Movie Will Be Shown Without the Picture*, 1979, film, variable length, no image, sound. Courtesy of the artist and Metro Pictures, New York.

camera wanders slowly across a group of young men and women dressed in casual clothes and dancing impassively on a partially lit soundstage. The film consists entirely of close-ups and extreme close-ups, capturing only fragments in motion—a hand, a skirt, a torso, a pair of knees or feet. Forgoing any establishing shot and generally avoiding faces, it is difficult to tell just how many dancers there are; and the camera often finds itself in the spaces between bodies, leaving the screen fully black. The film's silence is experienced as a lack, an absence that the viewer struggles to fill. The prevalence of close-ups thwarts even visual rhythm and synchronization. Without any sound to guide the eye and draw the fragments together into a whole, it is not clear that all the dancers are moving to the same music. Occasionally the camera alights briefly on movements that appear to be choreographed—two figures turn and snap fingers in tandem, for example. For the most part, however, the dancers appear as solitary figures absorbed in their own activity.

The film's title gives a clue to its absent musical content while at the same time highlighting the withdrawal of the sonic. In Jamaican DJ culture, a "ver-

Fig. 6.11 Mathias Poledna, *Version*, 2004, 16mm film installation, 10 minutes, b&w, silent. Courtesy of the artist and Richard Telles Fine Art.

sion" is a reggae single with the vocal track removed. Initially, in the late 1960s, such "versions" were issued as instrumental B sides, intended for MCs ("deejays") to improvise ("toast") over at dance-hall events or sound-system parties. Eventually producers such as King Tubby, Errol Thompson, and Lee "Scratch" Perry began to treat the "version" (or "dub") as a musical work in its own right. These versions drastically altered the original tracks, fragmenting the vocals or dropping them out entirely, eliminating the melody instruments in order to foreground a bass line or a hi-hat rhythm, splicing in portions of other tracks, and highlighting studio effects such as echo, delay, and reverb. In short, the version or dub strips away a song's melodic attractions in order to reveal its rhythmic and technological infrastructure. More broadly, a version or dub is a double, a doppelgänger, or a *duppy*, Jamaican patois for a spirit or ghost, a shadowy other that haunts the living.[58]

Poledna's film is a visual version, a flip side or in-version that withdraws sound entirely, leaving only an image that testifies to the indispensability of the soundtrack. Like the forlorn image track itself, the silent dancers appear ghostly, insubstantial, mere apparitions of projected light; and the film itself is but a version or *duppy* in search of the sonic force that animates it. True to its title, *Version* is itself a version. From the same shoot, Poledna

produced another film, *Sufferer's Version* (2004), this time accompanied by the missing soundtrack, which turns out to be "Working Hard for the Rent Man," a reggae single recorded in the late 1970s by Junior Delahaye for the Bronx-based label Wackie's and rereleased in 2003 by the German dub-house imprint Basic Channel. Whereas *Version* is made to run as a loop in a gallery setting, *Sufferer's Version* is for cinematic presentation only and was initially screened by Poledna in a program alongside two other classic black-and-white experimental dance films, Maya Deren's *Meditation on Violence* (1948) and Peter Kubelka's *Adebar* (1957), of which Poledna's two films are clearly versions.[59] Both Deren's and Kubelka's films feature music from ethnographic recordings—Chinese flute and Haitian drumming in Deren's, pygmy flute in Kubelka's—added to the image after the fact, suggesting the detachability and independence of image and sound, the status of both as versions without origin or unity.

In film terminology, "dubbing" names the postproduction process of recording additional sound to supplement, clarify, enliven, or replace sync sound. A key source of such sound is provided by Foley artists, the subject of Julian Rosefeldt's three-channel film installation *The Soundmaker (Trilogy of Failure, Part 1)* (2004; fig. 6.12).[60] In the center screen a man enters an apartment, tosses his keys to the side, takes off his hat and jacket, walks to the bathroom to urinate, sits at a table to eat, reads a magazine on a couch, stares at a TV, and then, for no apparent reason, begins to assemble all his furniture into a makeshift sculptural installation in the center of the room. The camera follows the man's activities, framing him in a medium long shot while tracking left and right in a slow, pendular motion across the space of the apartment. Shot from above and from the front, respectively, the left and right screens display a narrow, cluttered Foley studio, in which the same man dressed in the same clothes calmly attempts to generate in real time all the sounds that ought to accompany the action in the center. Several times during this looped, thirty-five-minute piece, these scenes shift places: the Foley artist appears in the center screen, while on the left and right the camera tracks across the interior walls of the apartment; or the two shots of the Foley studio appear side by side, as the apartment is seen from above by a camera that slowly rotates clockwise. After returning the pieces of furniture to their original locations, the man puts on his hat and coat, grabs his keys, and walks out the door, the camera following him onto a bustling soundstage. On the middle screen a rotating camera cranes up to reveal that the set of the Foley studio shares a wall with the apartment set. On the

Fig. 6.12 Julian Rosefeldt, *The Soundmaker (Trilogy of Failure, Part 1)*, 2004, 35 minutes, three-screen film installation, Super 16mm transferred to DVD, color, sound. Installation at the Royal Academy of Arts, London, 2008. Courtesy of the artist.

left and right screens the camera circles the exterior of the apartment set, passing studio carpenters, lighting technicians, and prop masters along the way, until it arrives once again where it began at the beginning of the film, and the loop starts over again.

The plot of the film is minimal, the activities of the actor by turns ordinary and absurd. Yet, formally, the three screens demand considerable attention and scrutiny on the part of the audience. The Foley artist does a remarkably good job of providing effects for each of the actor's movements but occasionally slips up: footsteps are not quite synced; the sound of a coffee cup placed on a table is delayed; items fall in the Foley studio and make a clatter not matched in the apartment scene; and so on. Images fall out of sync as well, the same scene appearing temporally or spatially staggered on two of the screens. Sometimes the image and sound in the apartment scene are synced, but not with the Foley artist's movements. Only one sound in the film is tightly linked with image—the abrupt shift from the ambient noise of the soundstage to the relative silence of the set (and vice versa), at the beginning and the end of the loop—and that shift is implausible, given

what we see: that the set is fully open to its noisy exterior. Throughout the loop, we struggle to match sound with image, sound with sound, and image with image. True to the installation's title and focus on Foley, sound plays a central role. But it is the image of the soundmaker that gives us the first clues to all the mismatches of sounds and images. Image informs sound and sound image, but in ways that thwart the seamless coincidence celebrated by synaesthesia discourse. Relentlessly striving in Sisyphean cycles and circles, sound and image invariably fail to cohere or coincide.

Like Poledna's, Manon de Boer's film installations frequently center on music, exploring disjunctions between sound and image that amplify the differences between these registers and reveal their respective ontologies. *Presto, Perfect Sound* (2006) produces a seamless audio rendition of the final movement from Bartók's Sonata for Solo Violin by splicing multiple takes made evident by jump cuts in the image track. In *Dissonant* (2010) a dancer carefully listens to a piece of music and then dances to it from memory. Her eight-minute choreography is captured on standard one-hundred-foot rolls of 16mm film that record for less than three minutes. Between rolls of film, the screen goes black, though the dancer's expressive movements are audible throughout. The tour de force in this series is de Boer's 2008 film installation *Two Times 4'33"* (fig. 6.13), the best and most revealing recording of Cage's classic. A camera pans across of the interior of a grand piano, then settles on a pianist who sits down, opens a score on the music rack, presses the button of a timer, and then stares intently at the sheet music without playing. Ambient sound fills the soundtrack. The rumble of accelerating trucks and staccato shriek of car horns are audible from offscreen, as are the rustling trees and the rain visible through the large windows behind the pianist, who taps the timer on and off twice more, marking the beginning and ending of the composition's three movements. When the piece is complete, the pianist stands up and bows to offscreen applause that continues as he leaves the frame and the screen fades to black. As the sounds of applause diminish, the image reappears, the camera once again panning across the piano. But this time it does not come to rest on the pianist, who, as in the first version, sits down and taps the timer. Instead, it continues to pan in a slow circle across the attentive faces of the few dozen young men and women who make up the audience. Leaving the audience, the camera tracks outside the small concert studio, revealing bushes, power lines, and tram cables shaken by strong gusts of wind. Yet no sounds accompany these blustery images or *any* images at all in this second half of the film. The soundtrack is silent,

Fig. 6.13 Manon de Boer, *Two Times 4'33"*, 2008, 35mm film installation, 10 minutes, color, surround sound. © Manon de Boer. Courtesy of Auguste Orts, Brussels

except for the clicks of the timer. In this way, de Boer effectively shifts sonic focus from the ambient sound internal to the film to the ambient sound of the external viewing environment, from the concert studio onscreen to the cinema or gallery in which we watch the film, providing a soundtrack that is new each time the film is shown. The first version is a *recording* of the piece, the second stages a *live performance* of it. The first invites sounds from outside the frame and concert hall, but contains this sound within the space of the film. The second opens out not only beyond the frame and the concert hall, but also beyond the film itself, offering a rigorously Cagean take on "silent" cinema and a deconstruction of "visual music."

Sound Cinema: Film and Video as Sonic Art

Such disjunctions between the auditory and the visual are not the only alternatives to the classic subordination of sound to image or to "synaesthetic" projects that amount to the same thing. Several recent collaborations between filmmakers and sound artists fundamentally affirm the sonic and reveal the capacities of cinema as a form of sonic art. The work of the

Scottish artist Luke Fowler is exemplary here. Since 2001 Fowler has made a series of beguiling films that combine the concerns of structural-materialist cinema with documentary and archival practices. These films often present what the artist calls "portraits" of maverick artists, intellectuals, and ordinary people. Musicians and composers are prominent among his subjects—for example, the elusive post-punk musician Xentos Jones (*The Way Out* [2003]); the experimental composers Cornelius Cardew (*Pilgrimage from Scattered Points* [2006]) and Christian Wolff (*For Christian* [2016]); and the electronic music pioneer Martin Bartlett (*Electro-Pythagoras* [2016])—and Fowler has collaborated with sonic artists such as Richard Youngs, Charles Curtis, Taku Unami, Mark Fell, and Ernst Karel. Fowler's most explicit and sustained engagement with sound is *A Grammar for Listening* (2009), a trilogy of films each made in collaboration with a different sound artist: Lee Patterson, Eric La Casa, and Toshiya Tsunoda. All three artists are prominent practitioners of "field recording," a form of sonic art that, like Fowler's visual practice, combines a documentary impulse with an impulse to employ found material toward more aesthetic and compositional ends. As such, these artists operate between the two poles set out within classic debates around musique concrète: on the one hand, the referentiality and site specificity of recorded sound, and, on the other, the detachability of sound from source and site that enables an engagement with sonic matter itself.

The musique concrète pioneer Pierre Schaeffer was the most vociferous advocate of this latter position, calling for an "acousmatic" or "reduced listening" that would bracket the circumstances of sonic production in order to attend to the "sonorous objects" themselves. Perhaps paradoxically, given Schaeffer's efforts to preclude the visual from sonic apprehension, Fowler's project (initially titled *Ontology of Sound*) was inspired by Schaeffer.[61] From the outset, the filmmaker was guided by a set of central questions:

> To what degree could Schaeffer's "reduced listening" (a concept that seems to be one of the central tenets of field recording) be achieved when "accompanied" by the moving image; would the moving image become superfluous, a mere banality, or could it give sound more depth; could there then be a "reduced viewing," a viewing which renounces the usual secondary status of sound in film, in order to establish an equal footing with that of the image; is there an underlying political and social reality repressed by the field recorder in the act of gathering their exotic sound souvenirs; can the union between sound and image cast light on the fraught ecology of our

present condition? Such inquiries hint at the complex realities underneath the surface of Schaeffer's "pure listening."[62]

In pursuit of these inquiries, Fowler worked to foster a genuinely equal collaboration, inviting each of the sound artists to sites near Glasgow that he thought would engage their sonic sensibilities and following them to locations in their home cities that they believed would excite him. Fowler studied the work of these audio artists and observed them in action, seeking to adapt his image production to the technical, compositional, and aesthetic modalities of his collaborators.[63] At the same time, he was keenly aware of the differences between the capacities of the camera and those of the microphone. "Sound recording and filming often work with phenomena that are quite distinct," Fowler acknowledged,

> the camera being limited to documenting light across surfaces, whilst a microphone could record something that was miles away or a contact mic could transduce the vibrations deep within a surface or object, sounds that would often be imperceptible to the senses. So, though we collaborated, we also trusted one another to find something of equivalent importance . . . which at times was very difficult. But it was also in those times that I found that I was really struggling to "see" something that my interaction with the camera, the place, and the situation would just seem to coalesce.[64]

If portraiture figures prominently in Fowler's work, so does landscape, and his films often shift between the two to explore the material environment in which his subjects live and work.[65] Fowler's collaborators make only the briefest of cameo appearances in the *Grammar* trilogy. Nonetheless, he has described these films as "meta-portraits" of the three artists, all of whom, as field recordists, are dedicated to exploring sonic landscapes or soundscapes.[66] Each film, then, is distinct in its style, form, and content, determined not only by the working methods of its subject but also by the visual and acoustic environment in which he works.

Part 1 (with Lee Patterson) is organized as a sort of primer in elementary acoustics, divided into seven numbered sections with didactic titles such as "Emissions and reflections with structure-borne vibrations" (fig. 6.14). Yet the sounds and images are poetic and mysterious rather than dryly instructive. "Eavesdropping upon events that are both alien yet utterly quotidian," Patterson uses hydrophones, contact mics, and air mics to amplify sound

Fig. 6.14 Luke Fowler, *A Grammar for Listening, Part 2*, 2009, 16mm film, 21 minutes, color, mono optical sound. In collaboration with Eric La Casa. © Luke Fowler and Eric La Casa. Courtesy of the artist and the Modern Institute/Toby Webster, Ltd., Glasgow.

worlds inaudible to the unassisted ear and to capture vibrations traveling through water, metal, concrete, air, and other materials.[67] His soundscape for *Grammar 1* is full of richly textured and exotic sounds drawn from pools of water, metal fence posts and wires, burning walnuts, and vibrating springs. To match Patterson's sonic micro-phony, Fowler filmed predominantly in close-up, lingering on the visible textures of objects and producing a flow of vivid color images, the sources of which are often not evident. In several sequences the camera pulls focus in and out, switching background and foreground in a way that matches Patterson's shifts from, for example, the microphonic domain of underwater creatures to the macroscopic drones of the marshland field. In-camera dissolves and double exposures provide a visual analog to the crossfades and dense layering in the soundtrack. Indeed, throughout the film, Fowler visibly foregrounds the technical intervention that makes possible the film's sound and image

worlds, incorporating fast-motion sequences, light flares, and other such effects. At the same time, the film acknowledges the profound differences between camera and tape recorder—the surface of image and the depth of sound; the sequential cuts in the image track and the layered flow of the audio; the three-minute length of the 16mm film roll and the long durational capacity of the digital recorder. Image and sound adhere loosely to one another not only phenomenologically but also technically. Instead of optically printing Patterson's soundtrack, *Grammar 1* presents it as a separate .wav file that enables a stereo mix and better sound quality. The result is a film composed of two streams that run in parallel, resonant with one another but only loosely synced and resolutely distinct.

In contrast to the measured delicacy of Patterson's soundtrack, with its fluid crossfades, Eric La Casa's sonic composition for *Grammar 2* is dynamic and dramatic, full of sharp attacks that punctuate tense and volatile sonic passages. It too is divided into seven sections or movements marked not with titles but with lushly colored monochrome screens accompanied by silence. Within each movement, these monochromes flash briefly between images, drawing attention to Fowler's edits and amplifying the drama of the soundtrack. The sources of La Casa's sounds are often either identifiable or revealed on screen. Yet he abjures *vérité*-style field recording in favor of auteur composition that affirms the artificiality and artistry of his mix. A bassy rumble with reverberant clatter, voices, and clacking footsteps is abruptly filtered to become a thin rushing drone interrupted by spongy percussive plunks. An incongruous collection of horns and bell sounds (back-up beepers, clanging alarms, and fog horns) play off of one another in the soundtrack as the image cuts between a busy food warehouse and an ominously rippling seascape. Tied tightly to the optical soundtrack, Fowler's editing largely follows La Casa's, producing a montage that accentuates the rhythm of the sound composition, sometimes displaying the (likely) sources of the sounds, other times turning away from them in contrapuntal fashion. Again, Fowler works to densify his images via multiple exposures and to highlight their artificiality with in-camera edits, light flares, fast motion and other techniques. Playing with the modalities of their collaboration, one sequence shows La Casa recording in a dark tunnel to the sound of Fowler's Bolex, which shuts off to end the section. The rattle of the Bolex reemerges in the film's coda, starting and stopping several times as in-camera fades and a final light flare abruptly bring *Part 2* of *A Grammar for Listening* to a close.

Fig. 6.15 Luke Fowler, *A Grammar for Listening Part 3*, 2009, 16mm film, 13 minutes, color, stereo digital sound. In collaboration with Toshiya Tsunoda © Luke Fowler and Toshiya Tsunoda. Courtesy of the artist and the Modern Institute/Toby Webster, Ltd., Glasgow.

The final film in the trilogy is markedly different from its predecessors. Half the length of the others, *Part 3* is a series of long takes centering on two human figures—Fowler's collaborator Toshiya Tsunoda and a woman, Hattie Spires—filmed from behind as they sit motionless beside each other at three locations in London's Hyde Park and Kensington Gardens (fig. 6.15). Attached by a headband to one side of each figure's head is a recording contraption that we later learn, through an onscreen text, is a stethoscope with a built-in air mic. The stethoscope, the text notes, records the vibrations of muscles and the flow of blood through the body, while the air mic gathers sounds from the environment. The right and left channels of the soundtrack are distinctly different. In the right, we hear the muffled drone of city ambience—traffic noise, wind, and distant voices. The left channel is significantly quieter, making audible the faint sounds of breathing and, occasionally, a sloshy gurgle. The film is simple, even banal; but it presses a set of paradoxes: How can one film listening—the titular subject of the trilogy?[68] More specifically, how can the single eye of the camera lens correspond to binaural listening by two different people who produce what Tsunoda calls "a stereo image"?[69] How can the camera image, a mere surface,

capture the interior depths of the subject, the vibrations of which can be registered by the microphone? And, finally, how can either image or sound capture an intentional state—the focus of a subject's attention on a particular object—and, moreover, a double intentionality? The film poses these questions without resolving them. Indeed, its inability or failure to resolve them constitutes the film's success, provoking further inquiries into sound, image, and the possible relationships between the two. Taken as a whole, *A Grammar for Listening* offers a set of experiments that point both to the resonances between sound and image and the limits each encounters in its approach to the other.

An alternative strategy for sound-image interaction has been advanced by artists associated with the Sensory Ethnography Lab (SEL), an audiovisual collaborative at Harvard University managed by the sound artist Ernst Karel, the sound designer for many of the lab's projects and a leading figure in the field recording movement. Since 2007 the SEL has produced a series of extraordinary films, installations, and sound pieces that explode the conventions of documentary form. The most astonishing and radical of these projects is the feature-length avant-documentary *Leviathan* (2012), directed by Lucien Castaing-Taylor and Véréna Paravel and filmed entirely aboard a groundfish trawler off the coast of New Bedford, Massachusetts, a hub of the nineteenth-century whaling industry and still America's most lucrative fishing port. Aptly described as "immersive," the film achieves this effect largely through sonic means. This is due in no small part to Karel's remarkable 5.1 surround-sound mix, which, in contrast to the flat and stationary rectangle of the image, truly engulfs the listener in three dimensions and constantly moves sound among its six channels. Yet even the image track conforms more closely to what Marshall McLuhan has called "acoustic space" than to the "visual space" that typically dominates film and video.[70] Seeing is frontal, requiring distance and light, which enable the subject to perceive the world perspectivally as a bounded field organized by a vanishing point and containing discrete objects set side by side. By contrast, hearing is more proximal, multidirectional, and unbounded. As McLuhan puts it, acoustic space is "multicentered and reverberating," "gyroscopic," "like being inside a sphere, 360 degrees without margins; like swimming underwater; or balancing on a bicycle."[71] *Leviathan* propels the image into this sort of acoustic space. Shot largely at night on a lurching ship via small, low-resolution GoPro cameras attached to the heads, chests, and wrists of the fishermen and mounted onto extension poles, the image is profoundly

Fig. 6.16 Lucien Castaing-Taylor and Véréna Paravel, *Leviathan*, 2012, 35mm and DCP, 87 minutes, color, surround sound.

disorienting.[72] The film opens with the rush of wind and the roar of the ocean over a black screen into which a flare of orange light gradually intrudes in the lower right-hand corner. For the next five minutes shards of color flit across the screen like experimental animation. When this chiaroscuro occasionally reveals an object—a gloved hand, a chain, a hoisted vat—it offers the viewer no clear position or perspective. The middle portion of the film focuses on human subjects in the less turbulent and better-lit cabin of the ship. Even there, however, it tends to presents them in extreme close-up, fixing on a forearm, an eye, or a boot, and providing little bearing in visual space. The camera frequently plunges underwater, jetting through marine debris as through stars in outer space; or it dips above and below the water's frothy surface, tossing with the boat and throwing the horizon into confusion. Detached from the human eye, the camera's mechanical eye spins and twists through an uncertain space. In a marvelous sequence toward the end of film, an inverted camera on a boom pole reveals a flock of gulls flying upside down, the white spray of the ocean appearing above and behind them like clouds, producing an Escher-like visual paradox (fig. 6.16). The white birds blend into the tossing surface of the ocean, becoming abstract flashes of light on a black ground.

The indistinctness of this acoustic space is accentuated by the soundtrack, dominated throughout by a droning amalgam of broadband noises: predominantly, the steady rumble of the ship's engine modulated by howling

Fig. 6.17 Lucien Castaing-Taylor and Véréna Paravel, *Leviathan*, 2012, 35mm and DCP, 87 minutes, color, surround sound.

wind and clamorous surf. Amidst this incessant but heterogeneous and shifting flow, crisply tactile sounds ripple at the surface: aqueous glugs and burbles, clanging chains, the hiss of surf spray, the squeal of a winch. Human speech is scarce and all but drowned in the mix. Rarely intelligible, it always emerges as though piped through a distant radio or intercom, offering affect and intensity rather than meaning.

Indeed, though it documents our technological plunder of the sea, *Leviathan* subsumes human beings within material nature, emphasizing the continuities between the human and the animal, the animate and the inanimate world.[73] The glistening weather gear worn by the fisherman obscures human form, transforming arms and legs into tentacles, hands into claws, and feet into flippers or fins (fig. 6.17). Like the bulging eyes and bloated bodies of the fish that slosh around the ship's hold, the fishermen appear in close-up as hunks of exhausted and sea-soaked flesh, meaty stuff relentlessly under threat of being engulfed by the howling elements that surround them, kin to the slabs of definned flatfish they toss overboard. The soundtrack's drone heightens this foreboding of overwhelming immersion—the noise of wind, sea, and rain reminding us of that immemorial sonic flux that precedes and exceeds the human and indeed all life. "Noise," "nautical," and "nausea," we know, are not only etymologically but sensually related, connections *Leviathan* affirms to the fullest.[74] In the sound of the sea, Leibniz heard this sonic flux, the clear-confused, distinct-obscure roar that allows us dimly

to perceive the connection between our limited perception and the cosmic totality that stretches around us in every spatial and temporal direction, a totality in which we float but that we can never master.[75]

Sound amplifies image, and image illuminates sound. But this is not synaesthesia, not some quirky neurological or arbitrary technological triggering of one sense by another. *Leviathan* relies on and clarifies the distinction between visual and acoustic space, the capacities of the eye and ear, revealing what the image can and cannot do. The film's visual abstraction exposes the flatness of the screen, its image distortions and anomalous camerawork emphasizing the apparatuses of image production. *Leviathan* equally draws attention to the soundtrack and, in doing so, breaks the unitary illusion fostered by ocularcentric cinema, which denies sound any autonomy, requiring instead that it dutifully support the image. If the film reverses this subordination, pulling image into the immersive field of sound, it does so against the tide of dominant cinematic practice, in relationship to which it can only be seen and heard as aberrant.

A Transcendental Exercise of the Faculties

Appealing to the authority of neuroscience and thus, it would seem, to a materialist account of sensation, synaesthetics revives the Wagnerian dream of sensory and aesthetic fusion and the Aristotelian supposition of a common sense that would explain how five distinct sensory channels can result in a unified experience. But, as the ordinary meaning of the phrase suggests, such a "common sense" can only ever apprehend the *doxa*, what "everybody knows" and experiences every day. This is exactly what the Soviet filmmakers worried about at the advent of sync sound: that cinema would recapitulate ordinary perception, generating the naturalistic "'illusion' of talking people, of audible objects, etc."[76] And it is why Nietzsche warned against a facile reading of Chladni's *Klangfiguren*. Common sense enjoins what Gilles Deleuze calls an "empirical exercise of the faculties" that apprehends *what is sensed* but not the *being of the sensible* itself.[77] The latter is revealed only when common sense is confounded and sensation comes up against its limits, when the unity of the subject and the unity of the object are no longer given. Such experiences provoke a "transcendental exercise of the faculties," revealing the limits of each sense and the differences and disparities that provide the very conditions of possibility for ordinary empirical experience. A rigorous materialism, then, would operate not on the empirical level of

common sense, but on this transcendental level, where the faculties are unhinged and one witnesses the differential processes that constitute the world of our everyday experience. Eisenstein and Nietzsche knew that art is the privileged domain in which this sensory experimentation takes place and thus that its metaphysical value is enormous. The films and installations of Poledna, Rosefeldt, the Sensory Ethnography Lab, and others show how much cinema can contribute to this metaphysical project, resisting both the assimilation and the segregation of the senses, instead fostering a collaboration between sound and image that acknowledges the irreducible differences between these media and their sensory modalities while exploring the intensities that these differences can generate.

85. Meillassoux, "Speculative Solution," 3.

86. Meillassoux, *After Finitude*, 71.

87. Meillassoux, *After Finitude*, 69–70. Cf. "Time and Becoming," 103.

88. Meillassoux, *After Finitude*, 70.

89. See Hägglund," "Radical Atheist Materialism," 117–18.

90. See Meillassoux, "Time without Becoming," 96, 100, and *After Finitude*, 36. See also Meillassoux's interview with Harman in Harman, *Quentin Meillassoux*, 165.

91. For a critique along these lines, see Brassier, who concludes: "Far from reconciling rationalism with materialism, the principle of factiality . . . continues to subordinate extra-conceptual reality to a *concept* of absolute contingency." *Nihil Unbound*, 93.

92. See "Think about Nature: A Conversation with Lee Smolin," *Edge.org* (blog), May 14, 2013, http://edge.org/conversation/think-about-nature.

93. See Smolin, "Think about Nature," and *Time Reborn: From the Crisis in Physics to the Future of the Universe* (Boston: Houghton Mifflin Harcourt, 2013).

CHAPTER SIX

1. Kathleen Forde, "What Sound Does a Color Make?," and Judith Olch Richards, foreword to *What Sound Does a Color Make?* (New York: Independent Curators International, 2005), 8, 19.

2. See Aristotle, *On the Soul*, III.1–2, in *A New Aristotle Reader*, ed. J. L. Ackrill (Princeton, NJ: Princeton University Press, 1987), 187–91. For a helpful discussion of this and other passages in Aristotle on common sense, see Daniel Heller-Roazen, *The Inner Touch: Archaeology of a Sensation* (New York: Zone, 2007), chap. III.

3. See Richard Cytowic, *Synesthesia: A Union of the Senses*, 2nd ed. (Cambridge, MA: MIT Press, 2002), 75.

4. See Clement Greenberg, "Modernist Painting," in *Clement Greenberg: The Collected Essays and Criticism*, Vol. 4, *Modernism with a Vengeance* (Chicago: University of Chicago Press, 1993).

5. Dziga Vertov, "We: Variant of a Manifesto," in *Kino-Eye: The Writings of Dziga Vertov*, ed. Annette Michelson, trans. Kevin O'Brien (Berkeley and Los Angeles: University of California Press, 1984), 7. The translator notes that *kinochestvo* is a Vertovian neologism meaning the abstract quality of the cinematic eye.

6. Richard Wagner, "The Art-Work of the Future," in *Richard Wagner's Prose Works*, Vol. I, trans. W. Ashton Ellis (London: Kegan Paul, Trench, Trübner, 1892), 97–98. While more fluid, Emma Warner's recent translation of this text is imprecise, losing Wagner's repetitions and emphases. See Richard Wagner, "The Artwork of the Future," trans. Emma Warner, in "The Artwork of the Future," special issue, *Wagner Journal* (2012): 28.

7. John Locke, *Essay Concerning Human Understanding*, ed. Roger Woolhouse (London: Penguin, 1997), Book IV, §11.

8. See the historical table of publication statistics in Crétien van Campen, "Artistic and Psychological Experiments with Synesthesia," *Leonardo* 32, no. 1 (1999): 11.

9. Charles Baudelaire, "Correspondences," in *Les fleurs du mal*, trans. Richard Howard (Jaffrey, NH: David R. Godine, 1982), 15.

10. Arthur Rimbaud, "Vowels," in *Rimbaud: Complete Works, Selected Letters*, trans. Wallace Fowlie and Seth Whidden (Chicago: University of Chicago Press, 2005), 141.

11. Walter Pater, *The Renaissance* (New York: Modern Library, 1919), 111.

12. Dieter Daniels, "Hybrids of Art, Science, Technology, Perception, Entertain-

ment, and Commerce at the Interface of Sound and Vision," in *See This Sound: Audiovisuology 2, Essays: Histories and Theories of Audiovisual Media and Art*, ed. Dieter Daniels and Sandra Naumann (Cologne: Walther König, 2011), 18.

13. See Peter Vergo, *The Music of Painting* (London: Phaidon, 2010); Standish Lawder, *The Cubist Cinema* (New York: New York University Press, 1975), chap. 3; and Malcolm Cook, "Visual Music in Film, 1921–1924: Richter, Eggeling, Ruttmann," in *Music and Modernism, 1849–1950*, ed. Charlotte de Mille (Newcastle upon Tyne: Cambridge Scholars, 2011), 206–28. See also my "Music, Noise, and Abstraction," in *Inventing Abstraction, 1910–1925*, ed. Leah Dickerman (New York: Museum of Modern Art, 2012), 144–47.

14. Guillaume Apollinaire, quoted in Cook, "Visual Music in Film," 208.

15. Clement Greenberg, "Towards a Newer Laocoon," in *The Collected Essays and Criticism*, Vol. 1, *Perceptions and Judgments, 1939–1944*, ed. John O'Brian (Chicago: University of Chicago Press, 1986), 31.

16. Title texts from Mary Ellen Bute and Ted Nemeth's *Synchromy No. 2* (1936), and Bute, Nemeth, and Melville Webber's *Rhythm in Light* (1934), collected in *Unseen Cinema: Early American Avant-Garde Film, 1894–1941*, Vol. 3, *Light Rhythms, Music and Abstraction* (New York: Anthology Film Archives, 2005), DVD.

17. Title text from Bute, Nemeth, and Webber, *Rhythm in Light*.

18. Fischinger, *An Optical Poem* (1938), collected in *Unseen Cinema: Early American Avant-Garde Film, 1894–1941*, Vol. 7, *Viva la Dance: The Beginnings of Ciné-Dance* (New York: Anthology Film Archives, 2005), DVD.

19. Sergei Eisenstein, Vsevolod Pudovkin, and Grigori Alexandrov, "Statement on Sound," in Eisenstein, *Selected Works*, Vol. 1, *Writings, 1922–1924*, ed. Richard Taylor (Bloomington: Indiana University Press, 1988), 114. In a text begun the same year, László Moholy-Nagy offered a more optimistic assessment of the sound film. Yet, while celebrating its possibilities, he too warned against the naturalistic use of sound and the subordination of sound to image. See "Problems of the Modern Film," in *Moholy-Nagy*, ed. Krisztina Passuth (London: Thames & Hudson, 1985), 314. Revisiting the relationship between image and sound in a 1935 essay, Moholy-Nagy ceded to Eisenstein and his colleagues that "the development of the talking picture has unfortunately verified the gloomiest predictions of the defenders of silent films." "Supplementary Remarks on the Sound and Color Film," in *Moholy-Nagy*, ed. Richard Kostelanetz (New York: Praeger, 1970), 139. In the 1930s Eisenstein turned toward a Symbolist fascination with synaesthesia and the *Gesamtkunstwerk*. (See, for example, "The Synchronization of the Senses," in *The Film Sense*, ed. Jay Leyda [New York: Meridian, 1957], 69–109.) Understanding this turn as provoked by the pressures of Stalinism and the official aesthetic of socialist realism, the American experimental filmmaker Hollis Frampton noted the continued importance of the "Statement," which, he remarked in 1981, "has met with no direct critique or reply in more than a half century." Lamenting "the stagnation of the sound track as an independent and coeval information channel," Frampton suggested that "the deferred dream of the sound film presents itself to be dreamed again." "Film in the House of the Word," in *On the Camera Arts and Consecutive Matters: The Writings of Hollis Frampton*, ed. Bruce Jenkins (Cambridge, MA: MIT Press, 2009), 169.

20. See Denis Hollier, "The Death of Paper, Part Two: Artaud's Sound System," *October* 80 (Spring 1997): 27–37.

21. See Michel Chion, *Audio-Vision: Sound on Screen*, trans. Claudia Gorbman (New York: Columbia University Press, 1994), 143–44.

22. Walter Ruttmann, "Compilation of Excerpts from Interviews and Articles, 1927–1937," booklet insert, *Walther Ruttmann: "Berlin, die Sinfonie der Großstadt"& "Melodie der Welt"* (Munich, Berlin, and Mainz: Edition Filmmuseum, 2008), DVD.

23. Marcel Duchamp, "Apropos of 'Readymades,'" in *Salt Seller: The Writings of Marcel Duchamp*, ed. Michael Sanouillet and Elmer Peterson (Oxford: Oxford University Press, 1973), 141.

24. Carol P. James, "Duchamp's Silent Noise/Music for the Deaf," in *Marcel Duchamp: Artist of the Century*, ed. Rudolf Kuenzli and Francis M. Naumann (Cambridge, MA: MIT Press, 1989), 106–26. See also Seth Kim-Cohen, *In the Blink of an Ear: Toward a Non-Cochlear Sonic Art* (New York: Continuum, 2009).

25. Marcel Duchamp, "Musical Erratum," in *Salt Seller: The Writings of Marcel Duchamp*, ed. Michael Sanouillet and Elmer Peterson (New York: Oxford University Press, 1973), 34.

26. See Martin Heidegger, "The Turning," in *The Question Concerning Technology and Other Essays,* trans. William Lovitt (New York: Harper & Row, 1977), 48; Theodor Adorno, "A Social Critique of Radio Music," in *Radiotext(e)*, ed. Neil Strauss (New York: Semiotext(e), 1993), 272–79; and Max Horkheimer, *Dawn and Decline: Notes 1926–1931 and 1950–1969,* trans. Michael Shaw (New York: Seabury Press, 1978), 162.

27. Pierre Schaeffer, "Acousmatics," in *Audio Culture: Readings in Modern Music*, ed. Christoph Cox and Daniel Warner, rev. ed. (New York: Bloomsbury, 2017), 95–101.

28. See Julia Simner, Catherine Mulvenna , Noam Sagiv, Elias Tsakanikos, Sarah A. Witherby, Christine Fraser, Kirsten Scott, and Jamie Ward, "Synaesthesia: The Prevalence of Atypical Cross-Modal Experiences," *Perception* 35, no. 8 (2006): 1024–33.

29. See Christopher T. Lovelace, "Synesthesia in the Twenty-First Century: Synesthesia's Ascent," in *The Oxford Handbook of Synesthesia*, ed. Julia Simner and Edward Hubbard (Oxford: Oxford University Press, 2013), 409–12, and van Campen, "Artistic and Psychological Experiments with Synesthesia," 11.

30. See Hinderk M. Emrich, Janina Neufeld, and Christopher Sinke, "Synesthesia: A Neurological Phenomenon," in *Audiovisuology I: See This Sound*, ed. Dieter Daniels and Sandra Naumann (Cologne: Walter König, 2010), 418 and the website of the American Synesthesia Association, http://www.synesthesia.info/aboutus.html.

31. For a helpful analysis of the image economy in contemporary culture, see David Joselit, *After Art* (Princeton, NJ: Princeton University Press, 2013).

32. Friedrich Kittler, *Gramophone, Film, Typewriter,* trans. Geoffrey Winthrop-Young and Michael Wutz (Stanford, CA: Stanford University Press, 1999), 1–2.

33. See Sean Day, "Some Demographic and Socio-Cultural Aspects of Synesthesia," in *Synesthesia: Perspectives from Cognitive Neuroscience*, ed. Lynn C. Robertson and Noam Sagiv (Oxford: Oxford University Press, 2005), 11–33, and "Demographic Aspects of Synesthesia," http://www.daysyn.com/Types-of-Syn.html, which reveal that by far the highest incidences of synaesthesia are those in which the concurrent sensation is visual.

34. Chion, *Audio-Vision*, 143.

35. Cretien van Campen, "Reorganizing the Brain," booklet insert, *Optofonica*, LINE 041, 2009, DVD.

36. "Synchresis" (synchronism + synthesis) is a neologism coined by Chion in *Audio-Vision*, 63–64, and *passim*.

37. See Cytowic, *Synesthesia*, 16–17. See also Steven Connor, "Intersensoriality" (2004), http://www.stevenconnor.com/intersensoriality, and Sean A. Day, "Demo-

graphic Aspects of Synesthesia." Though by far the most common type of synaesthesia is colored graphemes (numbers or letters), colored hearing (chromesthesia) is the most common pairing of two senses.

38. Christian Metz, "Aural Objects," in *Film Sound: Theory and Practice,* ed. Elisabeth Weis and John Belton (New York: Columbia University Press, 1985), 154–61.

39. See Chion, *Audio-Vision*, 143ff.

40. See H.-J. Stöckmann, "Chladni Meets Napoleon," *European Physical Journal Special Topics* 145, no. 1 (June 2007): 15–23.

41. Alvin Lucier, "Seeing Sound: *The Queen of the South* (1972) and *Tyndall Orchestrations* (1976)," in *Reflections: Interviews, Scores, Writings, 1965–1994* (Cologne: Musik-Texte, 1995), 138–39.

42. László Moholy-Nagy, "Production–Reproduction: Potentialities of the Phonograph," in Cox and Warner, *Audio Culture,* 481–84. My account here draws from Thomas Y. Levin's history of sound-image relations in early twentieth-century media, "'Tones from Out of Nowhere': Rudolph Pfenninger and the Archaeology of Synthetic Sound," *Grey Room* 12 (Summer 2003): 32–79. Yet in Derridean fashion, Levin advances the thesis that synthetic sound has its origins in writing or the graphic, showing it to be an instance of the arbitrary rather than the indexical sign. This conclusion is strikingly at odds with that of a key source for Levin, Friedrich Kittler, who shows, on the contrary, that synthetic sound (the origins of which lie in phonography) is of the order of the real rather than the symbolic—that phonographic inscription is not that of arbitrary signs but of mathematical-physical frequencies and vibrations. See Kittler, *Gramophone, Film, Typewriter*, 13–17, 22–25, 46ff.

43. Moholy-Nagy, "Problems of the Modern Film," in Passuth, *Moholy-Nagy*, 314. In her discussion of the history of sound film, Vivian Sobchack remarks that "optical sound, or sound-on-film, literally achieved synaesthetic cooperation and bodily union with the film's primary and expressive organs." *The Address of the Eye: A Phenomenology of Film Experience* (Princeton, NJ: Princeton University Press, 1992), 254.

44. See William Moritz, "Non-Objective Film: The Second Generation," in *Film as Film: Formal Experiment in Film, 1910–1975* (London: Arts Council of Great Britain, 1979), 61.

45. See Richard Russett and Cecile Starr, *Experimental Animation: Origins of a New Art*, rev. ed. (New York: Da Capo Press, 1988), 58.

46. Oskar Fischinger, "Sounding Ornaments" (1932), in William Moritz, *Optical Poetry: The Life and Work of Oskar Fischinger* (Bloomington: Indiana University Press, 2004), 179–81. In the early 1970s Moritz compiled Fischinger's fragments into a film titled *Ornament Sound Experiments*, which has been shown at synaesthesia-based exhibitions such as *Sons & lumières* (2004), *Visual Music* (2005), and *See This Sound* (2009). Levin tries to drive a wedge between Fischinger and Pfenninger, arguing that, while the former treated sound as secondary to and a representation of the graphic ornament, the latter reversed this hierarchy and "*destroyed the logic of acoustic indexicality*" ("'Tones from out of Nowhere,'" 57–59). Fischinger's film and writings, partially quoted above, do not support this view; and, in the work of both artists, sound is indexically tied to graphic marks.

47. See Norman McLaren, *Technical Notes* (Montreal: National Film Board of Canada, 2006), 57–58, 61–71.

48. Barry Spinello, "Notes on 'Soundtrack,'" in Russett and Starr, *Experimental Animation*, 176. An earlier version of this text appeared in *Canyon Cinemanews* 69, no. 3

(1969): 11–12, and was reprinted as "Letter from Oakland, California" in Scott MacDonald, *Canyon Cinema: The Life and Times of an Independent Film Distributor* (Berkeley and Los Angeles: University of California Press, 2008), 123–25.

49. The acronym stands for Unité Polyagogique Informatique du CEMAMu, itself an acronym for the Centre d'Études de Mathèmatique et Automatiques Musicales, the research center founded by Xenakis to undertake interdisciplinary research in the arts and sciences.

50. Haswell and Hecker, *Blackest Ever Black*, Warner Classics 2564 64321–2 CD, 2007.

51. Noto, *telefunken*, raster-noton n-r032 CD, 2000.

52. Rhodes in "The Tanks at Tate Modern: Lis Rhodes," a video documentary produced to accompany the installation of *Light Music* at Tate Modern, July 18, 2012–January 20, 2013, http://www.tate.org.uk/whats-on/tate-modern-tanks/display/lis-rhodes-light-music; Barry Spinello, "On Sound and Image as a Single Entity," *Offscreen* 11, nos. 8–9 (September 2007), http://offscreen.com/view/soundforum_3; Sherwin, introduction to the booklet accompanying *Optical Sound Films, 1971–2007*, London: LUX, 2008, DVD; Roisz, notes to "elesyn 15.625," https://vimeo.com/16960417; and Haswell, quoted in Curtis Roads, "Blackest Ever UPIC," liner notes to Haswell and Hecker, *Blackest Ever Black*.

53. Levin describes a few such cases in "'Tones out of Nowhere,'" 70n15.

54. Friedrich Nietzsche, "On Truth and Lies in a Nonmoral Sense," in *Philosophy and Truth: Selections from Nietzsche's Notebooks of the Early 1870s,* ed. and trans. Daniel Breazeale (Atlantic Highlands, NJ: Humanities Press, 1979), 82.

55. Lis Rhodes, "Flashback from a Partisan Filmmaker," *Filmwaves* 6 (Winter 1998–99), reprinted at http://www.luxonline.org.uk/articles/partisan(1).html and cited in Aura Satz's helpful essay "Shapes with the Sound of Their own Making," *Cabinet* 44 (Winter 2011–12): 33–39.

56. Dunford's film bears some similarity to Bruce Nauman's *Lip Sync* (1969), which focuses on the artist's mouth, upside down, repeatedly reciting the title phrase as the sound goes in and out of sync with the image. Nauman's piece owes much to the phasing technique of the composer Steve Reich, whom he had met the year prior and with whom he performed the same year.

57. In an essay on Poledna, Nora M. Alter compares *Version* to Richter's *Rhythmus* series. "Transformations of the Archive," in *After the Digital Divide: German Aesthetic Theory in the Age of New Media*, ed. Lutz Koepnick and Erin McGlothlin (Rochester, NY: Camden House, 2009), 160.

58. On the etymological connection between "dub" and "duppy," see John Corbett, "Brothers from Another Planet: The Space Madness of Lee 'Scratch' Perry, Sun Ra, and George Clinton," in *Extended Play: Sounding Off from John Cage to Dr. Funkenstein* (Durham, NC: Duke University Press, 1994), 20–21.

59. In 2004–6 Poledna screened *Sufferer's Version* alongside Deren's film in programs held at Galerie Meyer Kainer in Vienna, Richard Telles Fine Art in Los Angeles, and the 2006 Whitney Biennial in New York. In 2006 Kubelka's film was added to the program, which was screened at Witte de With in Rotterdam and Galerie Daniel Buchholz in Köln.

60. The three-channel film can be viewed at: http://www.julianrosefeldt.com/film-and-video-works/the-soundmaker-2004.

61. See Schaeffer, "Acousmatics," in Cox and Warner, *Audio Culture*, 97, and Luke

Fowler, "Transitional Words," in *8 Metaphors (Because the Moving Image Is Not a Book)*, ed. Isla Leaver-Yap (London: LUX, 2011), 17–18. On the initial title of the film, see Lee Patterson, "Cross-Collaborations," also in Leaver-Yap, *8 Metaphors*, 18.

62. Fowler, "Transitional Words," 17–18.

63. See Patterson, "Cross-Collaborations," and Fowler, "Sound Cinema: Luke Fowler in Conversation with Christoph Cox," *Ear Room* (September 4, 2011), https://earroom.wordpress.com/2011/09/04/sound-cinema-luke-fowler-in-conversation-with-christoph-cox/.

64. Fowler, in "Sound Cinema."

65. See Ed Halter, "Portrait, Landscape," in *Luke Fowler: "The Poor Stockinger" and Extracts from the Two-Frame Film Archive* [exhibition catalog], Jaffe-Friede Gallery, Hopkins Center for the Arts, Dartmouth College, April 2–May 5, 2013.

66. Fowler, in "Sound Cinema." In *Grammar*, part 3, Tsunoda is on screen for much of the film, though always shot from behind.

67. Lee Patterson, interviewed by Christoph Cox in *8 Metaphors*, 29, and quoted in *framework: afield* (blog) #293, July 18, 2010, http://www.frameworkradio.net/2010/07/293–2010–07–18/.

68. As Marcel Duchamp famously remarked in a note from *The 1914 Box*: "One can look at seeing; one can't hear hearing." Sanouillet and Peterson, *Salt Seller*, 23.

69. Toshiya Tsunoda, interviewed by Christoph Cox in *8 Metaphors*, 34, 35.

70. See Marshall McLuhan, "Visual and Acoustic Space," in McLuhan and Bruce R. Powers, *The Global Village: Transformations in World Life and Media in the Twenty-First Century* (Oxford: Oxford University Press, 1989), 35–47, reprinted in Cox and Warner, *Audio Culture*, 89–94.

71. McLuhan, "Visual and Acoustic Space," 90.

72. Castaing-Taylor and Paravel discuss the equipment and procedures used for *Leviathan* in Scott MacDonald, *Avant-Doc: Intersections of Documentary and Avant-Garde Cinema* (Oxford: Oxford University Press, 2015), 404–10.

73. Castaing-Taylor and Paravel make remarks along these lines in MacDonald, *Avant-Doc*, 408. The cast credits aptly mix the names of the fisherman with the Latin names of the fish species.

74. See Michel Serres, *Genesis*, trans. Geneviève James and James Neilson (Ann Arbor: University of Michigan Press, 1995), 13.

75. On these themes, see chap. 4.

76. Eisenstein et al., "Statement," 258.

77. See Deleuze, *Difference and Repetition*, trans. Paul Patton (New York: Columbia University Press, 1994), 56–57, 139–41, 236. For a helpful explication of this idea, see Daniel W. Smith, "Deleuze's Theory of Sensation: Overcoming the Kantian Duality," in *Essays on Deleuze* (Edinburgh: Edinburgh University Press, 2012), 89–105.