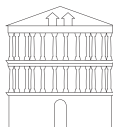


ART OR SOUND

ART OR SOUND

CURATED BY GERMANO CELANT

CA'
CORNER
DELLA
REGINA



Fondazione Prada

In keeping with Fondazione Prada's aim to broaden its cultural scope, the exhibition "Art or Sound" addresses, for the first time, artistic creation that lies on the boundary between the visual arts and sound production, as well as the ways in which these two fields interact.

We began by investigating the Renaissance as it is the origin of a contemporary approach that, by extending its roots into the past, alters its cultural structures and categories. A closer review of what may at first appear secondary—like the decoration of a musical instrument or the suggested resonance of a painting—reconstructs a history, retold in its manifold forms, that demonstrates the ongoing interest in the convergence and exchange of ideas between disciplines.

An object of focus has been the ambiguity that arises out of the relationship between the object and sound, and whether the resulting artifact is considered to have the characteristics—depending on the moment, context and interpretation of the viewer—of a work of art or musical instrument.

In the exhibition at Ca' Corner della Regina, as in this book, art and music are not the only two elements interwoven. There are also notions of light and sound, writing and movement, sculpture and instrument, as well as the work of the artists and craftsmen who have produced hybrid, equivocal objects whose physical presence and sound production simultaneously activate our senses.

An *ensemble* of clocks and carillons, automata and musical machines, paintings and scores, sculptures and readymades, together with decorated, assembled, imaginary and silent musical instruments, transforms this exhibition into an orchestration to be seen, heard and experienced outside any previously established category.

Miuccia Prada and Patrizio Bertelli
Presidents of Fondazione Prada

ACKNOWLEDGMENTS

During the 20th century our understanding of art began to expand to include a multisensory dimension. It was no longer merely a privileged vision, but activated the other senses as well, from hearing to touch, smell and taste. It developed when the historical avant-gardes, from Futurism to Surrealism, attempted to make a creative transition that would embrace the complexity of a perception not monopolized by the eye, but open to all the body's sensory organs. Over the past few decades a wide range of theoretical studies and exhibition proposals have reinforced this opening, yet much remains to be done, especially with regards to sensorial totality.

“Art or Sound” at the Fondazione Prada in Ca' Corner della Regina in Venice is a continuation of these studies and investigations of the linguistic equivalence between artifact and sound, commencing its survey from the origins of this osmosis, an event that has led to the construction of aesthetic hybrids in which reciprocal modes of expression are fused and confused. It is a transition neither univocal nor unidirectional, and shuns all dichotomies in order to propose a complex and multiple perceptive structure within which difference and autonomy are intertwined, but devoid of any hierarchy, so that the sound is not subject to the image and vice versa but rather another identity is established, one that extends beyond polarities.

This sort of exploration, aimed at taking both a historical and a contemporary perspective in order to offer a stereoscopic view of the subject—at once temporal, spatial, visual and musical; and which embraces both the past and the present—could have not been achieved without the sensibility and drive of Miuccia Prada and Patrizio Bertelli, who have supported this project from the outset, enriching it with their own ideas, and have been involved both in the complicated research process conducted in the archives of museums and institutions, as well as in direct contacts with the artists. In order to reach a concrete and philosophical focus on the dialogue and encounter between art and sound, we have attempted to apply a trans-sensory strategy that can avoid discrimination and differences, bringing about real interaction between the different linguistic and cultural dimensions. This consideration, applied to objects and documents, artifacts and instruments, musical scores and performances, was only possible thanks to collaboration from museums, institutions, collections and individuals, all of whom demonstrated extreme generosity and receptiveness in making their knowledge, expertise and time available, as well as allowing us to use iconographic,

digital and documentary materials from their libraries and archives. With this in mind my heartfelt thanks goes to: 303 Gallery (New York); Alanna Heiss Collection (New York); Archivio Maurice Henry (Milan); Corice Arman, The Arman Marital Trust (New York); Bauhaus-Archiv, Museum für Gestaltung (Berlin); Barbara Bertozzi Castelli Collection (New York); Beyer Clock Watch Museum (Zurich); Calder Foundation (New York); Castelli Gallery (New York); Centre Georges Pompidou, Musée National d'Art Moderne (Paris); Eric Ceputis and David W. Williams Collection (Chicago); Cité de la musique – Musée de la musique (Paris); Cittadellarte/ Fondazione Pistoletto (Biella); Collection of Historic Musical Instruments, Kunsthistorisches Museum (Wien); Paula Cooper Gallery (New York); Friedrich Christian Flick Collection, Hamburger Bahnhof (Berlin); FNAC (Paris); Fondazione Bonotto (Molvena); Fondazione Cassa di Risparmio (Bologna); Fondazione Marconi (Milan); Fundación Alumnos47 (Mexico City); Galerie Aanant & Zoo (Berlin); Galerie Chantal Crousel (Paris); Galerie EIGEN + ART (Leipzig/Berlin); Galerie Eva Presenhuber (Zurich); Galerie Xippas (Paris); Galleria Estense (Modena); Galleria Fumagalli (Milan); Galleria Michela Rizzo (Venice); Galleria Gian Enzo Sperone (Lugano); Hahn Collection (Cologne); Hauser & Wirth Gallery (New York); Het Noordbrabants Museum (Hertogenbosch); Kronos Quartet, Kronos Performing Arts Association (San Francisco); Lisson Gallery (London); Los Angeles County Museum (Los Angeles); Luhring Augustine Gallery (New York); Macedonian Museum of Contemporary Art (Thessaloniki); MART – Museo d'Arte Moderna e Contemporanea di Trento e Rovereto (Rovereto); Mitchell-Innes & Nash Gallery (New York); Moderna Museet (Stockholm); Moderner Kunst Stiftung Ludwig Wien (Vienna); Musée d'art contemporain de Lyon (Lyon); Musée des Instruments de Musique, Musées royaux d'Art et d'Histoire (Brussels); Musée historique de la ville de Strasbourg (Strasbourg); Museo di Castelvecchio (Verona); Museo Nazionale degli Strumenti Musicali (Rome); Museum für Kommunikation (Bern); Museum für Musikautomaten (Seewen); Museum Tinguely (Basel); Nouveau Musée National de Monaco (Monaco); Claes Oldenburg and Coosje van Bruggen Collection (New York); On Stellar Rays Gallery (New York); Marie-Madeleine G. Opalka Collection (Venice); Phil Lenihan, Orphic Gallery (Roxbury); Peruz Collection (Milan); Pierogi Gallery (New York); Pinacoteca di Brera (Milan); Prada Collection (Milan); Rheingold Collection (Düsseldorf); di Rosa Collection (Napa); Ruth Marten Collection (New York); Salon 94 Gallery (New York); Scriabin State Museum (Moscow); Seattle Art Museum (Seattle);

Speelklok Museum (Utrecht); Staatliche Museen zu Berlin, Nationalgalerie (Berlin); Sarah Hoe Sterling Collection (Hudson); Robin Sukhadia Collection (Los Angeles); T293 Gallery (Naples/Rome); The Estate of Terry Adkins (New York); The Estate of Dennis Oppenheim (New York); The Estate of Wolf Vostell (Cáceres); The John & Maxine Belger Family Foundation (Kansas City); The Gilbert and Lila Silverman Fluxus Collection, The Museum of Modern Art (New York); The New York Public Library for the Performing Arts (New York); The Ochi Gallery (Ketchum); The Pace Gallery (New York); The Rachofsky Collection (Dallas); The Peggy Guggenheim Collection (Venice); The State Hermitage Museum (St. Petersburg); Rob Tufnell Gallery (London); Vehbi Koç Foundation (Istanbul); Pietro Verardo Collection (Venice); Claire Wesselmann Collection (New York); Max Wigram Gallery (London); Ethan Wiley Collection; Würth Collection (Künzelsau); Zimmerli Art Museum at Rutgers University (New Brunswick); as well as all those lenders who preferred to remain anonymous.

The task of bringing together sound artifacts from the different worlds of music and art could not have been accomplished without the enthusiastic cooperation of artists and their collaborators. I would like to thank them for their constant support and for the efforts they have made in tracking down and lending the fanciful yet functional sound objects they have designed, even though in many cases these are still being used for concerts and performances. Thus our gratitude goes to: Doug Aitken, Terry Allen, William Anastasi, Laurie Anderson, Athanasios Argianas, Tarek Atoui, Ay-o, Marco Bagnoli, Riccardo Beretta, Tore Honoré Bøe, Céleste Boursier-Mougenot, Ken Butler, Janet Cardiff and George Bures Miller, Maurizio Cattelan, Martin Creed, Paul De Marinis, Thomas Demand, Brian Dewan, Ruth Ewan, Neil Feather, Loris Gréaud, Subodh Gupta, Bart Hopkin, Rebecca Horn, Martin Kersels, Walter Kitundu, Milan Knížák, Jannis Kounellis, Bernhard Leitner, Maywa Denki, Walter Marchetti, Christian Marclay, Eliseo Mattiacci, Nicolas Bernier and Martin Messier, Haroon Mirza, Robert Morris, Bruce Nauman, Carsten Nicolai, Claes Oldenburg, Michelangelo Pistoletto, Edward J. Potokar, Pedro Reyes, Manuel Rocha Iturbide, Tom Sachs, Takako Saito, Anri Sala, Andreas Slominski, Akio Suzuki, Alberto Tadiello, Takis, Günther Uecker, Max Vandervorst, Yoshimasa Wada, Guido van der Werve and William T. Wiley.

The publication of a work on the relations between art and sound, viewed from a historical perspective with the aim of deepening people's understanding of their development, could not

have hoped for better contributions than the ones produced by Jo Applin, Luciano Chessa, Christoph Cox, Geeta Dayal, Patrick Feaster, Christoph E. Hänggi, Bart Hopkin, Douglas Kahn, Alan Licht, Andrea Lissoni, Noel Lobley, Deirdre Loughridge, Simone Menegoi, Holly Rogers, Jonathan Sterne, David Toop, John Tresch, Eric de Visscher and Rob Young, who have extended and expanded our comprehension of the subject through their investigations of the theme and historical period spanned by “Art or Sound.”

For display and graphic design, my gratitude goes to Michael Rock and the 2x4 studio in New York, who paid careful attention to the complexity of staging an exhibition in a building dating from the 18th century and relied on a thorough understanding of the relationship between art and music to create, with the help of Sungjoong Kim with Ryan Brooke Thomas and Jessica Dobkin, a well-organized and unprecedented architectural setting and presentation that enhances both visual and aural perception of the works. 2x4 also developed a surprising, engaging design for the publication, relying on constant and inventive collaboration from Liliana Palau Balada.

I also wish to thank Frédéric Sanchez, who paid careful attention to the relationship between space and sound that characterizes the show.

For coordination of Fondazione Prada’s curatorial and operational teams in Milan and Venice, as well as for the professionalism with which she has overseen different aspects of staging the exhibition, I am grateful to Astrid Welter. The meticulous and detailed research conducted by Chiara Costa and Mario Mainetti has given the exhibition and the publication their form and structure. The sensitivity and accuracy shown in the design and realization of the display system was achieved thanks to Alessia Salerno, whose experience helped bring the operation to a successful conclusion. The decisive contributions made by all of these people has been supported by constant work and effort from the institution’s staff members, including invaluable technical and professional contributions from Andrea Goffo for press relations; indispensable professional participation by Paola Magnanini; and intense and diversified assistance in dealing with organizational problems provided by Beatrice Boatto, Antonio Cascone, Francesca Cattoi, Camilla Finzi, Niccolò Gravina, Daniele Manfrè, Cornelia Mattiacci and Carlotta Predosin.

At Ca’ Corner della Regina in Venice, the Fondazione Prada was able to rely on necessary technical and professional assistance from Maurizio Ciabatti, Giuseppe Zotti, Roberto Rigon and Romeo Scarpa. Mounting and displaying these precious works

was made possible thanks to help from the Attitudine Forma team (Turin), as well as the conservation and restoration expertise of Luisa Mensi.

With regard to the publication, where knowhow and precision play such a vital role, we are grateful to the Buysschaert&Malerba studio, made up of Francesca Malerba, Laura Magda Barazza, Giacomo Serra, Zino Malerba, Aaron Maines and Timothy Stroud, for its constant input, dedication and concentration.

It would have been impossible to deal with the great number of requests for information, coordinating them with respect to the curator's schedule, without the patience and determination of Marcella Ferrari at Studio Celant, assisted in her research by Laura Conconi and Mattia Ruffolo, including valuable support provided by Lorraine Dolot and Shirley Queiroz. Finally, I would like to thank Argento and Paris Celant who, with the greatest intensity, have been a constant presence at my side throughout this adventure.

Thanks to everyone

Germano Celant
Director Fondazione Prada

ART OR SOUND

FONDAZIONE PRADA
Ca' Corner della Regina, Venice
7 June – 3 November 2014

EXHIBITION

CURATOR
Germano Celant

ASSOCIATE CURATOR
Mario Mainetti

RESEARCH
Chiara Costa
Mario Mainetti
with
Niccolò Gravina

PROJECT DIRECTOR
Astrid Welter

PROJECT MANAGER
Alessia Salerno

ORGANIZATION
Camilla Finzi
Daniele Manfrè
Carlotta Predosin
with
Cornelia Mattiacci

EXHIBITION DESIGN
AND GRAPHIC DESIGN
2x4, New York
Michael Rock
Sungjoong Kim
Ryan Brooke Thomas
Jessica Dobkin
Ryan Weafer
Jaewon Seok
Minsun Eo

INSTALLATION
Alessia Salerno
with
Giuseppe Zotti

INSTALLATION
CONSULTANTS
Attitudine Forma, Turin

VIDEO PRODUCTION
Show Biz, Milan

CONSERVATOR
Luisa Mensi
with
Matilde Dolcetti

PRESS OFFICE
Andrea Goffo
with
Beatrice Boatto

ADMINISTRATION
Paola Magnanini
with
Antonio Cascone

EDUCATIONAL ACTIVITIES
& GUIDED TOURS
CoopCulture, Venice

SHIPPING
Apice Srl, Milan
Rubelli & C., Venice

INSURANCE
AXA Art Versicherung AG,
Milan
Marsh, Milan

CONSTRUCTION
MANAGEMENT
Maurizio Ciabatti
Roberto Rigon
Alessia Salerno
Romeo Scarpa

CONSTRUCTION
Augusto Capovilla Sas, Venice
Adriano Cincotto, Venice
Cantù Arreda Srl, Cantù
Contec Ingegneria, Verona
Esa Engineering Srl, Florence
Gemini luci, San Giuliano
Milanese
Grifal Spa, Cologno al Serio
Gruppo Fallani, Venice
Gruppo Restauro Conservativo,
Venice
Impresa costruzioni e
restauri edili BCB, San
Donà di Piave
Maser Group, San Donà di
Piave
Openservice, Venice
Star Service Srl, Cernusco sul
Naviglio
Tono Impianti Srl, Padua
Tramonte Elettroimpianti
Engineering, Campagna
Lupia
Zero4Uno Ingegneria Srl,
Venice

THANKS TO
Bose Spa, Milan
Contec Ingegneria, Verona

SPECIAL THANKS TO
Frédéric Sanchez

BOOK

GENERAL EDITOR
Germano Celant

ASSOCIATE EDITOR
Chiara Costa

RESEARCH
Chiara Costa
Mario Mainetti
with
Niccolò Gravina

DESIGN
2x4, New York
Michael Rock
Sungjoong Kim
Liliana Palau Balada

PRODUCTION EDITOR
Buysschaert & Malerba, Milan
Francesca Malerba
Laura Magda Barazza
Giacomo Serra
Aaron Maines
Zino Malerba

TRANSLATIONS
Buysschaert & Malerba, Milan
Ilaria Ortolina
Antonella Santambrogio
Cristiana Spitali
Timothy Stroud
Language Consulting
Congressi srl
Anna Albano
Robert Burns
Christopher Evans
Marina Scotto di Carlo

PRODUCTION
COORDINATION
Marco Previtali
Mara Spinelli

PUBLISHER
Progetto Prada Arte, Milan

REPRO
De Pedrini, Milan

PRINTER
Nava Milano Spa

THANKS TO
Beatrice Boatto
Francesca Cattoi
Andrea Goffo
Daniele Manfrè
Cornelia Mattiacci
Carlotta Predosin
and
Studio Celant
Laura Conconi
Marcella Ferrari
Mattia Ruffolo

© 2014 Fondazione Prada, Milan

© For their texts:
Jo Applin
Germano Celant
Luciano Chessa
Christoph Cox
Geeta Dayal
Patrick Feaster
Christoph E. Hänggi
Bart Hopkin
Douglas Kahn
Alan Licht
Andrea Lissoni
Noel Lobley
Deirdre Loughridge
Simone Menegoi
Holly Rogers
Jonathan Sterne
David Toop
John Tresch
Eric de Visscher
Rob Young

© Cover image:
Tenor cornett in the form of
a serpent with a dragon head,
17th century
Musée de la musique –
Cité de la musique, Paris

ISBN: 978-88-87029-56-7

No part of this book may be
copied or transmitted in any
form or by any electronic,
mechanical or other means
without the permission of the
authors and the publisher.

TABLE OF CONTENTS

NOTE TO THE READER

This volume reconstructs and analyzes the relationship between investigation and experimentation in the fields of art, sound and music from the Renaissance through modern day.

In addition to a text by the curator, the volume contains essays by scholars, musicologists, theorists, artists, musicians, composers and art historians who conduct historical, critical, philosophical, technical and sociological surveys on the subject.

The essays are divided by sections with illustrations (complete with brief descriptive texts) that provide an exhaustive account of the exhibition "Art or Sound" by Fondazione Prada, curated by Germano Celant at Ca' Corner della Regina in Venice. Exhibited works (including musical instruments, mechanical objects, scores, paintings, sculptures, assemblages, installations and electronic devices) have been realized by artisans, craftsmen, artists, composers and musicians during the period stretching from 1520 to 2014.

All illustrated works (or the related authors/makers) mentioned in the essays are accompanied by a reference page number.

Presented in chronological order, each illustration is accompanied by a text describing the work and including author's/maker's name (when known), title, year (execution or production date; in case of reconstruction or replica the date is in parenthesis) and synthetic biographical or historic information on the author/maker (artisan or company, artist, composer or musician). Some of the texts refer to more than one image.

The works are described with regard to their relevant technical and artistic characteristics, and their relation to sound.

Information is based on historical documents, specialized publications, audio-visual documentation and cross disciplinary dialogue as part of the Art or Sound project, conducted with artists, scholars, archivists and other experts in museums, foundations and galleries.

The artist and musician citations included in this volume indicate bibliographic sources, except in those cases where oral testimony was gathered during the project's research phase.

The works mentioned in the text and followed by the abbreviation [exh.] are on exhibit but not illustrated in the book.

Further detailed information (media, dimensions, collections) can be found in the List of exhibited and illustrated works (p. 440).

- | | |
|-----|--|
| 17 | GERMANO CELANT Art or Sound: From the Multilingual to the Multisensory |
| 29 | DEIRDRE LOUGHRIDGE Marvelous Illusions: Visual and Musical Beauty from the Renaissance through the 18th Century |
| 33 | CHRISTOPH E. HÄNGGI Sound, Music, Time and Movement: Antique Mechanical Music Machines |
| 40 | ART OR SOUND From 1520 to c. 1800 |
| 81 | PATRICK FEASTER On Sound-Graphs: A Coordinated Look at Sonic Artifacts |
| 87 | JOHN TRESCH The Archaic Elsewhere of Skies: Thermodynamics and Electricity, Pantheism and Void |
| 93 | CHRISTOPH COX Seeing is Not Hearing: Synaesthesia, Anaesthesia and the Audio-Visual |
| 100 | ART OR SOUND From Early 19th Century to 1911 |
| 139 | DOUGLAS KAHN Revelation of Hidden Noises: Improbable Musical Instruments and Sound Devices in Early 20th-Century Literature |
| 147 | LUCIANO CHESSA A Metaphysical Orchestra: Researching and Reconstructing the Intonarumori |
| 153 | ROB YOUNG So Rudely Forced: the Postwar Turn from Music to Sound |

| | | | |
|-----|--|-----|--|
| 160 | ART OR SOUND From 1913 to 1952 | 338 | ART OR SOUND From 1994 to 2005 |
| 195 | ERIC DE VISSCHER Silence as a Musical Sculpture: John Cage and the Instruments in 4'33" | 383 | HOLLY ROGERS Twisted Synaesthesia: Music Video and the Visual Arts |
| 201 | GEETA DAYAL Experimental Music and Performance: David Tudor, John Cage and Merce Cunningham | 389 | ANDREA LISSONI The Importance of Unpredictability: Unexpected Dialogues in Sound Works |
| 207 | JO APPLIN Optical Noise: The Sound of Sculpture in the 1960s | 393 | JONATHAN STERNE The Magic in Instruments: Music Technologies and Commodity Fetishism |
| 214 | ART OR SOUND From 1958 to 1968 | 400 | ART OR SOUND From 2006 to 2014 |
| 255 | ALAN LICHT The Noise of Surface: Making Art Audible in the 20th Century | 438 | APPENDIX |
| 261 | SIMONE MENEGOI Sound Art? Visual Arts and Sound at the Turn of the 1970s–1980s | 440 | List of exhibited and illustrated works |
| 270 | ART OR SOUND From 1970 to 1992 | 449 | Selected bibliography |
| 319 | DAVID TOOP Instruments of Non-Existence (Through Which Heaven and Earth Seek Reconciliation) | 458 | Italian translations |
| 325 | BART HOPKIN Types and One-of-a-Kinds: How Musical Instruments Function Socially and Aesthetically | | |
| 331 | NOEL LOBLEY Animating Ethnographic Objects: Everyday and Extraordinary Musical Instruments | | |

JOHN TRESCH

THE ARCHAIC ELSEWHERE OF SKIES

**THERMODYNAMICS AND ELECTRICITY,
PANTHEISM AND VOID**

“One might call it a din, a roar, a clamor, a hammering, a great shriek, a bellow of the gods, but noise is a simple word that serves just as well to describe what has no name.”

Roberto Bolaño, *2666*¹

CAPTURED SENSE

The “Art or Sound” exhibition walks us past objects we hear: devices that produce, transform or bury sound within them. These objects lead us to puzzle, across the centuries caught here, at the variable positionings of the seeable and the audible, and at the instruments that merge, exchange, juxtapose and decouple them.

The musical sculpture captures and converts. In it something is harnessed, held, transformed, redirected. Just as instruments capture air, movement, and the vibration of a sound, they can also capture the eye, hold the glance, rewarding it with a harmony, an intricacy, a reason to linger, a trap: two centuries of bird cages.

In wood and string instruments, the breath and motion (and skill and emotion) of the player are received, shaped and amplified: the action comes from without, from the human who plays. These contrast with automata, objects that move themselves. The difference between an *instrument* and a *machine* was a recurring 19th-century question, though many denied any essential divide: a skillfully played instrument appears to play itself, while the valves and pistons of tools of all sorts, including woodwinds and brasses from the 19th century onward, fold many simple machines into a single device.²

The visual forms of musical objects, as much as the sounds they emit, raise the question of the sources of action: who is in control, and through what means? Musical automata especially lead us to ask: who has wound the spring, stoked the furnace, patterned the circuits, flipped the switch? Such puzzles hover over the Aeolian harp, a stringed object—simple in principle, but frequently beautifully elaborated—played by the wind.

Coleridge’s poem *The Aeolian Harp* used this instrument for a stealthy metaphysical provocation.³ At sunset, the narrator and his wife sit wreathed by flowers, hearing the “soft floating witchery” from “that simplest Lute:” “a light in sound, a sound-like power in light.” The poet is seized by the thought of a single substance uniting the universe, and dares to wonder “what if all of animated nature/ be but organic Harps diversely framed,” caressed and animated by an “intellectual breeze” that is both God and soul. Then the speculative window snaps shut: his wife glances at him with “mild reproof,” reminds him “to walk humbly with [his] God.”⁴

THE ARCHAIC ELSEWHERE OF SKIES

The poet dutifully relinquishes his fantasies, yet it’s hard not to suspect that the true prize of the poem, its beating heart and the source of fascination, is precisely the forbidden pantheist reverie, framed by the innocent proprieties of Christian and domestic dualism, at its center.

Coleridge’s poem established a recurring link between innovative instruments, synaesthesia, and a metaphysical temptation. Behind the lure of synaesthesia, which merged senses, stood cosmological possibilities that merged matter, mind and elusive sources of activity. Synaesthetic instruments were a gateway drug to pantheism. Though such conjectures picked up on perennial debates, they gathered historical force in the 19th century, thanks to technological assemblages that unleashed unprecedented forces.⁵

CYMBAL, CYLINDER, CYGNE

Musicologists like to say that at the start of the 19th century Europeans heard two kinds of man-made sounds louder than any heard before: explosions in the Napoleonic Wars and Beethoven’s symphonies. True or not, the anecdote points to a rupture and a connection, terrifying and sublime, between new technologies of destruction and creation. The disarming equation between strategically deployed artillery and the orchestra’s technological assembly was frequently noted, with composers and conductors positioned as generals, ranked instruments as troops, symphonies as campaigns. Ludwig van Beethoven’s *Eroica* (1802–04) symphony was inspired by Napoleon; his *Wellingtons Sieg* (1813) was composed not only to commemorate Waterloo, but as a proof-of concept for a new, gigantic orchestral automaton, with pounding drums, blaring fanfares, booming wind-up drums and crashing cymbals.⁶

The Panharmonicon for which Beethoven composed was designed by the same Johann Nepomuk Maelzel who invented the metronome, an artificial larynx, and toured with a chess-playing automaton. Though 18th-century automata were figures of bourgeois self-control, by the early 19th century many humans experienced such machines as rivals and an invasion: they provoked a creeping recognition of impersonal forces overtaking individuality.⁷ Thundering in the background, too, they heard the clanging of mass-produced tools and weapons, soon joined by the groan and clatter of steam engines driving mills, presses and locomotives.

Overwhelming auditory experiences were matched by staggering visual experiences in the panoramas, which frequently used as subjects battles scenes and vertiginous views from towers and mountains, as well as the visual culture they spawned: whether enormous and confrontational historical paintings, or dazzling, shape-shifting backdrops for the theater and the opera. The railway journey produced a “panoramic vision” in which foreground details evanesced into a slowly shifting background, as well as disorienting shock through the train’s violent commotions.⁸ Battles, panoramas, steam engines and orchestras all involved sounds, sights, and concussions too powerful, vast or dynamic to grasp at once: they threatened to overtake, devour, encompass the body and mind of those who experienced them, to rubble the boundaries that kept humans separate from their surroundings.

Helmut Müller-Sievers has recently reframed 19th-century science, technology and arts through reference to a single geometric form, the cylinder, and the motions it made possible. The challenges posed by the steam engine were not limited to retaining heat and power—a capacity increased by James Watt’s introduction of a second cylinder or condenser to the engine’s primary piston—but translating rectilinear motion into circular motion and vice versa.⁹ As motors, containers and tools (including the drums used to record physiological processes) cylinders ensured both the fixed order and the open progress demanded for consumption and creation. The cylinder was also an elemental form (however mutated) for new additions to the audio-visual arsenal: the brass tubes stretched and twisted by Adolphe Sax [110, 112] and Ludwig Embach [76], the voice-amplifiers for Giacomo Meyerbeer’s demon chorus below the stage in Meyerbeer’s *Robert le diable* (1831), opera glasses and panoramas themselves. It provided the logic for the senses’ assembly and deployment over time: the unfurling of the moving panorama matched the sequence of the railway journey, music box and player-piano, the unrolling of the symphonic score.

An intriguing double movement appeared in studies of the physiology of the senses: the senses were separated in order to be later rejoined.¹⁰ On the side of separation, Johannes Müller and Charles Bell argued that the nerves that carried auditory and visual signals were distinct, and that specific nerve energies applied to each.

The laboratory apparatus of Laplacean mathematical experimental physics was used by Félix Savart and Jean-Baptiste Biot to capture the distinct regularities of optical and acoustic phenomena, building mechanical replicas of both eyes and ears. Attempts to measure the speed of sound and light were undertaken with support from the scientific popularizer François Arago, a contributor to Alexander von Humboldt’s cosmic and esthetic science of the earth and skies. To measure sound, a cannon was fired at the same time as a visual signal was raised: observers at a known distance measured the time it took to hear the explosion after seeing the sign. To measure the speed of light, Arago directed Léon Foucault and Hippolyte Fizeau to build a system of swiftly rotating mirrors that would cause a light beam to travel a vast distance in a contained space; the swiftly rotating mechanism was borrowed from a church organ’s device for regulating the flow of air into pipes.

Yet profound analogies were seen to unite sound with light and the other “imponderable” fluids studied by physicists: some physicists assumed they were all susceptible to identical mathematical treatments, and others pressed for proofs of an underlying physical unity, seeing them as vibrations in a pervasive ether or as modifications of a fundamental force or power. Such theories were endorsed and enacted in romantic and fantastic arts, where the unity of senses suggested deeper metaphysical unity: Johann Wolfgang von Goethe’s emotional and musical analysis of colors harmonized with his Spinozist nature; Charles Baudelaire programmatically announced his “Correspondences” (1857). The equivalence and interconversion between senses was an artistic goal and a critical common ground: painting by sound, the music of colors.

The mixture of senses suggested a mixture of essences; synaesthesia often surged forth as a first step to the assertion of a mystic unity between mind and nature—a vitalist monism or a pantheism. Both were responses to upheavals in the distribution of the sensible, a new technological sensorium in which analytic boundaries were relentlessly traced and relentlessly surpassed.¹¹ Synaesthesia resonated simultaneously with philosophical pantheism and the scientific and technological developments of the early 19th century: steam engines, electric networks, mass media.

This combination also produced new social visions. Followers of Charles Fourier propounded the analogies among the senses and the combinations made possible by the “keyboard of personalities;” new moons, new continents, new creatures and bodies would appear through the harmonic organization of labor. Saint-Simonianism, a religion invented by engineers for the spread of industry, combined conversions of steam, electricity, labor and the senses. The equivalence of heat and work in the steam engine was repeated in their view of a cosmic equivalence between mind and matter—two aspects of God. Thermodynamics, pantheism and synaesthesia went hand in hand.

In 1832, a Saint-Simonian denounced contemporary Paris as “a great satanic dance” of visual and auditory dissonance: the scientists of the Latin Quarter were face-to-face with the “howling animals” of the Jardin des Plantes; orphans screaming in the children’s hospital disturbed astronomers at the Observatory. In “The New City of the Saint-Simonians,” labor, knowledge, trade and pleasure would be first separated and then united in a single plan, distributed across the city, which would take the form of a man. Science filled his left side, where a university’s giant pyramid and shining buildings “climb to the sky in crystals of light;” industry took the right, with “cylindrical chimneys opening jaws filled with flames,” to “the rhythm of hammer blows and axes.”

Between the man’s legs lay buildings “consecrated to the ecstasies of the mind and the delirium of the senses,” including “operas and theaters with their apparatus of instruments, costumes and décors.” Separating functions between thought, action and feeling was a first step to their harmonious merger. At the head of this “new colossus,” on the île de la Cité, was a new temple in the shape of giant woman. Staircases spiraled up her sides, like jeweled belts and garlands; music poured from an organ at her breast; behind her, the train of her dress was draped over an amphitheater. This hi-tech, synaesthetic fetish converted all the forces of nature into a melodious, striking device to unify humanity, its works, and the multifarious energies of a divinized nature.¹²

The Saint-Simonians’ pantheist vision of a technologically improved and harmonized city was a key source for Georges Eugène Haussmann’s transformation of Paris in the 1850s and 1860s. Napoleon III’s remodeling, however, seemed to leave no place for quieter, more intimate harmonies. Like Victor Hugo, Baudelaire saw himself as an exile from this changed urban landscape, its scaffolds, clanging tools, clattering carriages and pavements. In *Le Cygne* (The Swan, 1861) he forged an allegorical bond between himself and a starving, desperate swan, escaped from a menagerie, that he saw walking near the Tuileries: “in the forest where his spirit is exiled”¹³ he hears the notes of a horn play, recalling all others who are lost, away from home. The symbolic fusion of sound, sight and sense in this *cygne*/sign comes at the cost of the poet’s expulsion from his surroundings. Sense and meaning are emphasized, while matter drops away, handed over to “modern fatuity.”¹⁴

Baudelaire’s phonetic capture of the eternal in the fleeting and of the heroism specific to the modern era resonated through the arts to come. Curious paradox: visions of a unity of sense, action and technique in the 1830s and 1840s had been shared among engineers, scientists, poets and artists—whom Saint-Simon baptized the “avant-garde.” Yet in the second half of the century, many of the mystic aspirations of reformers were realized as merely material (and frequently exploitative) attainments. In response, artists redefined themselves and their domain, in many cases, as an escape—though a doomed one—to a realm of memory, sense, emotion and imagination alone. Baudelaire was the beacon for this shipwreck.

THE MATTER OF EMPTINESS

Wagner’s *Gesamtkunstwerk* merged music, poetry and theater. His Parisian followers received his synaesthetic work in spiritualist terms: as a sensory, emotional and intellectual experience, but, significantly, as a spectacle that transcended its material supports. Art became an ideal medium that made it possible to leave matter behind. Wagner encouraged this dematerialization by hiding the orchestra: his musical and visual Leitmotifs now floated beyond instruments. The pantheist doctrines of material and spiritual unity from the first half of the century were frequently sublimated into a new form of dualism after 1850, one that resonated with table turning and spiritualism and with research into the “fourth dimension” of ether; a mercurial, weightless matter assumed to be at work in both séances and in gas-discharge tubes—precursors to today’s fluorescent and neon lights.¹⁵

Nevertheless, material supports were needed to produce transcendent effects; the late 19th-century's spiritual art was inseparable from its material productions. Wagner was depicted as a practitioner of animal magnetism, in a musical arms race with his rival Hector Berlioz, who contemplated conducting via telegraph.¹⁶ Networks of hydraulics and steam were busily accompanied by meshes of electric communication; telegraph lines raced along beside railroads, below and ahead of steamships; new synaesthetic equipment was launched. After David Brewster's hand-held Kaleidoscope (1815) came Frédéric Kastner's Pyrophone (1873) [114], its cylinders opening to dancing gas flames, followed by Alexander Wallace Rimington's Color-Organ (1893). Russian composer Alexander Scriabin [136] wove the multicolored electric lights of the Chromola device into his audiovisual symphonies.¹⁷ Experimental psychology, with its multiplying apparatus of minutely accurate timekeepers, sirens and flashing lights, tried to catch up with synaesthesia: Théodule Ribot in *Psychological Emotion* (1896) and Frederic W. H. Myers in *Human Personality and Its Survival of Bodily Death* (1903) sought recurrent equivalences between specific sounds (vowels, notes, timbres), colors and forms through experiments on patients with the condition—including Scriabin himself, one of Myers's subjects.¹⁸ Artists, composers and poets tuned in to these investigations. Paul Valéry later described artists of the 1880s developing "a doctrine of art derived from then fashionable theses of psychophysics. The study of sensibility by the methods of physics, research into the (hypothetical) correspondence of sensations, the energetic analysis of rhythm," all impacted painting and poetry.¹⁹

Yet the submission of the senses to elaborate machines—whether to analyze their functioning or provoke new experiences—could enervate as much as elevate. Jean des Esseintes, anti-hero of Joris K. Huysmans' *À rebours* (1884),²⁰ immersed himself in the esthetic experiments of his avant-garde contemporaries and his mechanized age. From rooms transformed into a steamboat, his imaginary voyage to London without leaving the train station, and his bejeweled tortoise, the book details des Esseintes's desperate quest for new sensations. The pinnacle was his perfume-organ, a Wagnerian apparatus to compose symphonies by fragrance; after an evocative performance, he collapsed.

JOHN TRESCH

Stéphane Mallarmé, one of des Esseintes's idols, acknowledged the seductions of Wagner but stopped short "halfway up the sacred mountain," before reaching "the too lucid and too threatening absolute" that the cult of art was proclaiming.²¹ For Mallarmé, a crowd transported by the total artwork, expositions or department stores revealed continuities with religious rites of the past. Yet partisans of the cult of art believed too earnestly and hastily that they could reach their barely-recognized goal of perfect communion through technical transubstantiation. He warned: "don't go and make the same mistake some preachers do, and lighten, through I don't know what dilution into the color of electricity and of the people, the archaic elsewhere of skies."²² The wrong lighting, a music that was too audible, traded in counterfeit heaven.

Instead Mallarmé advanced a conception of poetry as primordial music, an art that gestured indirectly toward an unspeakable emptiness at the root of thought and things. Poetic language indicates what cannot be said, through its intrinsic inability to capture what it speaks. Words placed like the frozen moves of ballerinas could "evoke, with intentional vagueness, the mute object, using allusive words, never direct, reducing everything to an equivalent of silence."²³ In place of the too-literal fantasia of 19th-century spectacles in the color of electricity, he demanded more patient and obscure illuminations, the carefully positioned marks of a void.

Language spaced across the page became rarefied silence. To Mallarmé's devotee, Marcel Duchamp, gesture became a mode of inactivity; material traces became a species of emptiness. Avant-gardes followed off these cliffs, exploring automaticity, the specific limits of the medium, self-reflexive puzzles without solution [164].

Two centuries of networked signal and noise, of destruction choreographed by electric connection, divide the blasphemous speech of Coleridge's wind-strummed lute from the present. In Bruce Nauman's sculptures of word and light, perhaps we see and hear the fullness of pantheism that pulsed in romantic synaesthesia collapsing into a cosmic twin—silent dark matter undercutting "light in sound." In one of Nauman's enigmatic circuits (1981–82), neon hums in twisted tubes of lemon, orange and fuchsia; words flare, expire and repeat:
VIOLINS... VIOLENCE... SILENCE.

This essay is dedicated to
Robert Michael Brain

- 1
Roberto Bolaño, *2666*, trans. by
Nataasha Wimmer (New York: Farrar,
Strauss, and Giroux, 2004), p. 795.
- 2
Helmut Müller-Sievers, *The Cylinder:
Kinematics of the Nineteenth Century*
(Berkeley, CA: University of California
Press, 2012); John Tresch, Emily I.
Dolan, "Toward a New Organology:
Instruments of Music and Science," in
Osiris, vol. 28, no. 1 (Chicago, IL: The
University of Chicago Press, 2013),
pp. 278–98.
- 3
Thomas L. Hankins, Robert J.
Silverman, Willem Hackmann,
Instruments and the Imagination
(Princeton, NJ: Princeton University
Press, 1995).
- 4
Samuel Taylor Coleridge, *The Eolian
Harp*, vv. 13, 21, 29, 45–46, 48, 50, 53,
in Ernest H. Coleridge (ed.), *The
Complete Poetical Works of Samuel
Taylor Coleridge*, vol. I (Oxford, UK:
Clarendon Press, 1912), pp. 100–02.
- 5
Douglas Kahn, *Earth Sound, Earth
Signal: Energies and Magnitudes in
the Arts* (Berkeley, CA: University of
California Press, 2013).
- 6
Emily I. Dolan, "The Origins of the
Orchestra Machine," *Current
Musicology*, n. 76, 2003, pp. 7–23;
Nicholas Mathew, "History under
Erasure: Wellingtons Sieg, the
Congress of Vienna, and the Ruination
of Beethoven's Heroic Style," *The
Musical Quarterly*, vol. 89, no. 1
(Oxford, UK: Oxford University Press,
Spring 2006), pp. 17–61.
- 7
Adelheid Voskuhl, *Androids in the
Enlightenment: Mechanics, Artisans,
and Cultures of the Self* (Chicago, IL:
University of Chicago Press, 2013).
- 8
Wolfgang Schivelbusch, *Geschichte der
Eisenbahnreise: Zur Industrialisie-
rung von Raum und Zeit im 19.
Jahrhundert* (München/Wien: Hanser,
1977), trans. by Anselm Hollo, *The
Railway Journey: Trains and Travel
in the 19th Century* (New York: Urizen
Books, 1979), pp. 57, 137.
- 9
Helmut Müller-Sievers, *op. cit.*,
pp. 23–40.
- 10
Jonathan Sterne, *The Audible Past:
Cultural Origins of Sound Reproduc-
tion* (Durham, NC: Duke University
Press, 2003); Jonathan Crary,
*Techniques of the Observer: on Vision
and Modernity in the Nineteenth
Century* (Cambridge, MA: The MIT
Press, 1992); Mara Mills, John Tresch,
"Introduction: Audio/Visual," *Grey
Room*, vol. 43 (Cambridge, MA: The
MIT Press, Spring 2011), pp. 6–15.
- 11
Jacques Rancière, *The Politics of
Aesthetics* (London: A&C Black, 2013);
Todd H. Weir (ed.), *Monism: Science,
Philosophy, Religion, and the History
of a Worldview* (Basingstoke: Palgrave
Macmillan, 2012).
- 12
Charles Duveyrier, "La Ville nouvelle,
ou le Paris des Saint-Simoniens,"
in C. Ladvoat (ed.), *Paris, ou le
livre des cent-et-un*, vol. 8 (Paris:
Ladvoat, 1832), pp. 315–44.
- 13
[Editor's Note: Verse 49 from the
poem *Le Cygne*. This poem is the
4th in a section of *Les fleurs du mal*
entitled "Tableaux Parisiens"
(Parisian Scenes), which was added
to the 2nd edition of the book. First
edition *Les fleurs du mal* (Paris:
Poulet-Malassis et de Broise, 1857,
2nd ed. 1861).]
- 14
Charles Baudelaire, "Exposition
universelle – 1855 – Beaux-arts," in
Id., *Œuvres complètes*, vol. II (Paris:
Michel Lévy frères, 1868), pp. 211–244:
219.
- 15
Falk Mueller, "Johann Wilhelm
Hittorf and the Material Culture of
Nineteenth-Century Gas Discharge
Research," *British Journal for the
History of Science* vol. 44, no. 2
(Cambridge, UK: Cambridge
University Press, June 2011); Linda
Dalrymple Henderson, "Ethereal
Bride and Mechanical Bachelors:
Science and Allegory in Marcel
Duchamp's 'Large Glass,'" *Configura-
tions* vol. 4, no. 1 (Baltimore, MD:
Johns Hopkins University Press,
Winter 1996), pp. 91–120.
- 16
Alison Winter, *Mesmerized: Powers of
Mind in Victorian Britain* (Chicago,
IL: University of Chicago Press, 2000).
- 17
Kerry Brougher, Judith Zilczer,
Jeremy Strick, Ari Wiseman, Olivia
Mattis, *Visual Music: Synaesthesia in
Art and Music Since 1900* (London:
Thames & Hudson, 2005).
- 18
Roy Porter, "Synaesthesia," in Adam
Lowe, Simon Schaffer (eds.), *N01se*,
exhibition catalogue (Cambridge,
UK: Kettle's Yard, 1999).
- 19
Paul Valéry cited in Robert Michael
Brain, "Genealogy of 'ZANG TUMB
TUMB': Experimental phonetics, vers
libre, and modernist sound art," *Grey
Room*, vol. 43, (Cambridge, MA: The
MIT Press, Spring 2011), pp. 88–117.
- 20
[Editor's Note: 1st edition published
in Paris by G. Charpentier et Cie.
Numerous editions of the book have
been published in English under
the titles: *Against Nature* or *Against
the Grain*.]
- 21
Stéphane Mallarmé, "Richard Wagner:
The Reverie of a French Poet," in
Barbara Johnson (trans.), *Divagations*
(Cambridge, MA.: Harvard University
Press, 2007); Jacques Rancière,
Mallarmé: The Politics of the Siren
(New York: Continuum, 2011).
- 22
Stéphane Mallarmé, *op. cit.*, p. 246.
- 23
Ibid, p. 264.