

# Calder and Sound



“Noise is another whole dimension.”

Alexander Calder<sup>1</sup>

A mobile carves its habitat. Alternately seductive, stealthy, ostentatious, it dilates and retracts, eternally redefining space. A *noise*-mobile produces harmonic wakes – metallic collisions punctuating visual rhythms.<sup>2</sup> For Alexander Calder, silence is not merely the absence of sound – silence generates anticipation, a bedrock feature of musical experience. The cessation of sound suggests the outline of a melody.<sup>3</sup>

A new narrative of Calder’s relationship to sound is essential to a rigorous portrayal and a greater comprehension of his genius. In the scope of Calder’s immense oeuvre (thousands of sculptures, more than 22,000 documented works in all media), I have identified nearly four dozen intentionally sound-producing mobiles.<sup>4</sup> Calder’s first employment of sound can be traced to the late 1920s with *Cirque Calder* (1926–31), an event rife with extemporised noises, bells, harmonicas and cymbals.<sup>5</sup> His incorporation of gongs into his sculpture followed, beginning in the early 1930s and continuing through the mid-1970s. Nowadays preservation and monetary value mandate that exhibitions of Calder’s work be in static, controlled environments. Without a historical imagination, it is easy to disregard the sound component as a mere appendage to the striking visual mien of mobiles. As an additional obstacle, our contemporary consciousness is clogged with bric-a-brac associations, such as wind chimes and baby crib bibelots.

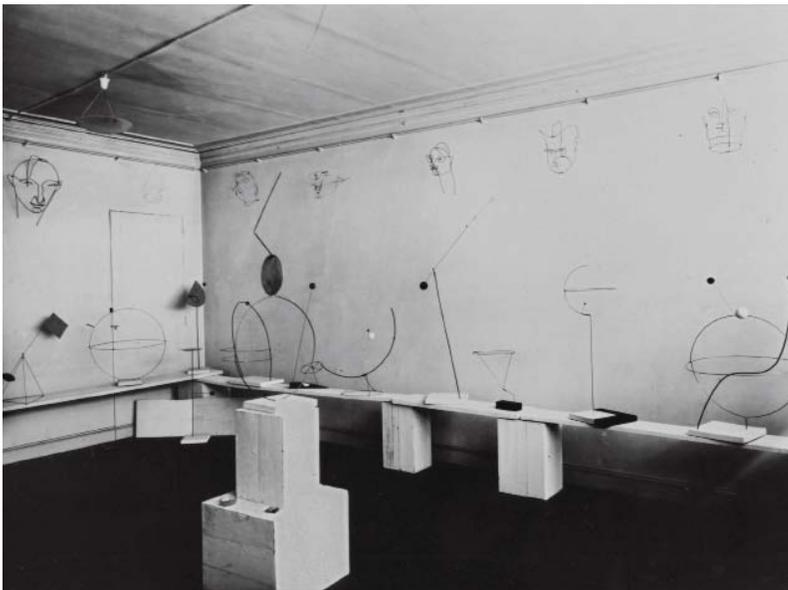
As if sequestered from this trail of mainstream bastardisations, the element of sound in certain works remains ulterior. At first glance, the musical dimension of *Untitled* (ca. 1934, cf. Works section, fig. 14) is uncertain. The mobile, repurposed pieces of pipe and a wooden ball, is too big to fit inside its iron hoop. Set in motion, it strikes the hoop – *Dwong!* – and stolidly adjusts itself with knocks and pings.

<sup>1</sup> Eric Schaal, Calder in his Roxbury studio with *The Gong* (ca. 1933) and *Untitled* (ca. 1940, cf. Works section, fig. 41), 1944

The fickleness of the collisions is frustrating – they come when one least expects them to, or not at all, generating another kind of noise: the internal babble of our (re)adjustments. *Untitled* (1936, cf. Works section, fig. 30) contains a vertical wire threaded through its squashed coronet, trailing down to a white wooden ball that dangles suspiciously in the immediate neighbourhood of the black base, ready to bump against, kiss or whack it. *13 Spines* (1940, cf. Works section, fig. 37) also produces noise *en passant*. One can picture Calder in his studio gathering the rods of this mobile together in his hand and then releasing his grip, provoking the chine-like cascade to collide jangling.

He worked without assistants and in complete silence, apart from the frequent sounds of clanging metal brought about by gusts of air; the many sculptures adrift in the rafters of his studio created an anarchic foliage. Like a clock wiped clean of its face, *The Gong* (ca. 1933) loomed overhead from Calder's procurement of his Roxbury studio in 1938 until his death in 1976 (fig. 1). Jean-Paul Sartre describes his encounter with the anthropomorphic work: "I once saw a beater and gong hanging very high up in his studio. At the slightest draught of air, the beater went after the rotating gong. It would draw back to strike, lash out at the gong and then, like a clumsy hand, miss. And just when you were least expecting it, it would come straight at it and strike it in the middle with a terrible noise."<sup>6</sup> André Masson depicts *The Gong's* totemic quality in his poem "The Studio of Alexander Calder":

Hung from the studio's rafters,  
in the streaks of light a gong sensitive to the caprices  
of air is struck only with the greatest caution  
With the step of a dove it rings: what hour does it sound?  
This is the hour of bustling centipedes  
It is also the hour of the child with cherries.  
Here the seconds lack the weight of the clock  
they do not rest in the grass  
they cannot conceive of immobility  
they love the rustling of reeds  
and the cry of the tree frog who breathes music  
they play between your fingers, Calder, my friend.<sup>7</sup>



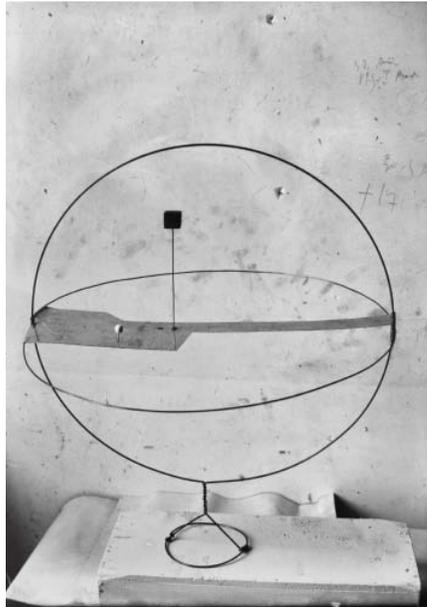
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Marc Vaux, Installation photograph showing the wire portrait *Edgar Varèse* (ca. 1930), second from top right, *Alexander Calder: Volumes – Vecteurs – Densités; Dessins – Portraits*, Galerie Percier, Paris, 1931

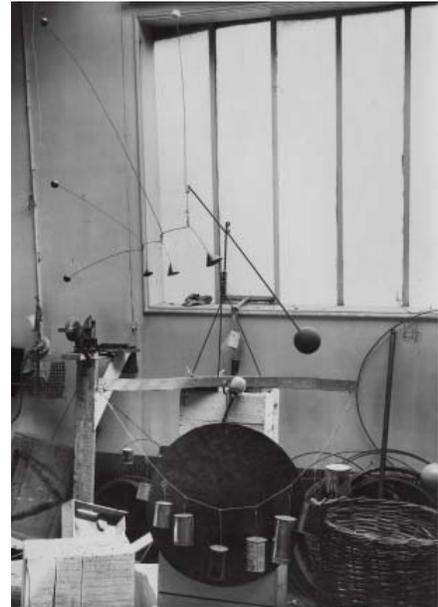
Masson's poem reveals the dimension of time peculiar to noise-mobile compositions, integrative constructions made possible by the spectator's projection of linear time; patterns of sound/silence create compositions cobbled from memory snapshots, with beginnings and endings given arbitrary placements.<sup>8</sup>

Calder's incorporation of sound indicates his receptivity to accidental phenomena in his working environment. More specifically, his employment of percussion is an extension of a desire to increase levels of variation and synergise disparate ingredients. Indeed, the mercurial constitution of sound itself presents a boundless range of variance. "To me the most important thing in a composition is *disparity*," Calder wrote in 1943. "Anything suggestive of symmetry is decidedly undesirable, except possibly where an approximation of symmetry is used in a detail to enhance the inequality with the general scheme."<sup>9</sup> Calder favoured the term "disparity" to describe his practice: "The idea of one body moving about another body which is doing something else, all by itself, is very exciting to me. And I think I have remained faithful to this original conception – that disparity is the spice of life, i.e. disparity of form, size, density, color and motion and perhaps a few other things."<sup>10</sup>

Among these "other things" was noise: Question: "How did you begin to use sound in your work?" Calder: "It was accidental at first. Then I made a sculpture called *Dogwood* with three heavy plates that gave off quite a clangor. Here was just another variation. You see, you have weight, form, size, color, motion and then you have noise."<sup>11</sup>



3



4

### Calder and Varèse

In 1926, Calder wrote to his parents, “I have been going to see some concerts. . . . I heard some Berlioz, + some Wagner, which are the principal [*sic*] things that rest in my mind.”<sup>12</sup> Mentioning two Romantic revolutionaries together – composers who moved beyond fixed classical forms and into a music of moods and atmospheres – shows Calder’s predilection for a modernist aesthetic.<sup>13</sup> It also forecasts his epochal visit to Piet Mondrian’s Paris studio in October of 1930. Already familiar with Mondrian’s geometric abstractions, it was the studio environment that shocked Calder fully into making abstract art. As he explained in his autobiography: “It was a very exciting room. Light came in from the left and from the right, and on the solid wall between the windows there were experimental stunts with colored rectangles tacked on. . . . I suggested to Mondrian that perhaps it would be fun to make these rectangles oscillate.”<sup>14</sup>

For several weeks following the visit, Calder created a small series of non-objective oil paintings before ultimately settling on sculpture as his preferred medium. Since the mid-1920s, the artist had defined mass with shapes cut from air, “drawing” with wire to capture energy and motion. He retained this innovative approach in his new methodology: “When I use two circles of wire intersecting at right angles, this to me is a sphere [cf. Works section, fig. 7] – and when I use two or more sheets of metal cut into shapes and mounted at angles to each other, I feel that there is a solid form, perhaps concave, perhaps convex, filling in the dihedral angles between them. I do not have a definite idea of what this would be like, I merely sense it and occupy myself with the shapes one actually sees.”<sup>15</sup>

During the same period of the visit to Mondrian’s studio, Calder was introduced to the *plus ultra-modern* composer Edgard Varèse. Fourteen years Calder’s senior, Varèse crafted visceral sound-structures with unorthodox compositional material. When the pair first met, Varèse was in the thick of composing *Ionisation* (1929–31), the first standalone concert hall piece for percussion with no folkloric basis, the score of which demands an exotic array of noisemakers even by today’s standards. Varèse visited Calder in his studio in the months preceding *Volumes – Vecteurs – Densités*;

*Dessins – Portraits*, his exhibition at Galerie Percier in April of 1931. In March of that year, Calder’s wife Louisa wrote to her mother-in-law, “Sandy is working downstairs, and talking to Varèse, the composer, whose music corresponds to Sandy’s wire abstractions, so he likes to watch him work.”<sup>16</sup> Testament to a burgeoning friendship, Calder executed a commanding wire portrait of the composer and a stabile, *Musique de Varèse* (ca. 1931), an implied wire sphere containing an ebony cube and a minute, nether wooden sphere poised above a jagged airstrip of tin plated steel (figs. 2, 3). “Crystallization” was among Varèse’s favourite words to describe the unfolding of his music; *Musique de Varèse*, perhaps Calder’s first light-reflecting sculpture, suggests penetration through a globe of pellucid substance, with droll objects disparately accenting the potentially blinding effect.<sup>17</sup>

Around 1932, Calder made an abstract ballet that consisted of “a frame with rings in the 2 top corners through which strings passed from the hands to the objects—springs, discs, a weight with a little pennant.”<sup>18</sup> A photograph from his studio during this period displays the musical component of the ballet, a collection of tin cans festooned from a string, organised roughly by size (fig. 4): “This was the ‘music’ – Varèse liked ballet (but not ‘music’). I called it ‘A Merry Can Ballet.’”<sup>19</sup> Like Varèse (to say nothing of their mutual friend Marcel Duchamp), Calder was an insatiable punster. *A Merry Can Ballet* (phonetically, the French pronunciation of “American ballet”) may have been a sly nod to Varèse’s *Amériques* (1918–21, revised 1927), and conceivably a self-deprecating innuendo in response to Varèse’s candid dislike of jazz. Presumably improvisational in character, the music of the ballet starkly contrasts with Varèse’s credo of “organized sound” and anticipates the influence of the mobile on postwar music.

The vernacular of one artist resonates with that of the other to a remarkable degree. In his own practice, Calder employed “volumes, motion, spaces bounded by the great space, the universe.”<sup>20</sup> For Varèse, a kind of sculptural parlance mingles with his musical language. The composer was not being metaphorical when he said in 1936, “Taking the place of the old fixed linear counterpoint, you will find

in my works the movement of masses, varying in radiance, and of different densities and volumes.”<sup>21</sup> In Varèse’s description of his composition *Intégrales* (1924–25), he might have been describing a Calder abstraction, perhaps most aptly a painting-in-motion such as *Snake and the Cross* (1936, fig. 5), which spotlights liquid evolutions of negative space circumscribed by its frame: “The changing projection of a geometrical figure onto a plane surface, with both geometrical figure and plane surface moving in space . . . each at its own changing and varying speeds of lateral movement and rotation.”<sup>22</sup>

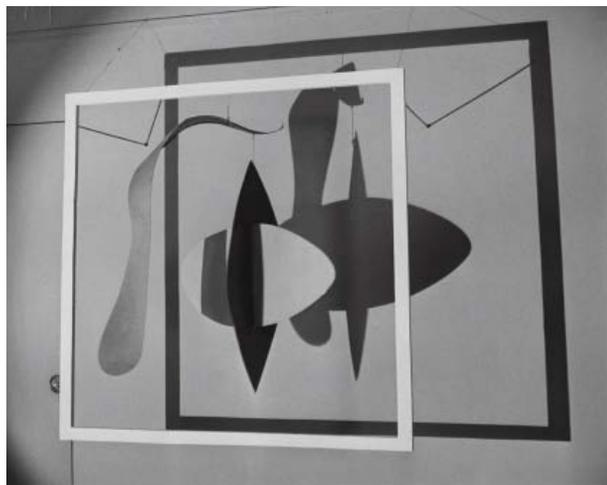
“Why not plastic forms in motion?” Calder wrote in 1933. “Not a simple translatory or rotary motion but several motions of different types, speeds and amplitudes composing to make a resultant whole. Just as one can compose colors, or forms, so one can compose motions.”<sup>23</sup> That Calder could realise his sculpture all the way to its completion must have invigorated Varèse, who suffered much of his life from concepts too advanced for the existing technology, confining the composer to unconventional means with traditional orchestral instruments in order to approximate the desired effects.<sup>24</sup> Rather than blend tones into a harmonic fusion – a backward-looking practice of neo-Romanticists – Varèse extracted and combined pitch characteristics of timbre and overtones in an effort to make “discernible the different planes and various sound-masses, and so [create] the sensation of non-blending.”<sup>25</sup>

“When I was about twenty,” Varèse once reflected, “I came across a definition of music . . . as ‘the corporealization of the intelligence that is in sounds.’ It was a new and exciting conception and to me the first that started me thinking of music as spatial – as moving bodies of sound in space.”<sup>26</sup> Thus, sound is a type of raw material that must be organised and animated by an artist, in order to release its spirit. It was not until 1957 that Varèse entertained the idea of introducing improvisation into his music, when he took part in a series of “jams” with an all-star combo of jazz musicians organized by the composer Earle Brown in New York City. Still, imagining a sound-producing machine, Varèse remarked in 1962, “Whatever I write . . . it will reach the listener unadulterated by ‘interpretation.’”<sup>27</sup>

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Marc Vaux, Alexander Calder,  
*Musique de Varèse* (ca. 1931), 1931

4  
Marc Vaux, Calder’s studio at 14 rue de la Colonie, Paris, 1933.  
From top: *Untitled* (1932), *A Merry Can Ballet* (1932/33), and  
*The Gong* (ca. 1933)

5  
Herbert Matter, Installation photograph showing  
*Snake and the Cross* (1936), Calder: *Stables & Mobiles*  
Pierre Matisse Gallery, New York, 1937



5

## Small Sphere and Heavy Sphere

Calder's application of sound in his invention of the first hanging mobile, *Small Sphere and Heavy Sphere* (1932/33, fig. 6, cf. Works section fig. 11), exposes his avant-garde roots.<sup>28</sup> Calder wrote to the curator James Johnson Sweeney in 1943: "One swings the red (iron) ball in a small circle – this movement + the inertia of the rod and the length of thread develop a very complicated pattern of movement. The impedimenta – boxes, cymbal, bottles, cans, etc. add to the complication, and also add sounds of thuds, crashes, etc."<sup>29</sup> The spectator intervenes by (re)organising the configuration of impedimenta, made of recycled and repurposed quotidian objects, and nudging the red ball to initiate the mobile's capricious course of collision. A real-time orchestration is generated, anticipating aleatoric and open form music of the post-World War II avant-garde.<sup>30</sup>

Calder determined impedimenta differentiated by pitch, timbre, and duration to produce a diversity of experiences. The ultimate visual and aural composition becomes a collusion of intervening forces – a collaboration between artist, spectator and climate. Parisian artists had employed laws of chance in Dadaist compositions before (for example, the collages of Jean Arp from 1916–17), but *Small Sphere and Heavy Sphere* is one of the first modern artworks featuring the radical intervention of the spectator. Preceding it was Calder's creation of *Object with Red Ball* (1931, fig. 7), whose spheres and post can be recomposed, allowing the spectator's subjective taste to determine a final aesthetic scheme.

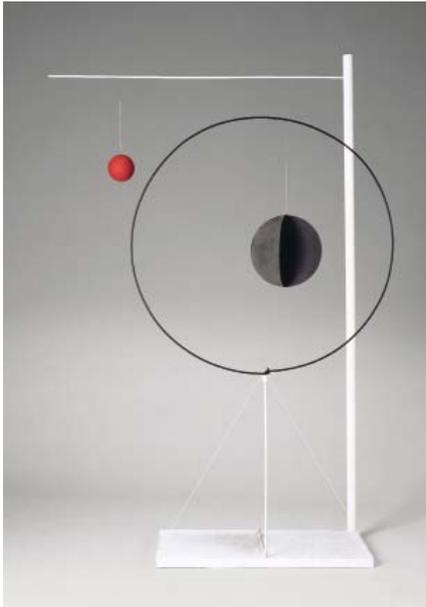
Noise-mobiles are intended to make sound, and a spectator's experience might feel incomplete when the work remains silent. In a drawing of *Small Sphere and Heavy Sphere*, Calder indicates that the bottles are empty; once struck they provide fuller, longer resonances. The sound of collisions between the elements lends a sense of palpability to the transfer of kinetic and potential energy.<sup>31</sup> Low volume resonances, sharp clinks, and hard bops serve as gratifying rewards and keep us hanging on. The work acts as a psychological experiment – our inner monologues flicker with anticipation: Will the ball connect? What sound will it make? When is the right moment to walk away?



6

6  
Alexander Calder, *Small Sphere and Heavy Sphere*, 1932/33  
Iron, wood, cord, thread, rod, paint, and impedimenta,  
Dimensions variable, Calder Foundation, New York;  
Bequest of Mary Calder Rower, 2011

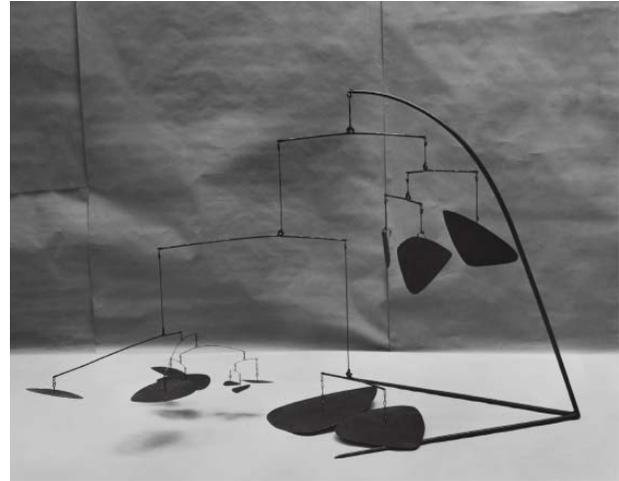
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Alexander Calder, *Object with Red Ball*, 1931  
Wood, sheet metal, rod, wire, paint,  
155.6 × 97.8 × 31.1 cm  
Calder Foundation, New York



7

Chance music is not for everyone. The lack of a trace of human intention risks leaving an audience cold, mystified, not "in" on the event. On the contrary, *Small Sphere and Heavy Sphere* elicits overt reactions. People laugh, gasp and discuss. The tangible suspense in the room recalls Gabrielle Buffet-Picabia's description of a work at Calder's 1932 Galerie Vignon exhibition: "A moving arabesque in wire balances itself and seems destined to interrupt the agitated path of a pendulum. Will they meet? No. They avoid one another with an infinitesimal precision."<sup>32</sup>

For his retrospective in 1969 at the Fondation Maeght in Saint-Paul-de-Vence, France, Calder overhauled and transfigured *Small Sphere and Heavy Sphere* under a new title, *Une Boule Noire, Une Boule Blanche* (1969) – one of the few instances in which he revisited past works. In the experimental stage of the sculpture's revitalisation, Calder auditioned a similar set of objects, including wooden boxes, metal discs, and bowls from his Roxbury kitchen. Ultimately, he did away with the bricolage and instead ordered nine steel gong-like bowls that varied greatly in size, although uniformly in Calder red, to be fabricated and "tuned" with the assistance of an ironworks in Tours, France. For "Calder's Universe" in 1976 at the Whitney Museum in New York, throngs of people crowded the edges of the sculpture, attracted as they were in 1969 to "sounds of solemn bells."<sup>33</sup>



8

### Noise-Mobile Evolution

From the late 1930s through the mid-1940s, Calder suspended sonorous elements in shared proximity, granting them freedom to pivot and resonate. The sundry clangours of *Black Foliage, Red Branch* (1945, fig. 8) represents this style, in contrast to Calder's gongs with protruding strikers (cf. Works section, figs. 41, 57). *Boomerangs* (1941), the airborne cousin of *The Clangor* (*Dogwood*, 1941, fig. 9), is one of two sculptures for which he fashioned chain-linked wire attachments.<sup>34</sup> A critic reviewing Calder's 1941 Pierre Matisse Gallery show singled out the sonic feature of *The Clangor*: "There is one mobile in particular . . . 'weighted' by metal disks of such tonnage that, colliding, they are metamorphosed into deep-throated bongos."<sup>35</sup>

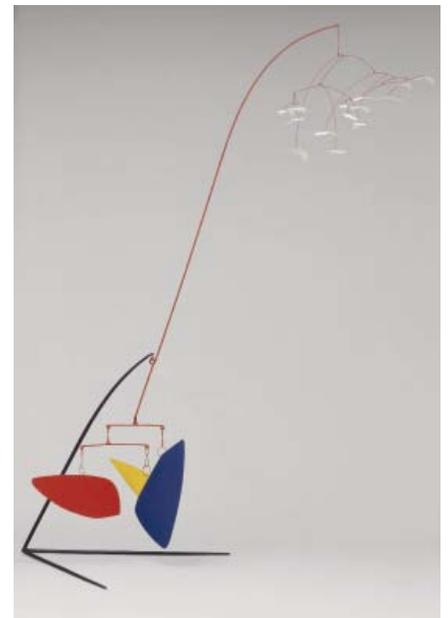
Calder was also interested in the visual effect of gongs. *Two Silent Gongs* (1974), the title of which speaks for itself, may have been repurposed from an earlier noise-mobile. *Black Tulip* (ca. 1942), a spray of arching florets, features a gong that silently revolves, while small rings drooping from horizontal bars smack the black forms of its base. There are noise-mobiles of furtive, quieter stock, for example the tinkling pitchfork shards of *Tines* (1943), or the black moon on the verge of being tapped by the miniscule sphere at the heart of *Tentacles* (1947, cf. Works section, fig. 50, cf. page 96).

By the late 1940s, Calder had synthesised mobiles and gongs and showcased his formalisation in "Alexander Calder: Gongs and Towers" at the Curt Valentin Gallery in 1952.<sup>36</sup> Prototypical of this refined style is *Triple Gong* (ca. 1948, cf. Works section, fig. 57), with its red tendril-like wires plunging down through space and perking up to terminate in metal cylinders (beaters) in plane with three brass gongs hung in a sequence of pitches. Calder applied this technique, where mobiles breathe independently and yet in agreement with their gong supplements, throughout the 1950s and into the 1960s with *Big Gong* (1951); *Red Gong* (1951); *Red, Yellow and Blue Gong* (1951); *Sumac with Gong* (1951); two works known as *Triple Gong* (1951); *Red Gongs* (1951); *Double Gong* (1953); *Horizontal Red Moon Gong* (1957); and *Blue Moon* (1962).

## Tracing Calder's Musical Legacy

A study of Calder's musical influence is waiting to be written. One point of orientation begins in the late 1940s when artists in America and Europe began to re-engage with Dadaist ideas; when John Cage secured a foothold and drew alliance with the re-emerging Duchamp. Seeking references to authorize and elucidate their strange musical articulations, and non-cloistered expression homologous to their new compositions, Pierre Boulez, Earle Brown, Aldo Clementi, Roman Haubenstock-Ramati, Mauricio Kagel, György Ligeti, Witold Lutosławski, Henri Pousseur and others compared their work to mobiles. "Mobile," "stabile," and "mobility" were terms soon absorbed into musical vocabulary, having become familiar to composers through lectures and performances at the Darmstadt International Summer Courses for New Music in Germany beginning in the 1950s. These Calder-derived concepts grew into flexible descriptors for dynamic innovations to the musical score. "Mobiles," as Polish composer Lutosławski described sections of his *String Quartet* (1964), are "passages of collective ad libitum in which the parts contain discrete repeated fragments. . . . The aural result is analogous to the visual effect when a mobile of Alexander Calder is viewed from different angles. The relation of part to part and part to whole is constantly changing, familiar fragments of sound returning in ever-new contexts."<sup>37</sup>

Taking cues from Calder and literary modernists such as James Joyce, Stéphane Mallarmé and Gertrude Stein, composers radically re-evaluated not only the musical score but also its performative implications. Proponents of the new avant-garde identified the traditionalist presumption that musicians were empty vessels to be filled, mechanisms for realising "closed," fixed scores. Traditional goals of a musical performance (for example, the precise interpretation of a composer's intent, interspersed with displays of technical virtuosity) were set in contrast to "open" scores, which require active participation and decision-making by the performer. The degrees between these two performer roles (one leaving no room for interpretation, the other offering choice and collaboration) became a field of dispute and experimentation.<sup>38</sup>



8

Alexander Calder, *Black Foliage, Red Branch*, 1945  
Sheet metal, wire, and paint, 129.5 × 200 cm  
Kawamura Memorial Museum of Art, Chiba, Japan

9

Alexander Calder, *The Clangor (Dogwood)*, 1941  
Sheet metal, wire, and paint, 270.2 × 243.8 cm, Private collection

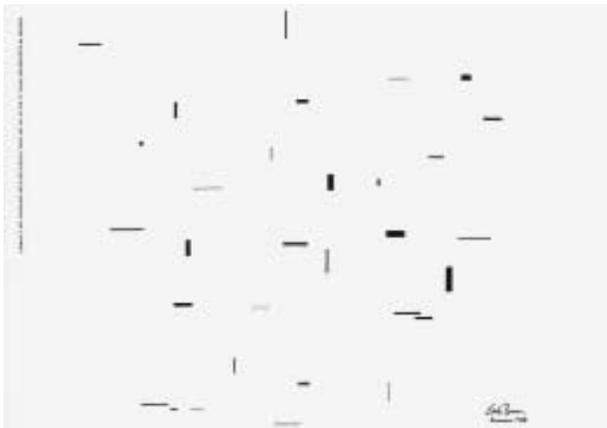
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Points of  
Infinite Direction

"Time is the actual dimension in which music exists when performed and is by nature an infinitely divisible continuum. No metric system or notation based on metrics is able to indicate all of the possible points in the continuum, yet sound may begin or end anywhere along this dimension."<sup>39</sup>

Composer Earle Brown's first encounter with a mobile in the late 1940s prompted his invention of "mobile composition," a type of music later popularised in Europe as open form. A member of the New York School (along with Cage and Morton Feldman), Brown became obsessed with the mobile's musical parallels and his landmark *December 1952* (1952–54) suggests punctuated constellations of quick-witted improvisation. Resembling a visual artwork, the score is a grid of thirty-one randomly placed shapes, which Brown conceived as a freeze-frame of constantly evolving points of infinite direction (fig. 10). Performable "in any direction from any point in the defined space for any length of time" (and for any number of performers and types of instruments with no specification of rhythm), musicians must enter the score's imaginary landscape and personally navigate its depths with musical decisions.<sup>40</sup>

In 1963, Brown received a commission from Diego Masson, the son of André Masson, to write a piece for his First Percussion Quartet of Paris. In a gesture of homage to his hero, Brown began work on a composition to be conducted by a mobile. He visited Calder in his studio in Saché, France, to propose the idea, and Calder was, by Brown's account, immediately intrigued. To radicalise the concept further, the mobile also would be played as an instrument. Three years later, Calder's monumental standing mobile *Chef d'orchestre* (1966) arrived in Paris (fig. 11). Brown had assigned cues for the percussionists corresponding to the mobile's presumed colors. As it arrived painted entirely red, he hastily adapted his composition to the monochromatic scheme.



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10  
Earle Brown, *December 1952*, excerpt from *FOLIO* (1952/53)  
and *4 SYSTEMS* (1954), 30.2 × 42.6 cm

11  
Dennis Gilbert, Contemporary Music Festival, 1980  
Earle Brown's *Calder Piece*



11

*Chef d'orchestre* has been described as a "bony, angular, multilimbed conductor."<sup>41</sup> Its fourteen circular and ovoid elements, which hover within a drummer's reach, provide different pitches, apart from two of the same. When struck with mallets the mobile produces round, short-decay gongs. Brown's *Calder Piece* (1963–66) places four percussionists at corners equidistant to *Chef d'orchestre* and equipped with a battery of more than 100 percussion instruments. At several points, the percussionists advance upon the mobile, strike its bobbing forms, and leaving it swinging, sprint back to "read" its varying configurations.<sup>42</sup> In order to interpret its gestures, the percussionists imagine the mobile's "petals" on the page, and play the phrases traced by the shape. The music develops from inarticulate noises of friction to solos and duos ranging from hesitant to obstreperous, with an earsplitting explosion toward the end. A feedback circuit develops as the perspectives of the musicians change in relation to the spinning conductor. The spectacle bespeaks the synaesthetic effect of Calder's work: music through exquisite movement. The première performance at the Théâtre de l'Atelier in 1967 was met with much acclaim, with one critic remarking, "Such a phenomenon of resonant exchange between the musical and the plastic-visual elements will remain one of the most enriching conquests of our time."<sup>43</sup>

Beyond his stature as a composer of motion, Calder expanded the vocabulary of sculpture by permitting his mysterious objects noise-making capabilities. An artist who addressed issues fundamental to composers of music, Calder was a visionary of the increasingly blurred, intermingling categories of art. At a time when contemporary sound art is receiving ever-increasing attention in galleries and museums, Calder stands as a foundational figure and a primary twentieth-century source for compositional experimentation.

**1** Alexander Calder quoted in: Jane Howard, "Close Up—Mobile Maker's Giddy Whirl," in: *Life*, 5 March 1965, p. 48.

**2** Calder used the term "noise-mobile" [emphasis mine] in a 9 June 1973 interview with Joan Marter, quoted in: Marter, *Alexander Calder* (Cambridge: Cambridge University Press, 1991), 129. Decades earlier Calder also referenced his "noisy mobiles"; examples can be found in the Malcolm Cowley correspondence file and the Museum of Modern Art, New York, exhibition binders, Calder Foundation archives.

**3** Here I allude to a principle that Olivier Messiaen used to describe certain passages of his *Et exspecto resurrectionem mortuorum* (1964): *A melody by default: the cessation of sounds gives its outline* (trans. Felix Aprahamian, CBS Records, SBR 2353 64 [1966]). Thanks to Robert Piencikowski for this reference.

**4** In addition to these works, many of which are discussed throughout this text, Calder was involved in a number of projects in which sound played an essential role, including two early collaborations with Martha Graham and one with Virgil Thompson, who commissioned Calder to create a mobile setting for Erik Satie's *Socrate* (1936). Among later sound-related projects was his commission for the University of Venezuela: Initially told by architect Carlos Raúl Villanueva that a mobile could not be hung in the auditorium because the ceiling was occupied with ribbons of acoustical reflectors, Calder gave a response characteristic of his resolute curiosity: "Let us play with these acoustical reflectors." The result was his *Acoustic Ceiling* (1954), made from large, colorful panels of plywood tilted in horizontal orientations to reflect sound. See *Calder: An Autobiography with Pictures* (New York: Pantheon Books, 1966), p. 240.

**5** For an investigation of Calder's theatricality, and a different reading of his "aural experiments," see Arnauld Pierre's "Staging Movement," in: *Alexander Calder: 1898–1976* (Washington, D. C.: National Gallery of Art, 1998), pp. 329–47. Pierre's characterization of noise-mobiles recalls the Wagnerian concept of the Gesamtkunstwerk, a synthesised, total work of art: "Calder's aural experiments . . . indicate the artist's wish to enlarge the theatrical possibilities of his devices by working out through them the bases of a total production" (p. 333). Also notable for its theatrical portrayal of Calder's engagement with sound is Hans Richter's film *From The Circus To The Moon* (1963), which features the artist filling cans with stones to create homemade shakers. Holding one to his ear, listening attentively – *Eureka!* – his expression bursts into jubilation – *he has found the right sound*. He flourishes the shakers in jazzy patterns like a *percussionista*. It is equally thrilling to watch Calder deftly rap elements of *Le Gong c'est une lune* (1954) with his knuckles and fingertips.

**6** Jean-Paul Sartre, "Les Mobiles de Calder," in: *Alexander Calder: Mobiles, Stables, Constellations*, exh. cat. (Paris: Galerie Louis Carré, 1946), pp. 9–19. English translation by Chris Turner, from *The Aftermath of War: Jean-Paul Sartre* (Calcutta: Seagull, 2008).

**7** André Masson, "L'Atelier d'Alexander Calder," handwritten poem, 1942. "Arrivé d'Europe, comme ils disent / Il est vrai que là-bas fer et cuivre ne sont qu'œuvre noir / la mort ajoutée à la mort et la vie calamité. / Moi je fûs, heureux fugitif / Couché à l'œuvre d'un vivant / Le jour et la nuit s'ouvriraient devant / des ailes - algues - feuilles mobiles. / Bonjour forgeron de géantes libellules / Sourcier du mercure ta fontaine montrait / Une eau lourde comme les pleurs. / Mais un carrousel de petites lunes écarlates me réjouit / Je pense à un cirque transparent / C'est une feuille traversée par le soleil. / Tu as vu un jour vert un oiseau rouge / à la poursuite d'un oiseau jaune; / tu sais que nous sommes liés à la nature / que nous appartenons à la terre. / Très haut suspendu à la charpente de l'atelier / dans le jour strié un gong sensible aux caprices de l'air / n'est frappé qu'avec une extrême circonspection / A pas de colombe il sonne: quelle heure sonne-t-il? / C'est l'heure du mille-pattes très affairé / C'est aussi l'heure de l'enfant aux cerises / Ici les secondes n'ont pas le poids de l'horloge / elles ne sont pas non plus couchées dans un hercier / elles ne conçoivent pas l'immobilité / elles aiment le bruissement des roseaux / et le cri du crapaud d'arbre qui sait si bien respirer en musique / elles jouent entre tes doigts Calder, mon ami." Originally reproduced in English in: *Calder*, exh. cat. (New York: Buchholz Gallery/Curt Valentin, 1949); revised translation in: *Calder in Connecticut*, ed. Eric M. Zafran, exh. cat. (New York: Rizzoli, 2000), p. 16.

**8** See also the description of Earle Brown's *December 1952* in "Points of Infinite Direction."

**9** Calder, "A Propos of Measuring a Mobile" (manuscript, Archives of American Art, Smithsonian Institution, 1943).

**10** Calder (manuscript, Calder Foundation archives, 1956), p. 14.

**11** Calder and Katherine Kuh, "Alexander Calder," in: *The Artist's Voice: Talks with Seventeen Artists* (New York and Evanston, Illinois: Harper & Row, 1962), 44.

**12** Letter from Calder to Alexander Stirling Calder and Nanette Lederer Calder, 1 December 1926, Calder Foundation archives.

**13** Thanks to Jed Perl for this description.

**14** Calder 1966 (see note 4), p. 113; see also Calder, "The Evolution" (manuscript, Calder Foundation archives, 1955–56), p. 78.

**15** Calder, "What Abstract Art Means to Me," in: *Museum of Modern Art Bulletin* 18, no. 3 (Spring 1951), pp. 8–9. Calder is probably reading from texts he wrote in the early 1930s.

**16** Louisa Calder to Nanette Lederer Calder, 15 March 1931, Calder Foundation archives.

**17** The Calder and Varèse families enjoyed a multigenerational friendship – Calder's daughter Mary lived in New York in the MacDougal-Sullivan Gardens across from Varèse and his wife Louise. In the early 1930s, Calder presented Varèse with two sculptures, *Jeune boeuf* (ca. 1928) and *L'Oiseau* (ca. 1930). Before leaving for New York in 1933, Varèse included the animals in a collection of objects he gave to his student André Jolivet, who drew on these "fetish objects" as inspiration for *Mana* (1933), an incantatory piano piece about primeval worship. Among other gifts, Calder gave Varèse a gouache, *Tourbillons* (1962), an apposite symbol given their shared fascination with spirals, which the composer placed prominently in his work-place. Calder also made him a music stand around 1931 to accommodate the composer's sometimes extremely large scores, with the wire inscription, "Homages a Varese." Louise Varèse ("Pony," as Calder nicknamed her, a translator of French avant-garde writings) received a ring, necklace, belt buckle, and bracelet, all with the spiral motif, as well as a 1949 drawing commemorating a shared love of the circus.

**18** Calder, "The Evolution" (manuscript, Calder Foundation archives, 1955–56), p. 106.

**19** *Ibid.*, p. 107.

**20** Calder, "Comment réaliser l'art?" in *Abstraction-Création, Art Non Figuratif*, no. 1 (1932), 6. Translated at Calder Foundation, New York.

**21** From "Edgar Varèse, 'Great Sound Builder' is Here," *Santa Fe New Mexican*, 15 June 1936; quoted in: Fernand Ouellette, *Edgard Varèse*, trans. Derek Coltman (New York: Orion Press, 1968), p. 84.

**22** Ouellette 1968 (see note 21), p. 83. In his introductory text for the exhibition catalogue *Calder: Sculptor of Air* (Milan: 24 ORE Motta Cultura, 2009), Alexander S. C. Rower elaborates, "Later in the 1930s, Calder addressed the frontal formality of painting, yet rendered in three dimensions, and with the introduction of motion. . . . [Calder used] the variable composition of a changing foreground against a static background to create a performance, as these paintings in motion act out a spatial drama with a cast of abstract objects."

**23** Calder in *Modern Painting and Sculpture*, exh. cat. (Pittsfield, Mass.: Berkshire Museum, 1933), pp. 2–3.

24

Varèse intended for *Intégrales* "to employ certain acoustical means which did not yet exist, but which I knew could be realized and would be used sooner or later." Quoted in Ouellette 1968 (see note 21), p. 83. As early as 1930, Varèse had conceived of a path of loudspeakers located in various spots to move sound through space (Ouellette 1968 (see note 21), p. 105), however it was not until his *Poème électronique* (1958) that he was able to determine spatial projection radically. *Poème électronique* was the result of a collaboration extended to Varèse by the architect Le Corbusier for the 1958 Brussels World's Fair, for which approximately 350 speakers were installed in the Philips Pavilion along sonic pathways, in the concavities and ribs of the roof, and other strategic locations to broadcast Varèse's electronic composition.

25

According to Varèse, "Timbres and their combination – or better, quality of tones and tone-compounds of different pitch, instead of being incidental, become part of the form, coloring and making discernible the different planes and various sound-masses, and so creating the sensation of non-blending." Quoted in Ouellette 1968 (see note 21), p. 60.

26

Ouellette 1968 (see note 21), p. 17.

27

Ouellette 1968, 147. Varèse had declared in 1930, "The performer, the virtuoso, ought no longer to exist: he would be better replaced by a machine, and he will be." Quoted in: J. Vidal, "le Film sonore engendrera-t-il de nouvelles tendances musicales," in: *Pour vous*, 30 January 1930; quoted in Ouellette 1968 (see note 21), p. 106.

28

Calder considered *Small Sphere and Heavy Sphere* an important work in his oeuvre, suggesting it to James Johnson Sweeney for inclusion in his 1943 retrospective at the Museum of Modern Art, to no avail. The current exhibition marks the fifth time the work has been shown in public; it was first exhibited in 1933 at Galerie Pierre Colle in Paris, followed by the Whitney Museum in New York in 2008 (travelling to the Centre Pompidou, Paris), and the Palazzo delle Esposizioni, Rome, in 2009.

29

Calder to James Johnson Sweeney, 28 August 1943, Calder Foundation archives.

30

"Aleatoric," from the Latin word "alea," connotes a die, a risk, or games involving chance. An early example of music determined by chance is Marcel Duchamp's *Erratum Musical* (1913), a score for three voices, based on note values shuffled and randomly drawn from a hat, which was coincidentally composed the year of John Cage's birth (who is commonly credited with formalising chance-operated music in 1951 with his *Music of Changes* by a method of throwing dice and systematizing the outcome in accordance with the *I Ching*). Steve Reich's *Pendulum Music* (1968–73), a process-based composition, involves a number of microphones suspended the same

distance from the floor above speakers turned up to produce feedback. Performers each take a microphone, pull it back like a swing, and release in unison. The speakers emit soughs, chirping pulses that change in phase relation as the pendular movements taper off. Shortly after all the microphones have come to rest in a continuous drone, the power is cut. *Pendulum Music* bears a perceptible relationship to *Small Sphere and Heavy Sphere*. Although both works trespass across the line separating sculpture and music, they are fundamentally different in locomotion and personality. *Pendulum Music* showcases the stark musical result of strict physicality, whereas *Small Sphere and Heavy Sphere* is a matrix of movements and sounds.

31

Here I paraphrase the Calder Foundation's Curator of Special Projects Katherine Cohn from her unpublished exhibition proposal, "Positive Sound."

32

Gabrielle Buffet-Picabia, "Alexander Calder, ou le roi du fil de fer," in: *Vertigral* 1, no. 1, 1932.

33

"For a Big Show in France, Calder 'Oughs' His Works," *New York Times*, 3 April 1969.

34

The other is *Lobster Trap and Fish Tail* (1939), commissioned for the principal stairwell of the Museum of Modern Art, New York.

35

Edward Alden Jewell, "Artists Depict a War-Torn World," *New York Times*, 1 June 1941.

36

Not long after this exhibition, "sound sculptor" Harry Bertoia followed in Calder's footsteps by formalizing the use of metal for its sound properties. Bertoia began in 1960 to stretch and bend metal rods into drifting formations resembling desert grasses. Sensitive to wind and touch, these tonal pieces approximate meteorological phenomena with thick beds of hissing tintinnabulation.

37

Quoted in Steven Stucky, *Lutosławski and His Music* (Cambridge: Cambridge University Press, 1981), p. 110.

38

A quotation from Pierre Boulez reveals the broad analytical space between "open" and "closed" compositions: "I was talking about open form last year concerning [the composer] Webern when form could possibly close itself but remain suspended . . . this closing, haphazard and open, is the worst enemy of a form. . . . What I am looking for in an unclosed trajectory is rather a state of suspension in time. As one speaks of a body or an object suspended in a liquid, for example." Letter from Pierre Boulez to Henri Pousseur, end of July 1957, Paul Sacher Foundation.

39

Earle Brown, from a programme note to *Music for Cello and Piano* (1955).

40

Brown, from a prefatory note to *December 1952*, excerpt from *FOLIO* (1952/53) and *4 SYSTEMS* (1954).

41

Edward Rothstein, "Music Noted in Brief; Calder Mobile Conducts a Work by Earle Brown," in: *New York Times*, 16 November 1981.

42

According to Brown, Calder commented after the premiere: "I thought that you were going to hit it [the mobile] much harder – with hammers." Perhaps Calder was joking, but he apparently considered making a replacement conductor from brass instead of steel, although Brown later expressed that the mobile had a unique timbre that he preferred to keep because the sound of the sculpture when struck by the percussionists' mallets was distinct and different from the other percussion instruments in *Calder Piece*. Brown on *Calder Piece*, recorded ca. 1967, Tape MD49, The Earle Brown Music Foundation, Rye, NY.

43

Claude Rostand, *Le Figaro Littéraire*, 21–27 August 1967.