

5

STUDIO  
STAGE  
FAIR  
PUB  
STREET

MORGAN O'HARA  
LIVE TRANSMISSION 5

published on the occasion of solo exhibition  
at the Centre for Recent Drawing / London  
25 April - 2 June 2012

C4RD

Centre for Recent Drawing  
2-4 Highbury Station Rd LONDON N1 1SB  
+44 2032396936 Charity No.1123530 www.c4rd.org.uk

in collaboration with  
ENGLISH NATIONAL BALLET  
London



ACKNOWLEDGEMENTS

Nellie Rakovsky  
Educator HERMITAGE MUSEUM St. Petersburg  
Docent METROPOLITAN MUSEUM OF ART New York

Misha Rakovsky  
ARCHITECT  
New York

David Harper  
BROOKLYN ACADEMY OF MUSIC  
BAMarts curator

Craig Hassall  
ENGLISH NATIONAL BALLET  
Director 2005 - 2012  
London

Ornella Bramanti  
LUBRINA EDITORE  
Bergamo, Italia

FOUNDATION '59

PHOTOGRAPHS

Matsumoto Tadasu, Tokyo (pages 6 and 8)  
Frank Lei, Macau (page 102)  
Andrew Morgan, London (page 8)  
Lei Tak Seng, Macau (page 5)  
Casey Rae, St. Louis (all drawings)

Designer: Dan Niver  
Printer: Integrated Book Technology, Inc.

© Morgan O'Hara  
www.MorganOHara.com

ISBN Number:



Dedicated in loving memory of  
NELLIE RAKOVSKY

???

“Dedicated in loving memory to” - ?

“Dedicated to the memory of” - ?

ENCYCLOPEDIA OF LIVE TRANSMISSION

Volume I / 2000  
**HOSPITAL - CLINIC - HEALTH STUDIO**  
Galleria Civica di Modena, Italia

Volume II / 2002  
**CONCERT HALL - OPEN SPACE**  
Teatro Sociale di Bergamo, Italia

Volume III / 2005  
**PEOPLE AT WORK IN MACAU**  
Macau Art Museum, China

Volume IV / 2008  
**FARM - LABORATORY - OFFICE - SITE**  
Castello Borromeo, Corneliano Bertario, Italia

Volume V / 2012  
**STUDIO - STAGE - FAIR - PUB - STREET**  
Centre for Recent Drawing, London, UK



TABLE OF CONTENTS

7	POET OF THE PARSING WORLD ANDREW HEWISH
9	INVITATION TO THE DANCE CRAIG HASSALL
11	GRAPHIC ABSTRACTIONS ON CONCRETE AND COSMIC THEMES NELLIE RAKOVSKY
13	THIS ART IS NOT A SPECTATOR SPORT SCHUYLER BROWN
15	TRADITIONAL DANCE
35	WESTERN CLASSICAL DANCE 36 English National Ballet 53 Morning Class
55	CONTEMPORARY DANCE 56 Butoh 64 Merce Cunningham Dance Company 74 Pina Bausch Dance Company 81 Frankfurt Ballett / Forsythe Company 90 Other Dancers
103	GRAPHIC RECORDING. MORGAN O'HARA'S LIVE TRANSMISSIONS BETWEEN ART AND SCIENCE SUSANNE LEEB



## POET OF THE PARSING WORLD

ANDREW HEWISH • DIRECTOR • CENTRE FOR RECENT DRAWING

It has been a privilege to have been able to bring together two artistic practices of such high quality, that of the artist Morgan O'Hara and that of the English National Ballet. Within her busy international schedule O'Hara has for three years attended the performances and rehearsals of the English National Ballet in London to continue her work, and it was an act of generosity by the dancers to welcome her as they did. O'Hara is known internationally for her LIVE TRANSMISSION work, which involves her handling bunches of very sharp pencils and tracking on paper with two hands, simultaneously, the movements that people undertake in their everyday activity.

Drawing has a historical association with the ephemeral, both in the fragility of traditional materials but also its capacity to capture the passing world. Here is gesture that encodes time in the length and implication of speed

of the mark, but often also in its repetition. Here is a language distinct to drawing in an expanded field which recalls the difference in each repetition of the frames of Edward Muybridge's motion studies. These works collapse drawing as documentation, performance, and seeing; as both diagrammatic and mimetic. They occupy a liminal space between a flattened, formal two dimensional plane and an intimation of the third dimension's depth of field.

These drawings bestow dignity on the everyday activity which they record, and occupy their own insistent formal presence. They also communicate embodiment back to the dancers. Matching the physical with the physical, Morgan recounts how easily these the dancers recognize their own experience in these drawings. O'Hara has found a unique equivalence to that rarified and complex form of human activity that is dance.

**C4RD**  
Centre for Recent Drawing





## INVITATION TO THE DANCE

**CRAIG HASSALL • DIRECTOR 2005–2012 • ENGLISH NATIONAL BALLET**

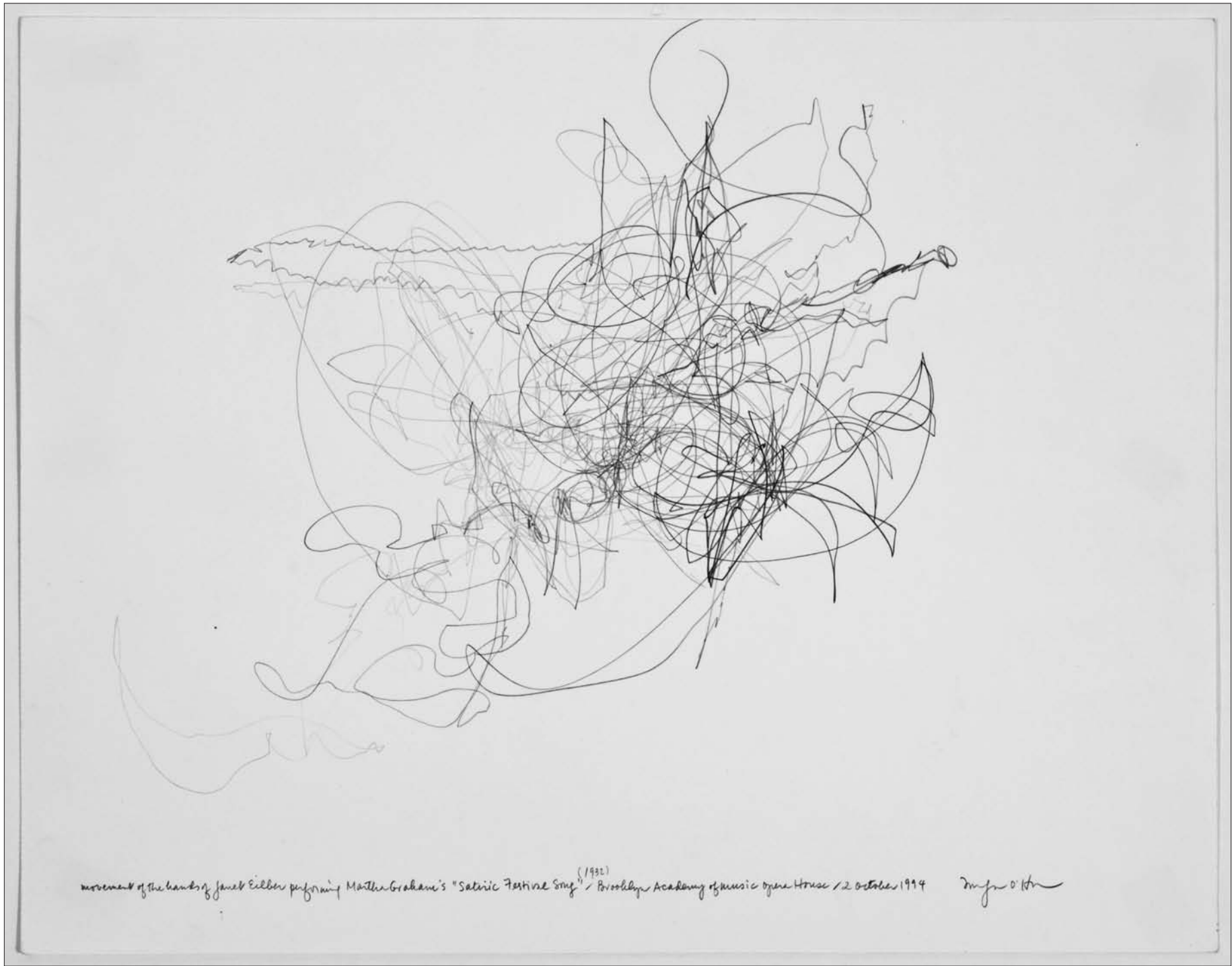
Morgan O'Hara is an artist of exceptional individuality and creativity. Her work takes the oeuvre of drawing to a new level. Morgan approached me when I was managing director for English National Ballet with a request to draw the dancers. It is not telling tales out of school to say that the Company received many such requests and usually obliged, although with a certain sigh of resignation, as the results were invariably ethereal and inferior renditions of faux-Degas ballerinas in unconvincing and rigid poses.

Morgan's approach was a revelation to the dancers and all in the rehearsal room. Her particular style was engaged and detached at the same time. Her frenetic and kinetic interpretations of movement had never been seen

before. It was most interesting that the dancers immediately understood her intention and appreciated her elucidation. For artists who took part in a structured ballet class almost every day of their lives, to see this represented as kinetic drawing was a fascination.

Morgan celebrates creativity and movement in her work. Rather than merely represent the artists that interest her, she presents another dimension to their abilities which at first glance is completely foreign to the observer, however upon closer examination was always there—if only we had taken the time to look a little more closely.





# GRAPHIC ABSTRACTIONS ON CONCRETE AND COSMIC THEMES

NELLIE RAKOVSKY • NEW YORK • 1998

*Educator, Writer, Lecturer The Hermitage Museum, Leningrad, The Soviet Union  
Docent The Metropolitan Museum of Art, New York*

In the darkness it was impossible to see what would come out as the artist evidently tracked a dance performance. In any case, the activity of the pencil didn't contradict what was happening on the stage, its sensitive beak timidly wandering, circling and sliding on the page and then rushing back and forth, suddenly collapsing and afterwards energetically increasing tempo. The result seen in the light turned out to be a wrinkled web of scribbles, a drawing-like foetus in the spirit of Beuys, a thin slice cut from something which asked for the characteristic "untitled", but I saw it: the graphical scalp of Pina Bausch had been taken.

Silverish hairy heaps of lines with fragile and brittle plaitings, imbued with erotic overtones or ascetic arabesques, savory ink blots on luxurious handmade paper were the works seen later. They looked like precious paraphrases of the vortices of Pollock, like fantastic networks in the mechanisms of the twentieth century, or unintentional rapport with the rope constructions of Eva Hesse. What is certain: these works are the successions of the very intricate junctions in the dark and light, line and volume, engendered by the crystalline mass of New York City - successions one perceives as sophisticated chamber additions to its harsh urbanity.

Movement of leaves of the tree seen from the window of apartment 12 on MacDougal Street in New York City in 1994—this title evokes the romanticism of Caspar David Friedrich, German painting of the 19th Century and generally the northern painting tradition, with its usual motif of the window through which the world - abyss - God - are contemplated. The drawing itself in the glowing white cosmos of the page is a soft mist, a many layered net of melancholic lines and troubled strokes of graphite, pulsing, beating, spiraling and clotting, increasing their flesh with a number of black epicenters. However this flesh remains pierced by a cool metaphysical light and when inside this chaos and especially at its edges, we discover the algo-

rithm—we understand that here there is some hidden law. If Plato's idea that our lives are shadows is true, O'Hara draws shadows of these shadows looming before our eyes.

Baklava maker Nedret Khan preparing a Turkish pastry on MacDougal Street on November 7, 1995, an enigmatic strange arabesque, the cipher of another reality, is, nevertheless, a drawing made from nature and charged with the meaning of its title. The titles of O'Hara's works are kindred to Japanese poetry, but there is always a Cheshire Cat smile in them, an irony, or more precisely—perfidy. Where is the tree, the foliage, the Turkish baker with his baklava?

Morgan works not simply to forget herself, giving herself completely to the work, but consciously forgetting herself, trusting to her pencil and the lighting-like gesture, procuring from the subconscious the idea and essence of things. According to Jung the power of the subconscious is God. That is why the pencil, touching the snowy virgin soil of the paper draws light-carried tracks, and in Movement of insects on a summer night at the end of July in 1995 in Bergamo, Italy, each line is filled with the night's blackness. Perhaps this is not God but the different insects in the measure of their force drag with their legs, the sombreness of the summer night; and the night dances its ornaments onto the tonally warm and textured handmade paper from Nepal. The 1002nd night. At the same time, the impetuous flying phantoms, like the traces of breath on a window pane: Edwina Horl's dress gently lifting and falling in the afternoon breeze in Scheffling, Austria, July 1995 and the journey of fire licks following Martin Dickinger's papier-maché sculpture burning as performance, July 1995, are generated by the sparkling stratum of flashing strokes. Such a mysterious, luminous fabric or irregular asymmetrical lace would look very fashionable today. The question is where do you go to find it, this primal cloth of the artistic image with its ethereal cellular structure which is impossible even to define in words but which is the skeleton of figurative and abstract art.

In the jazz of Anthony Braxton the movement of his hands gives birth to seven graphical galaxies. They form in the white vacuum of the page, seven furious graphite staccatos—elongated, velvety like a bumble bee, woolly textured spots, embraced by the scaffold of thin elastic lines, each a graphic temple and in each the sacred service. The graphical herbs are boiling and the last vestiges of rococo, baroque and gothic, boil to marks and chiaroscuro—thicken into abstract expressions and unknown meanings which drift eternally in the endlessness of artistic space.

In Anthony Braxton's Composition 193, Morgan O'Hara with her instruments was a member of an orchestra sitting inside the music hurricane as Turner was in the sea tempest tied to the mast, each fixing another artistic event. These are true black fireworks, a squall of needle-like lines tightly knotted in bunches—zig-zags of black lightning—black bursts from which little clouds disperse to the periphery—and in the epicenter, sheaves of black rays rise and melt into the heart-core of graphite magma. The stormy movement of musical hands conduct the growing jazz mass and the pencils, not bearing the impetus, are wrenched from the hands of the artist, fall down and roll away. She tames them in a musical way, in each hand a row of organ-like little pipes which create the solemn graphical installation, unfolding the extensive image of the graphite shaft, fine and breakable, tightly tuned to the world in its eager loyalty to the tremolo of nature, not defended against fracture.

This drawing could serve as a musical score\* but it seized the artist and led her to turn toward an experimental field. She united these split forms into a single silhouette which became a powerful, nearly real burst of ink splashed on the wall. Actually, it became a monument to mutation of form, a sudden metamorphosis. Form is not so frequently indulgent with those who throw this challenge. The new formation, enlarged, is transferred to the wall without any loss of spontaneity.

The KEYBOARD STUDIES follow as a logical sequence. Movement is transposed to old Czechoslovakian score paper which, by its nature, attunes one to music. In addition, there are many aesthetic qualities: each

page has a different tonality, proportion of staff lines with their different thicknesses and different spaces between. This is a true classic of minimalism or an echo of the striped serenities of Agnes Martin. However, here it is impossible to imagine how an artist sitting in the posture of Vermeer's lace maker habitually "weaves" her grey cloth with the only difference being that instead of bobbins—a battery of pencils is held in each hand. In these new permutations, Morgan O'Hara decisively, rather pitilessly, pours on three layers of ink, aspiring to the highly polished black finish of the grand piano and in the end produces very black formations with strong contours. Possibly just a playful moment? What happens if one generalizes? Briefly, this is again the teasing of form but this time in the quiet atmosphere of parallel lines which are peacefully awaiting notation...a calm before the disaster? Suddenly this stillness contorts and yawns into hideous torn chasms, ready to engulf everything. One literally hears the ominous cracking. The musical flatnesses are ripped open and other non-musical limits of space appear.

Not less elemental are the images of THE SHAPE OF DISCOURSE: precisely, gesticulation at the podium in the auditorium of writers, philosophers and poets at work. There is here the same rational principle of generalization as in the KEYBOARD STUDIES. This series of splashes of black graphical plasma is an expressive embodiment of the gestures of orators, most dense clots of intellectual and emotional energy. Like some inner organs with all vessels derived from the organism for a new environment, condensing and gaining weight as chiseled bronzes, poured, but not by any hand. They distend and agitate the impeccable limitlessness of the page making it tempest-like. Leaving the power of titles, we suddenly see inside this cool cosmos the mysterious black holes where all worldly information and all emotional energy impetuously revolve for eternal storage and eternal transformation in the name of new universes.

Note: To my great delight and satisfaction this actually happened in a fall concert in 1998. It happened to a perfect degree when a serious devoted young student turned the pages of these drawings as Anthony Braxton played from them as from an ordinary musical score. Tri-Centric Festival, September 24–October 3, 1998, Greenwich House Music School, New York City.

# THIS ART IS NOT A SPECTATOR SPORT

SCHUYLER BROWN • NEW YORK • FEBRUARY 2012

I study dance with Gabrielle Roth, the "Urban Shaman" in New York City who developed a dance practice in the 1970s called The Five Rhythms, a moving meditation or a hippie rave (take your pick). Through dance, the student touches sources of inspiration, sheds light on the dark, and learns to participate fully in life through the body. The practice is not about skill or precision, but it does require courage. Every week, students of all shapes and sizes, representing all walks of life and backgrounds, get on the dance floor and sweat it out together.

This being my primary experience of dance, I find it strange to watch dance as a member of an audience. Of course, I've seen many dance performances over the years and I've enjoyed many of them in a passive kind of way... more as entertainment than art. When I see dancing, I want to be doing dancing. But, this is generally discouraged during formal performances.

When I first saw O'Hara's Live Transmission drawings based on dance, I was electrified. I found myself enjoying these images of ballet more than I remember enjoying actual ballet. I've never seen Irish set dancing, but when I saw these images, I felt myself tapping my foot in time to the music in the pub. I like dancing to music with a strong beat, but the drawn images of Butoh gave me a new appreciation for slowness, an exquisite attention...

What strikes me about O'Hara's work is the seeming absence of self. Her work is an invitation to experience. First, she invites us to go on a journey around the world. She has done Live Transmission drawings on five continents and hopes to get to all 9. I accept. Second, she offers tickets to obscure and rich events that define the cultures we're visiting. I accept.

Third, she opens my inner vision and invites me to experience the performance in my imagination. When she draws dance, she offers me a chance to dance. I accept.

Like a Morse code for art, Morgan O'Hara has created a system of lines, dots, and dashes that encode the act of creation. In order for the transmission to be complete, it must be decoded, done in the act of receiving the message. What is received through her encoded image is absolutely personal because it is dependent on what we each bring to the work. The artist steadfastly refuses to assign meaning to her work. We can ask questions: "Do you ever experience the emotion of your subject while you are drawing?" or "Did you like this (or that) dance performance?" She just smiles enigmatically. The question is beside the point.

It occurs to me that THIS ART IS NOT A SPECTATOR SPORT. In its most potent form, any act of creation is a selfless act. The artist creates with the understanding or hope that the work will be received, experienced by the receiver actively, not passively. Art demands something of the creator and the experienter. It is communion. It is dance.

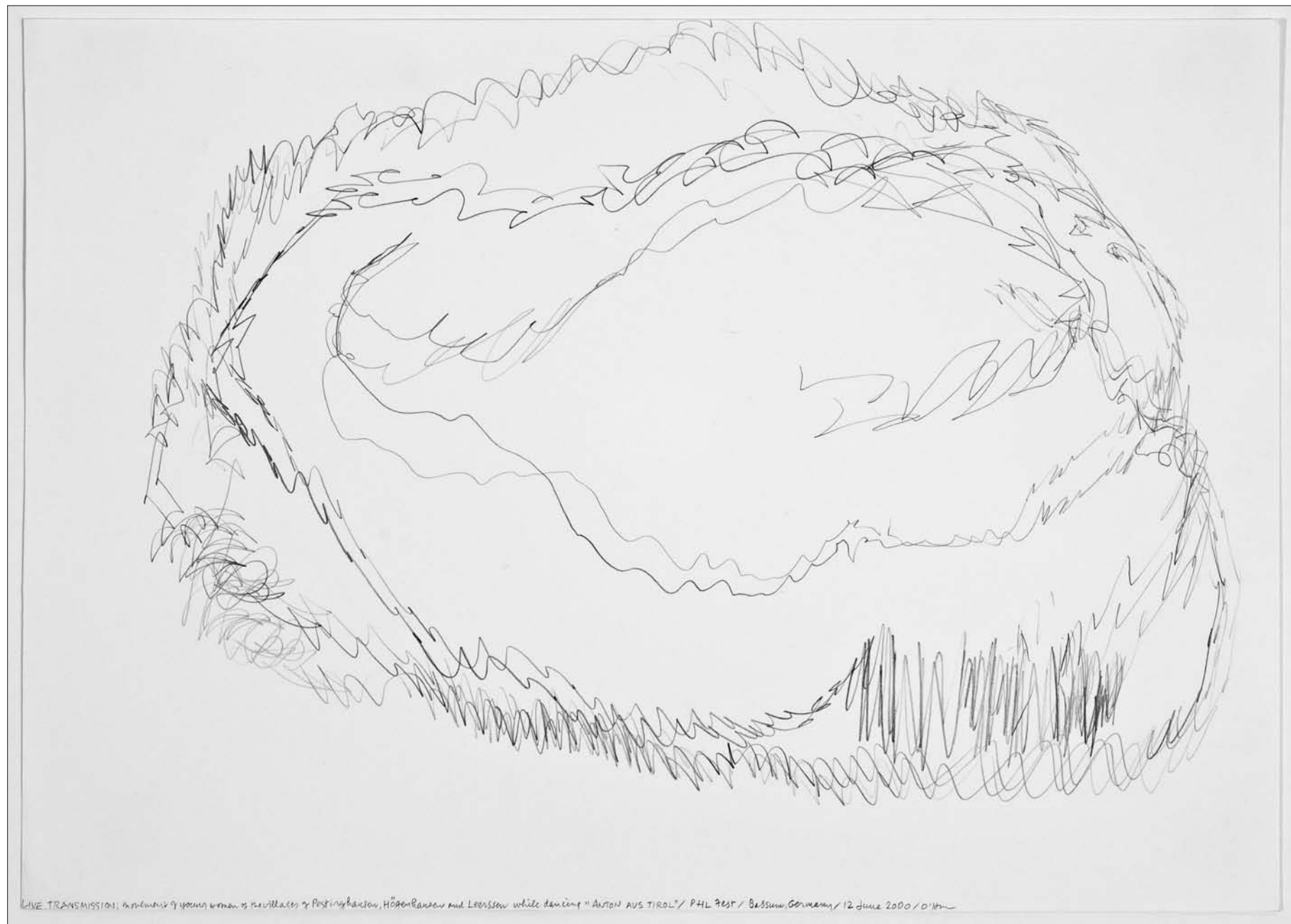
Dance can be an avenue to profound self-understanding. These drawings invite us to dance with the lines, with the artist and with the dancers themselves in places and ways beyond immediate experience. Though we are still when we look at them, the mind and eye trace the leaps and pirouettes on the paper with the same vigor and rhythm which inspired them in the first place. We are engaged. We feel important. This work cannot be completed without our active participation.



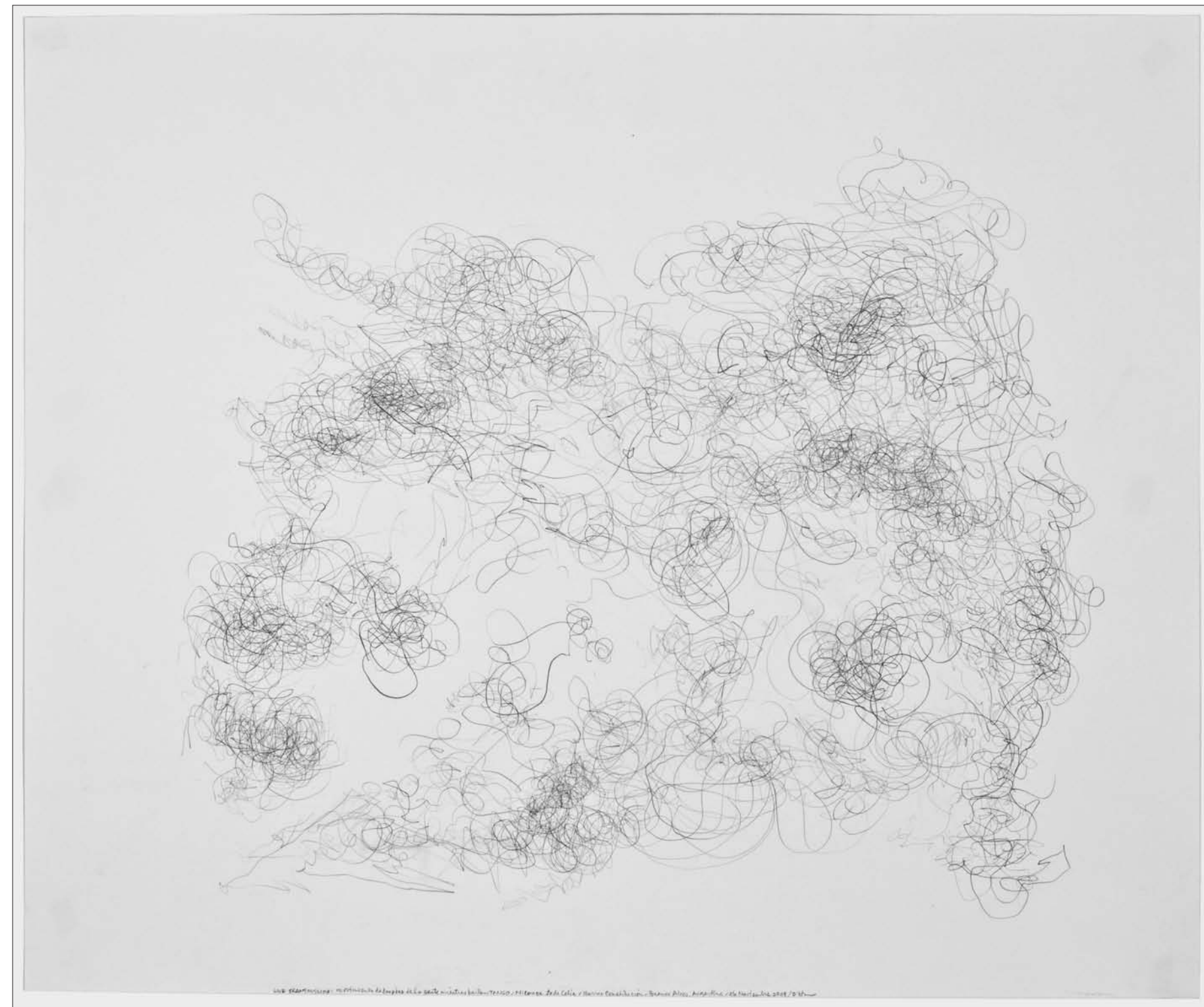


# TRADITIONAL DANCE



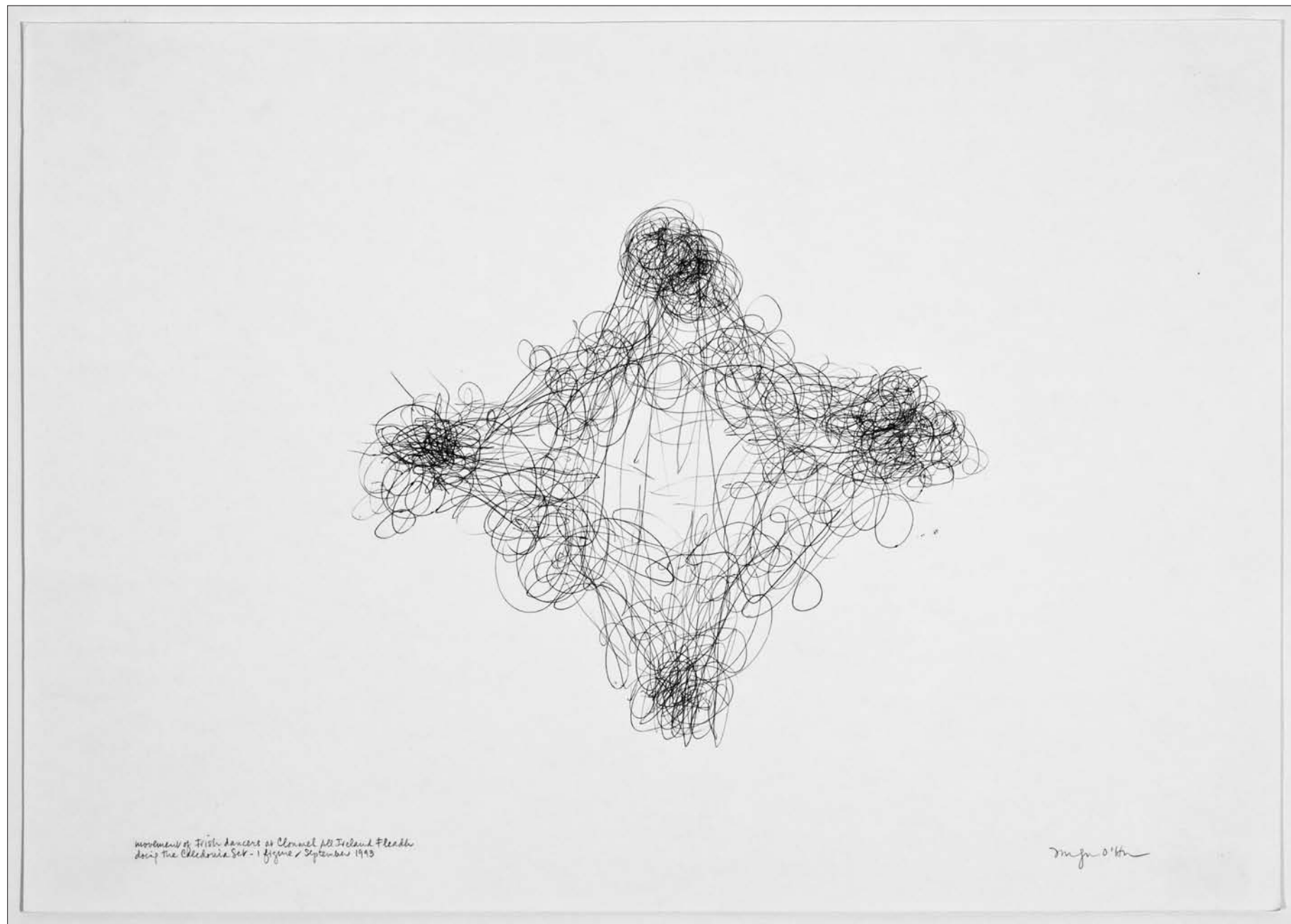


LIVE TRANSMISSION: movement of young women of the villages of Pestinghausen, Högenhausen and Leersum while dancing "Anton aus Tirol" / PHL Fest / Bassum, Germany / 12 June 2000 / 0'16"



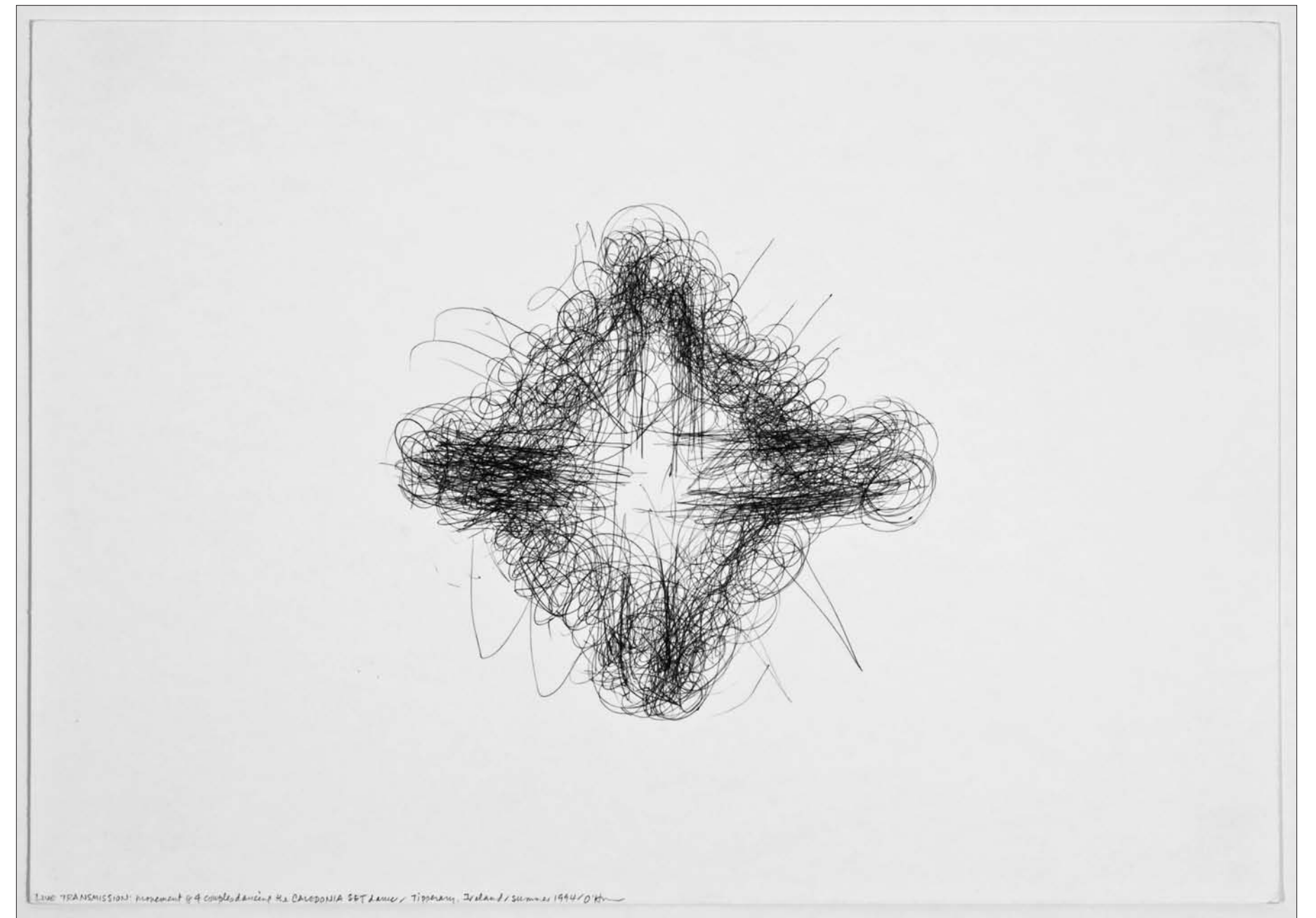
LIVE TRANSMISSION: movimiento de los pies de la gente mientras balan TANGO / Milonga Lo de Celia / Barrio Constitución / Buenos Aires, Argentina / 26 noviembre 2008





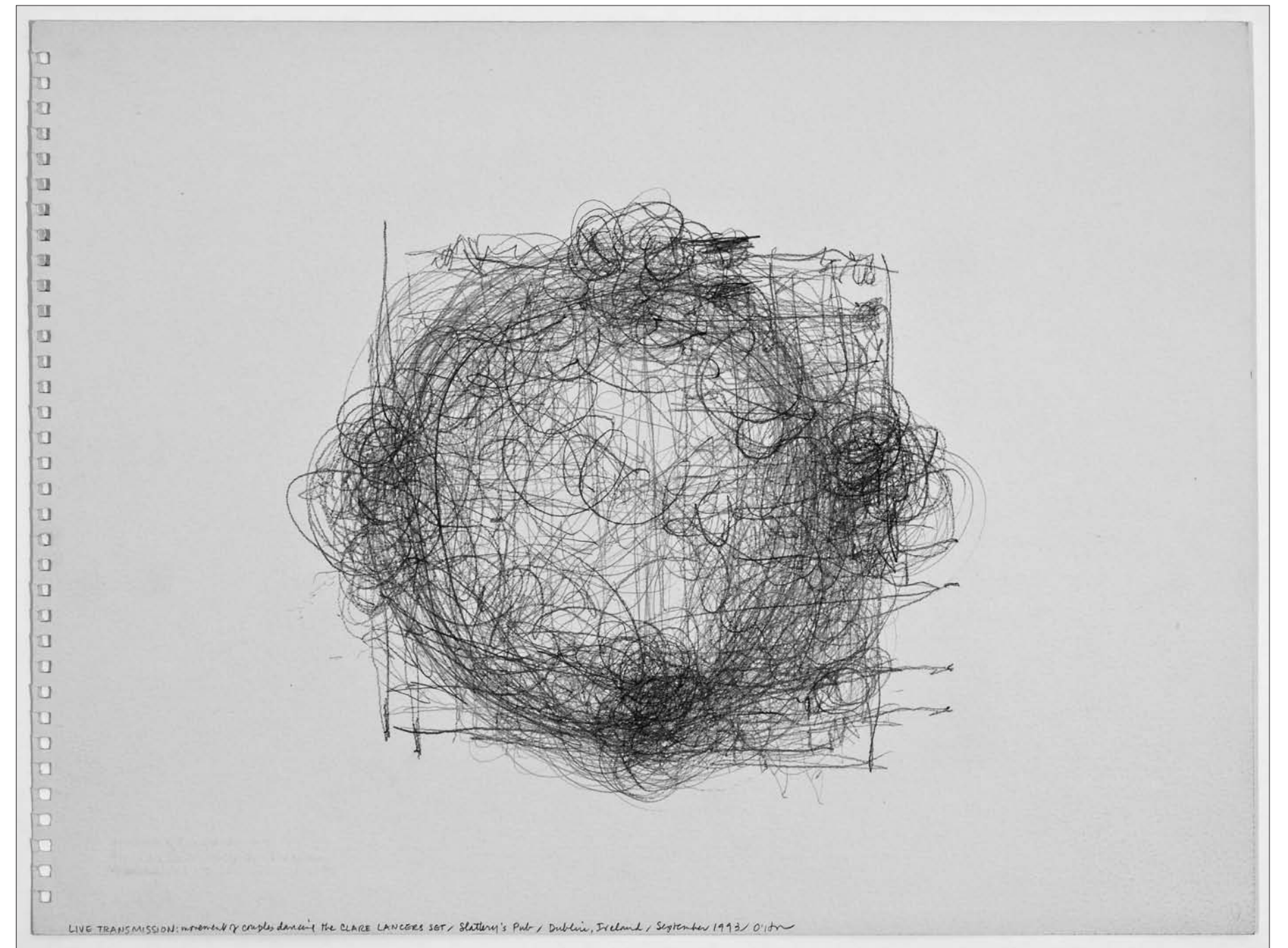
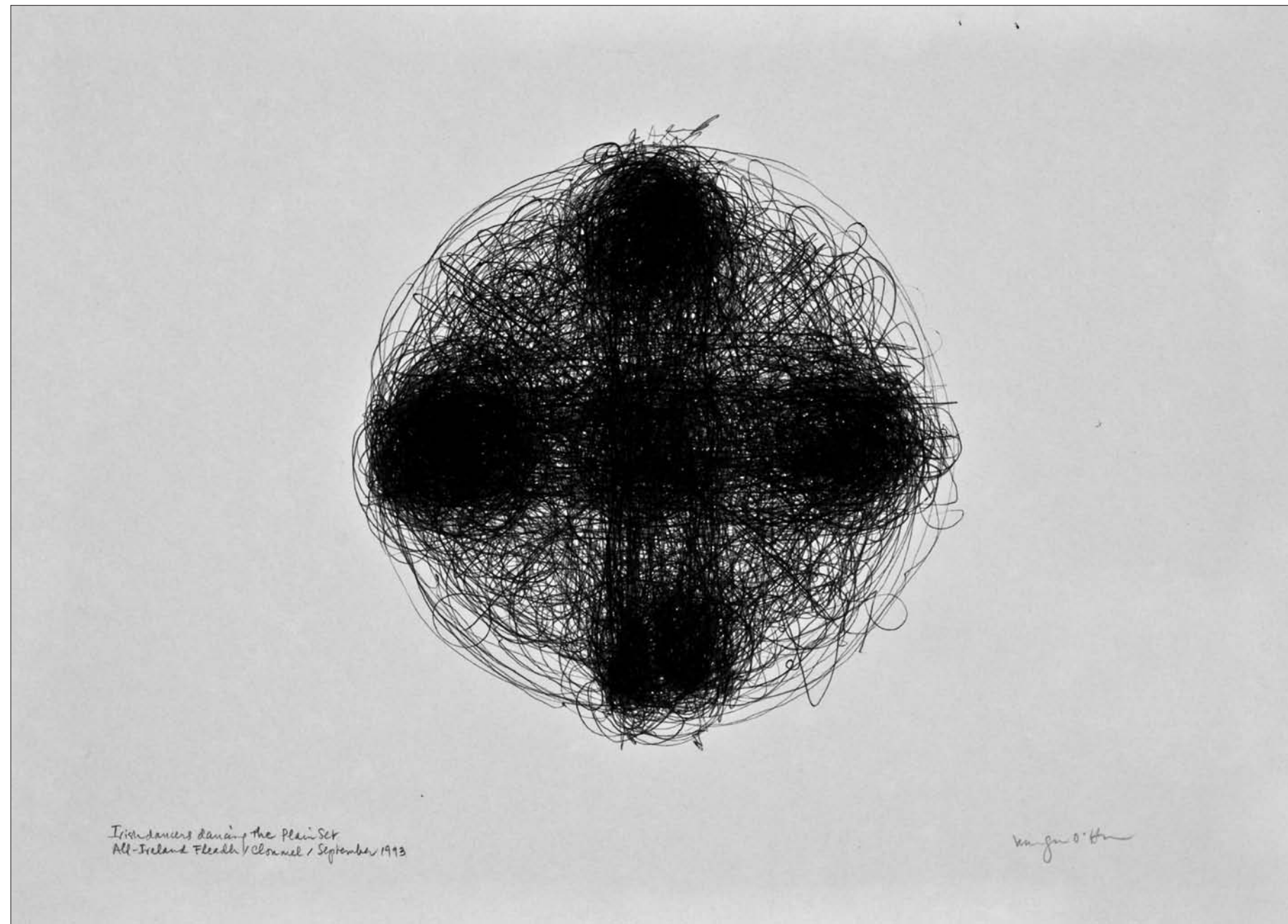
movement of Irish dancers at Clonmel All Ireland Fleadh  
during the CALEDONIA SET - 1 figure / September 1993

John O'Hara

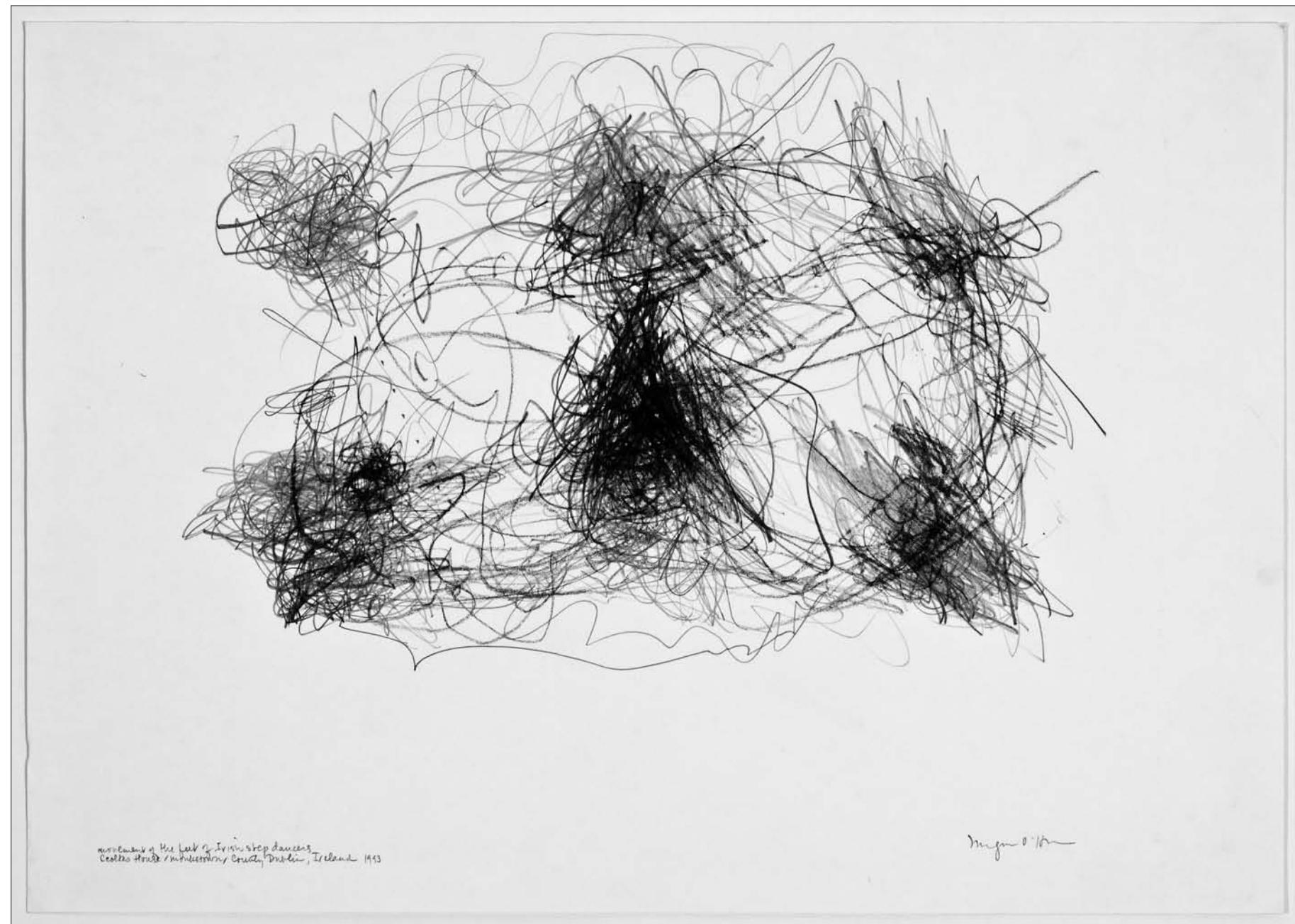


LIVE TRANSMISSION: movement of 4 couples dancing the CALEDONIA SET dance / Tipperary, Ireland / summer 1994 / O'Hara

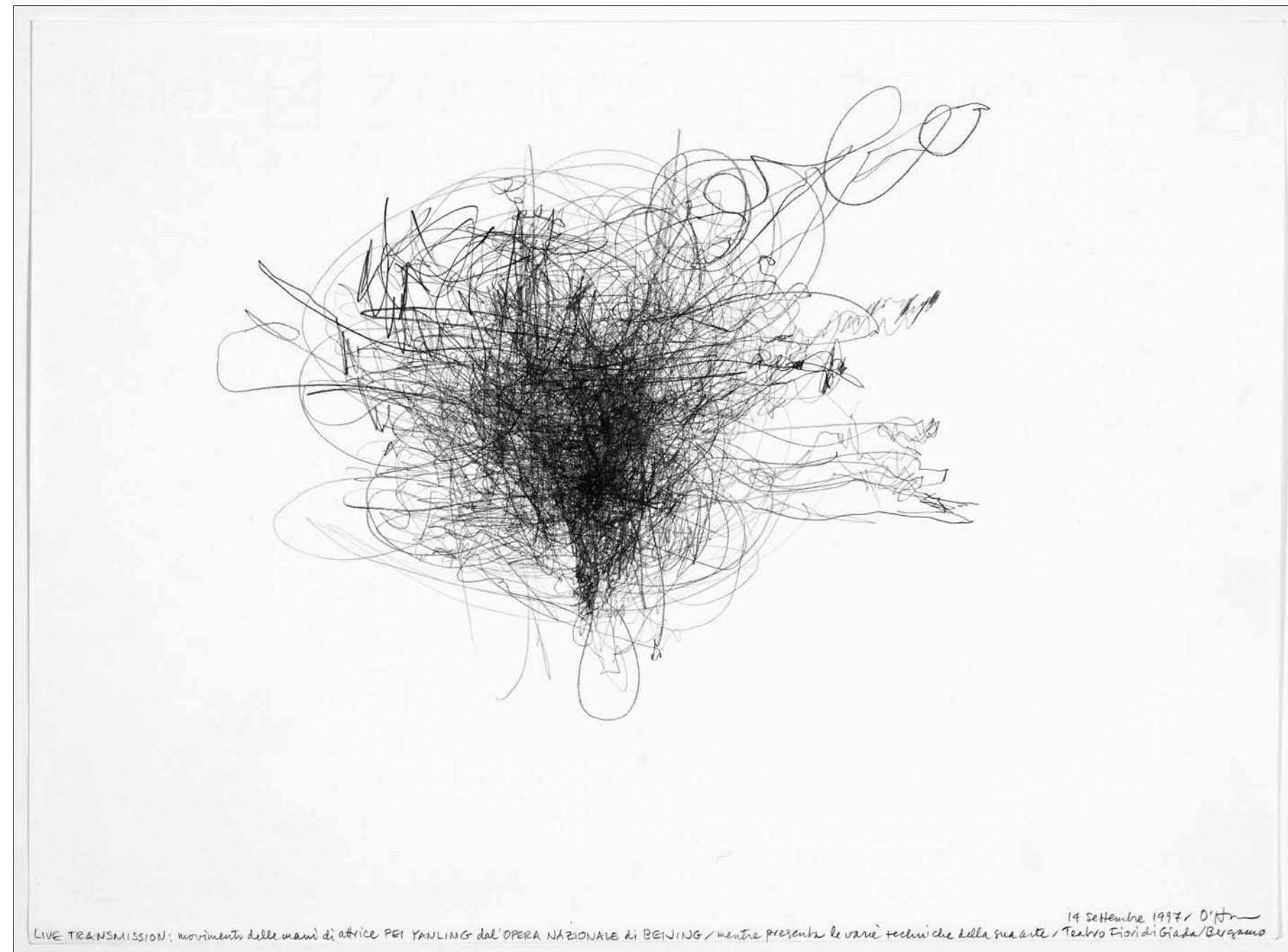




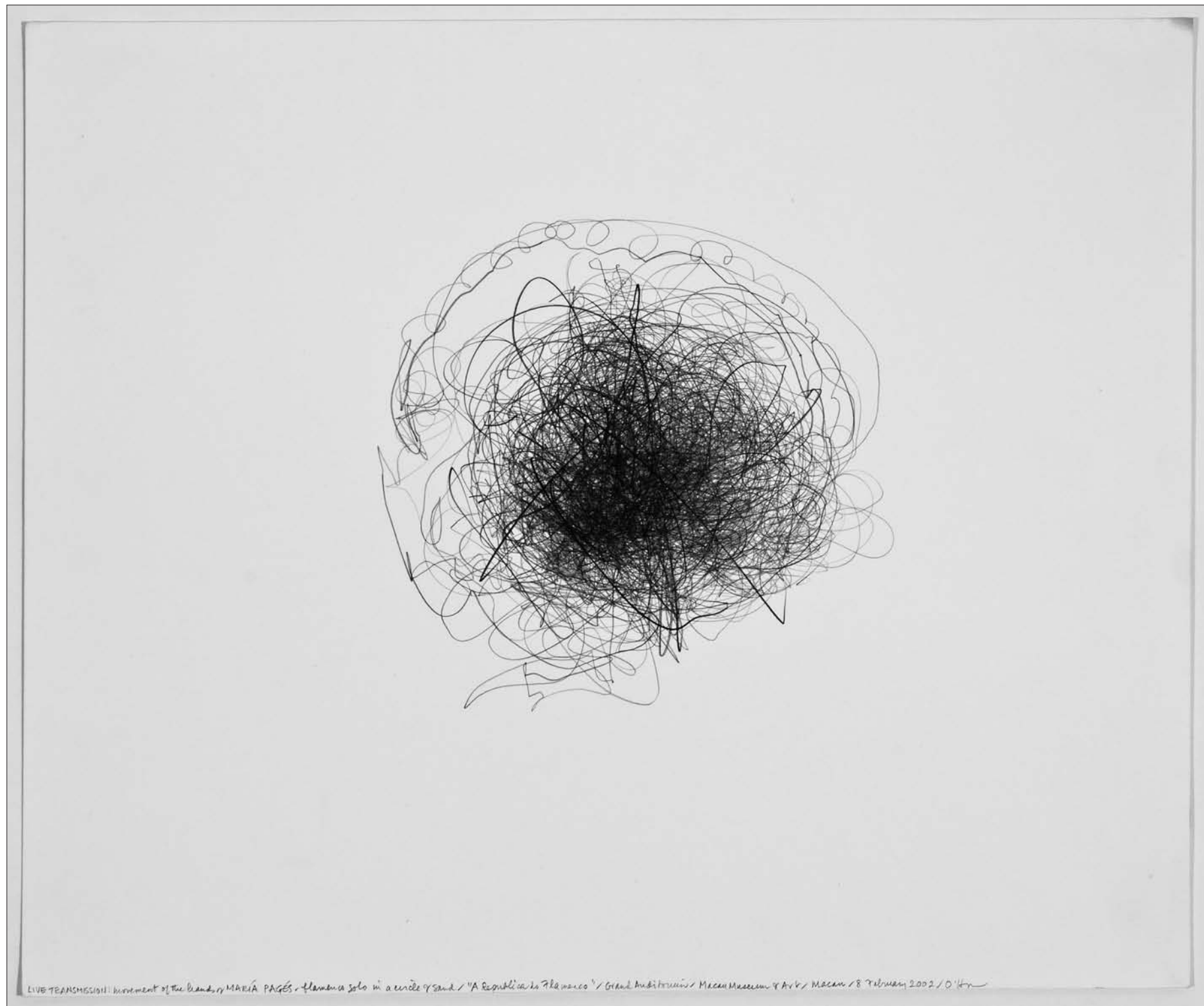








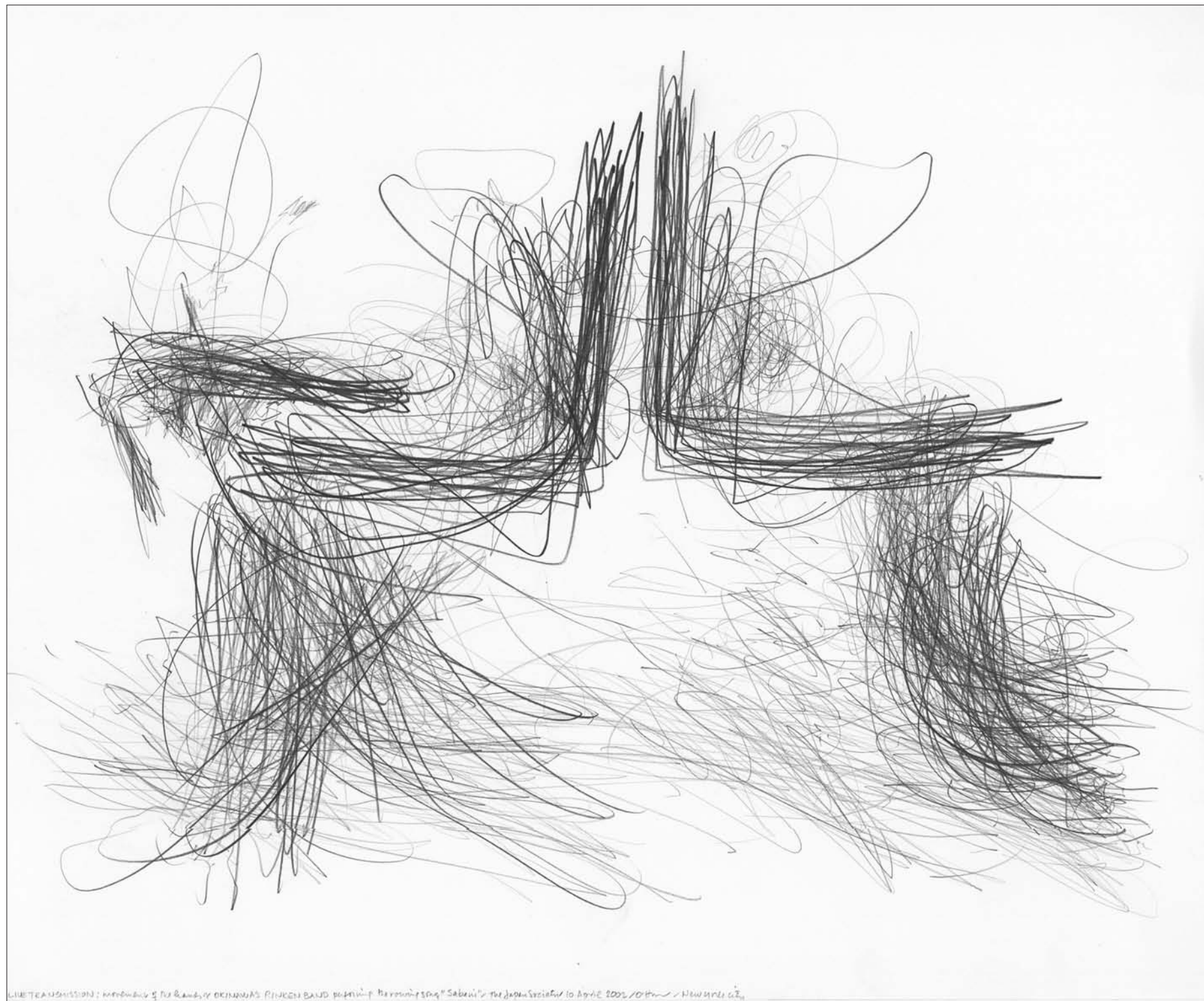












LIVE TRANSMISSION: movement of OKINAWA RINKEN BAND performing the rowing song "Sabani" / The Japan Society / 10 April 2002 / New York City



LIVE TRANSMISSION: movement of KANAKO TERUYA and YUMIKO MIYAGI while performing the OKINAWA KUMIODORI dance "Takedana-Maheai" / The Japan Society / New York City / 1 October 2004 / 01:10



# CAN ADD IMAGE

Choose one from the  
“Pick One or Three” folder

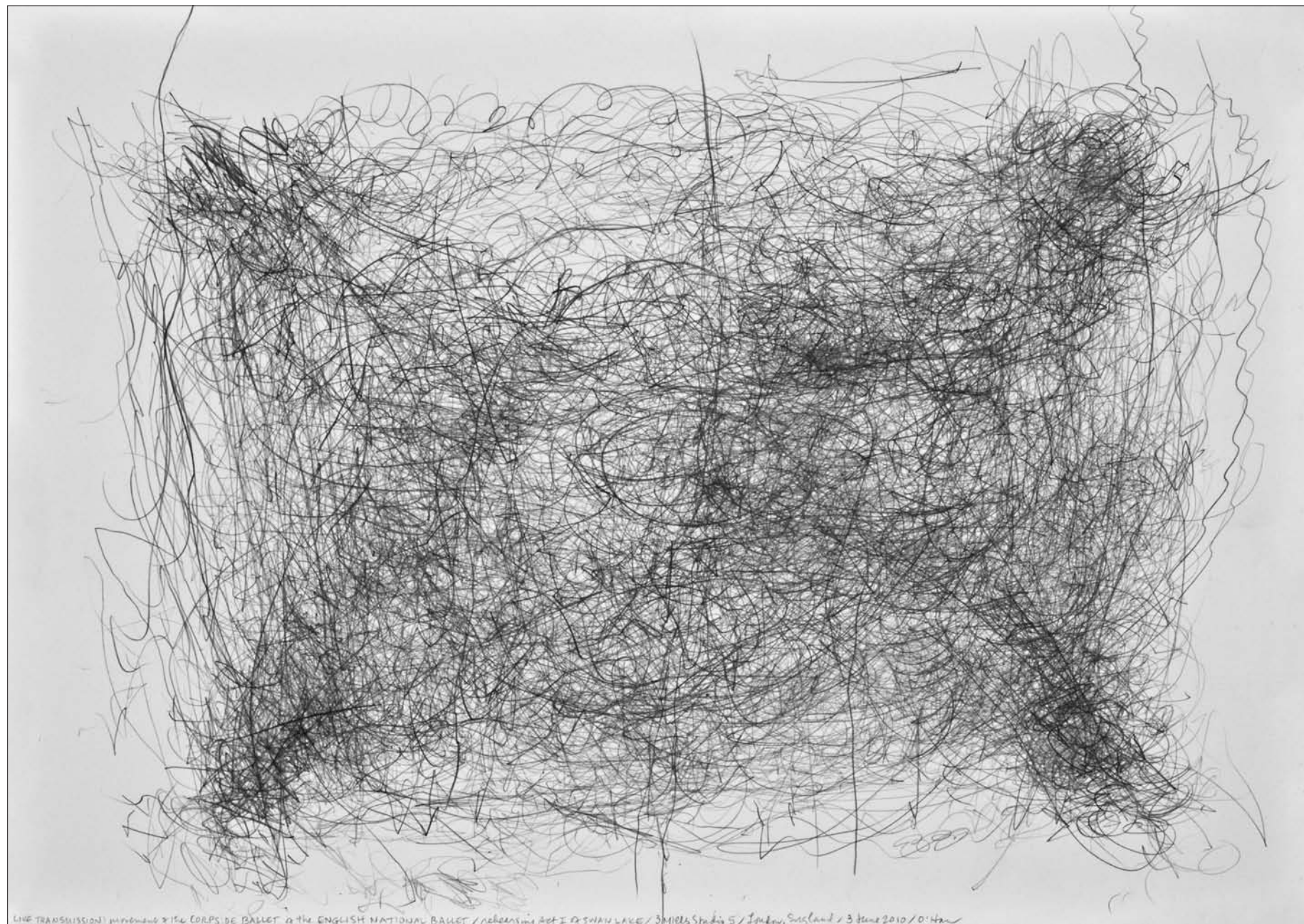




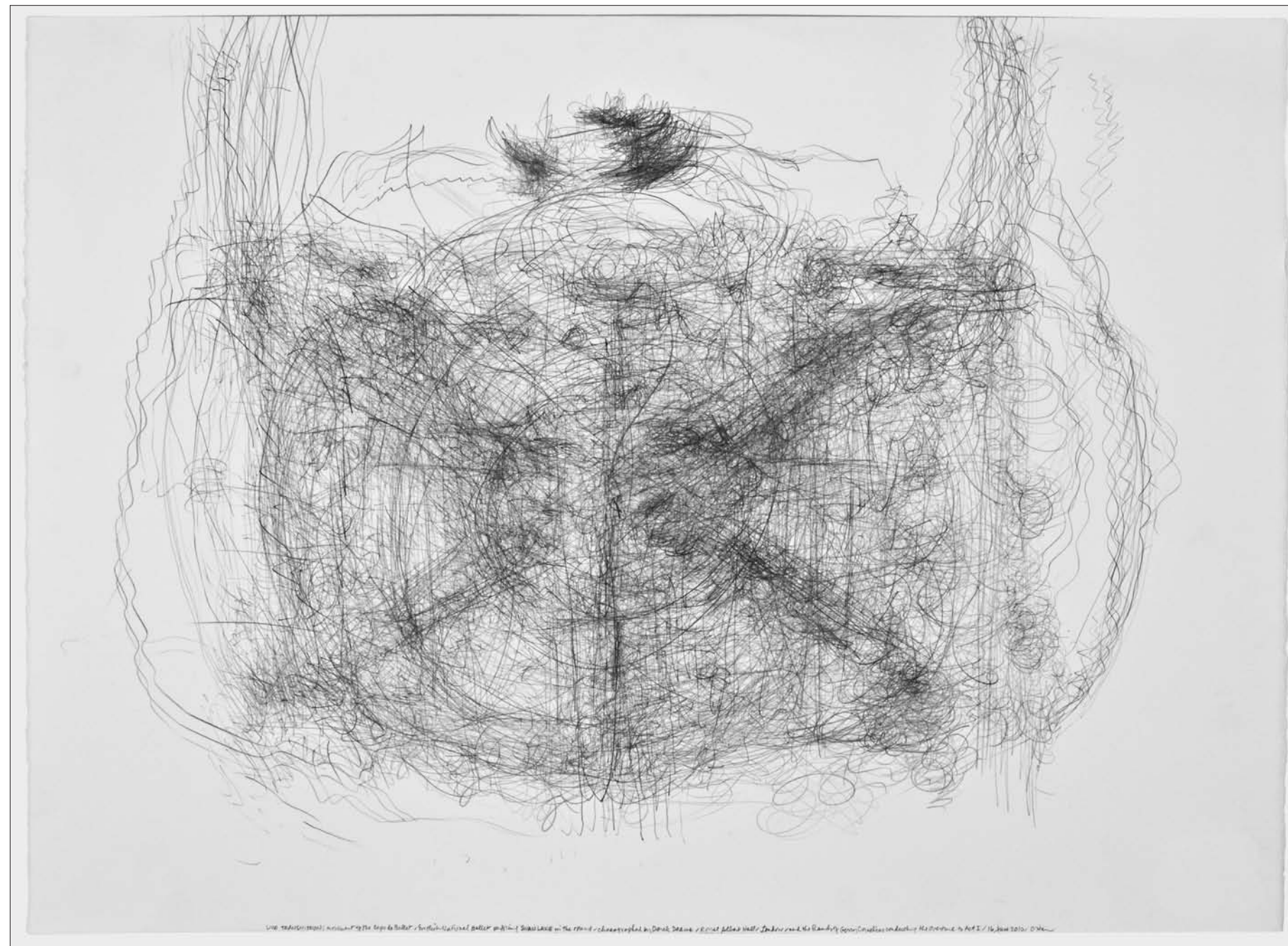


# WESTERN CLASSICAL DANCE



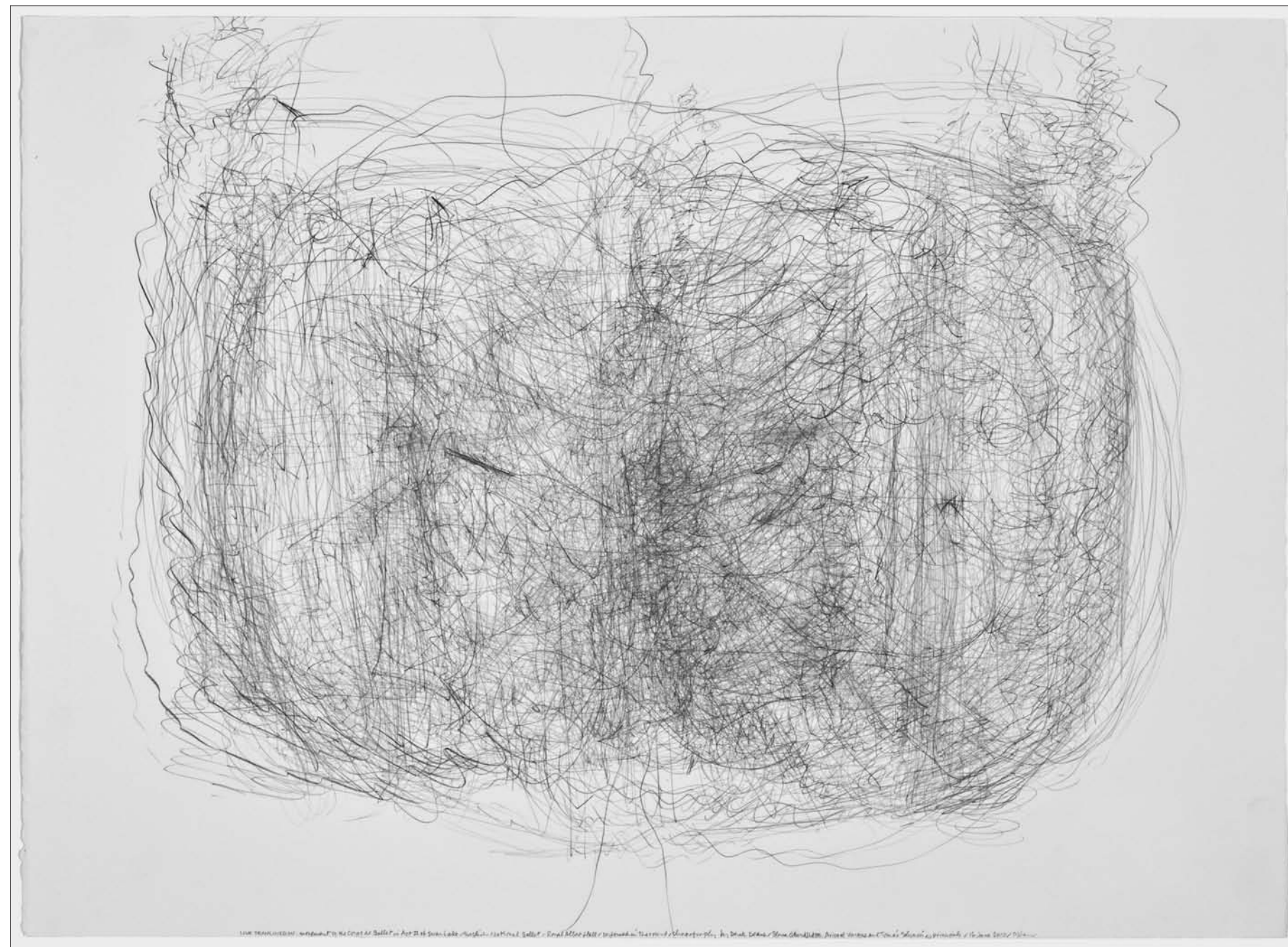
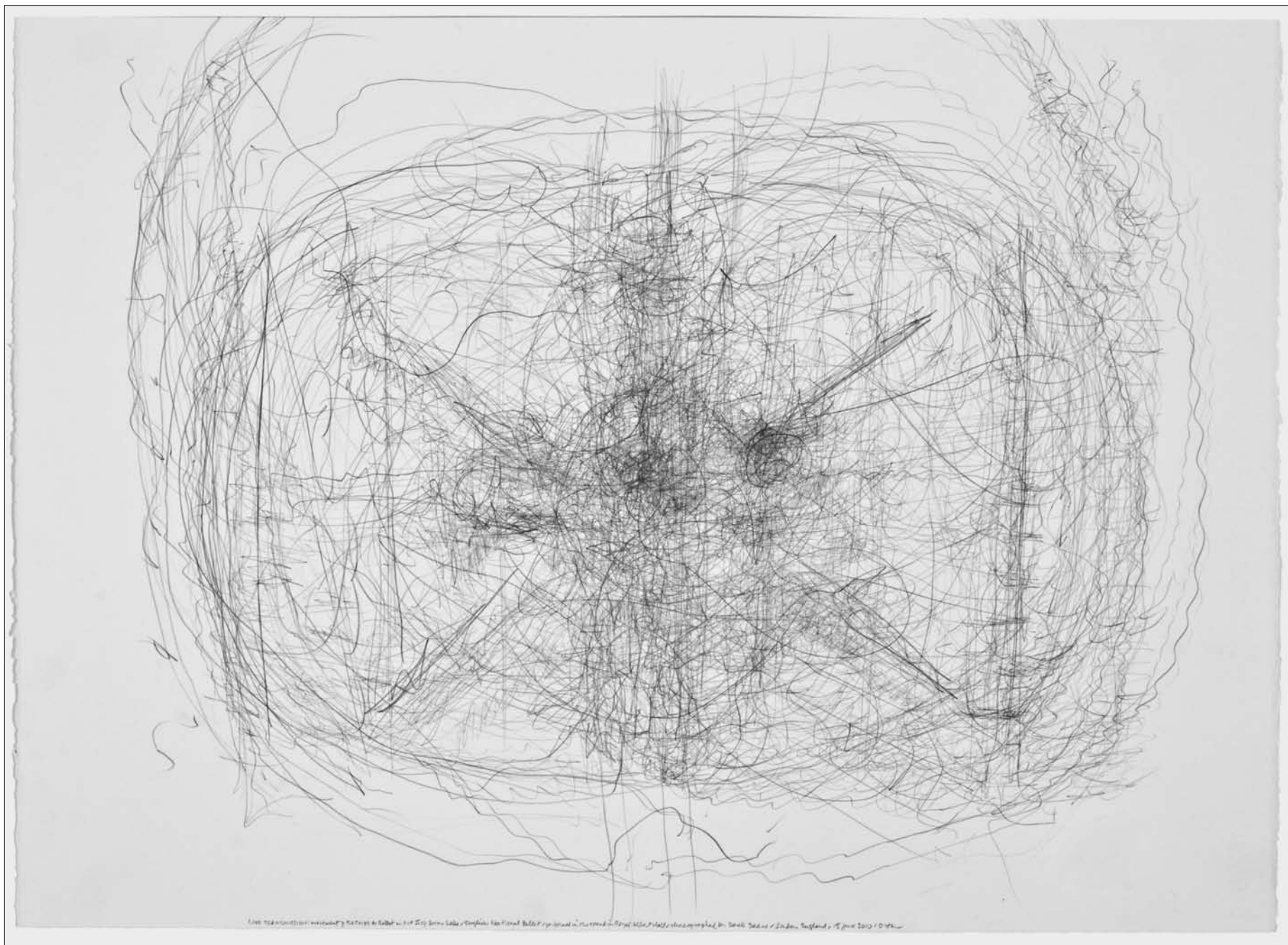


LIVE TRANSMISSION: movement of the corps de ballet of the ENGLISH NATIONAL BALLET / rehearsal Act I of SWAN LAKE / Three Mills Studios / London, England / 3 June 2010 / O'Hare

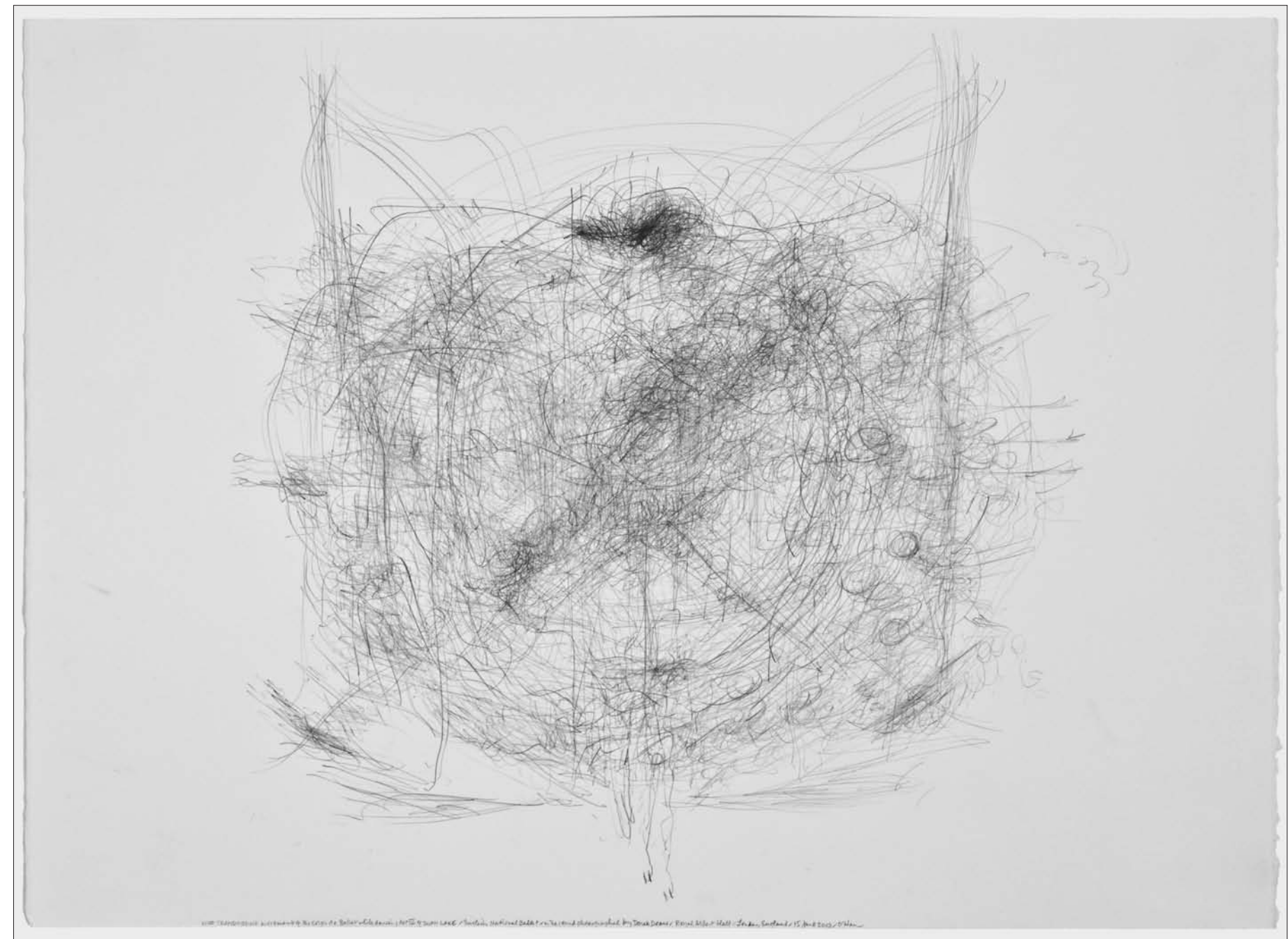
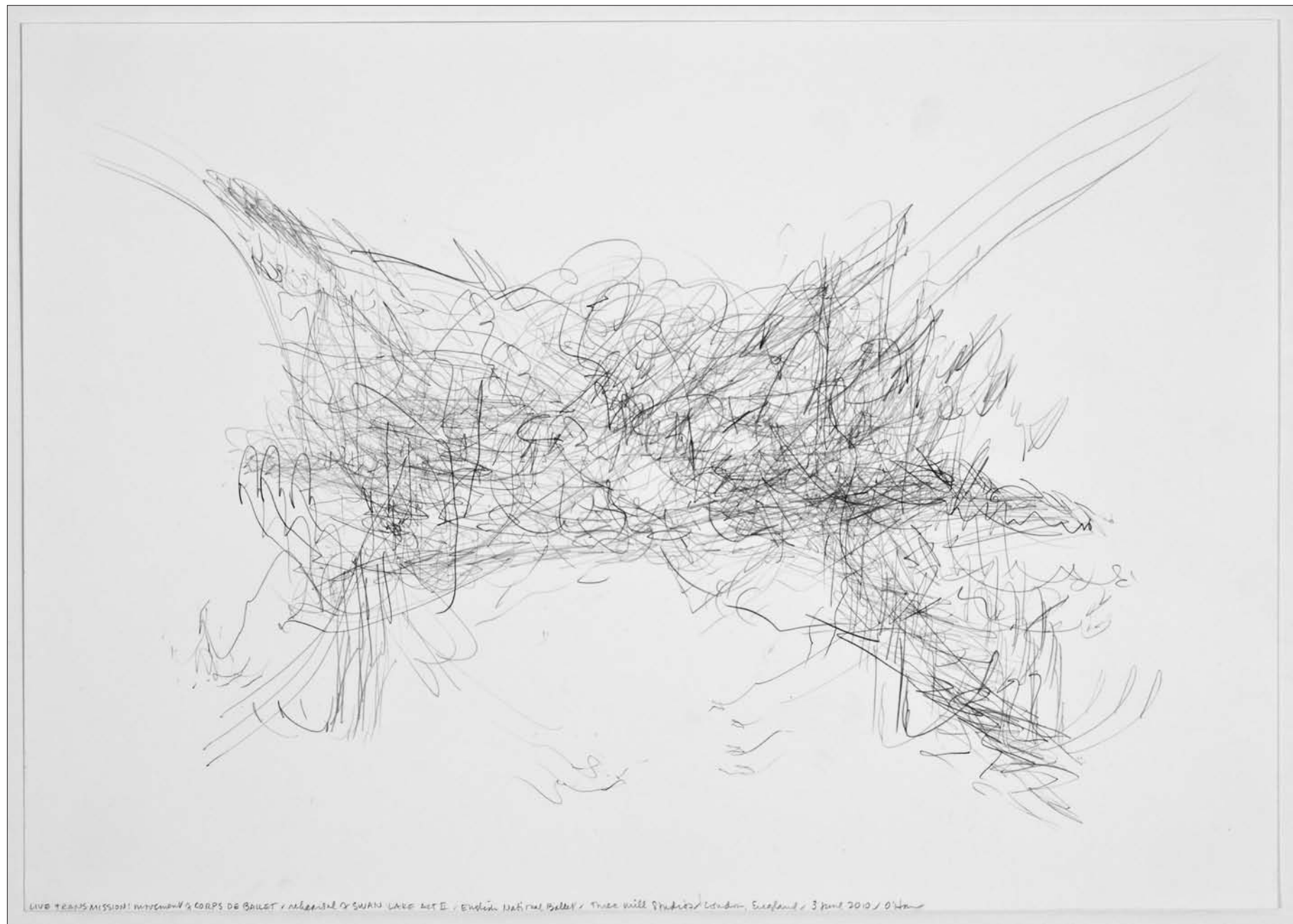


LIVE TRANSMISSION: movement of the corps de ballet of the ENGLISH NATIONAL BALLET / rehearsal Act I of SWAN LAKE in the round / choreographed by Derek Deane / Royal Albert Hall / London and the hands of GERRY CORNELIUS conducting the Overture to Act I / 16 June 2010 / O'Hare

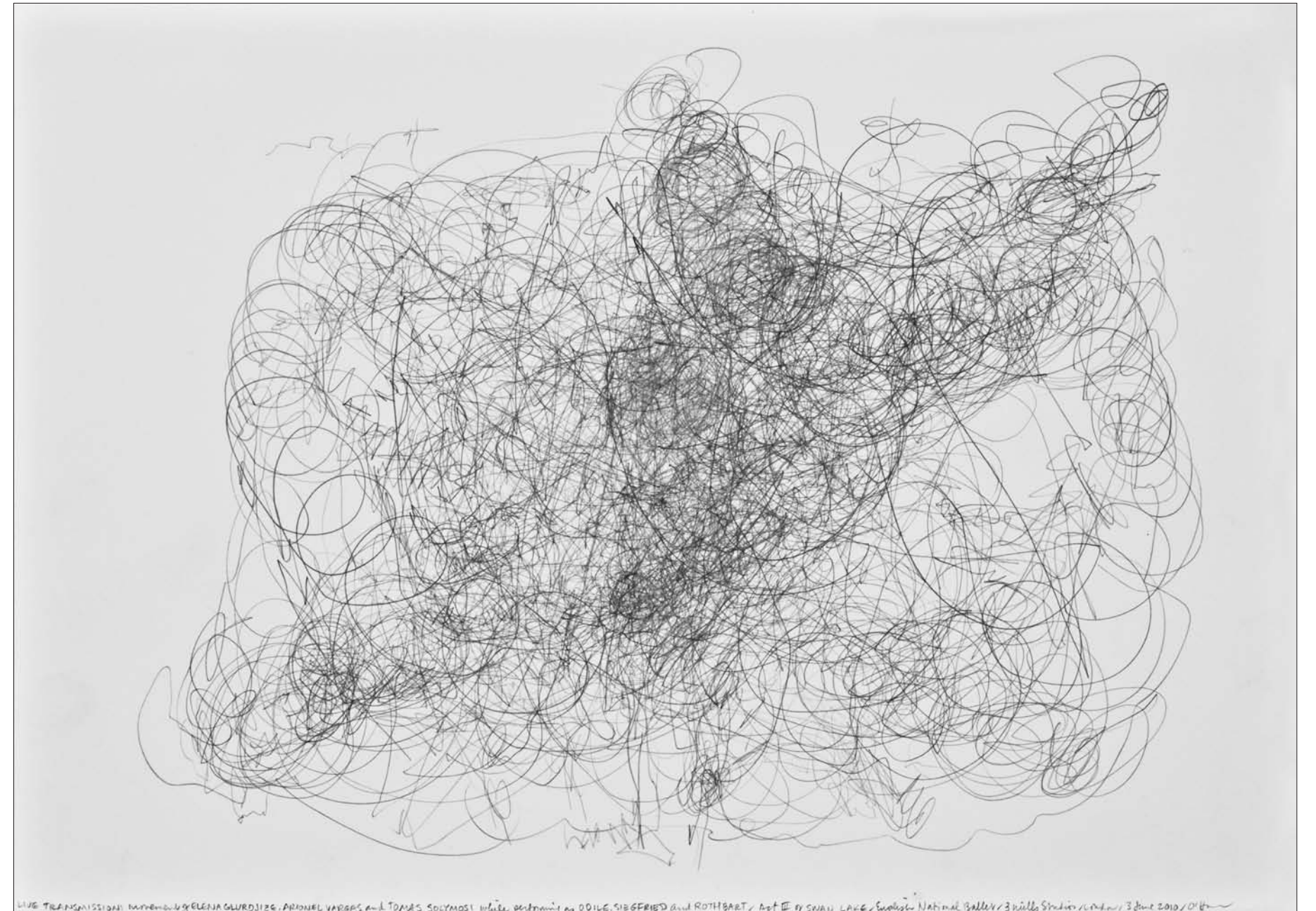
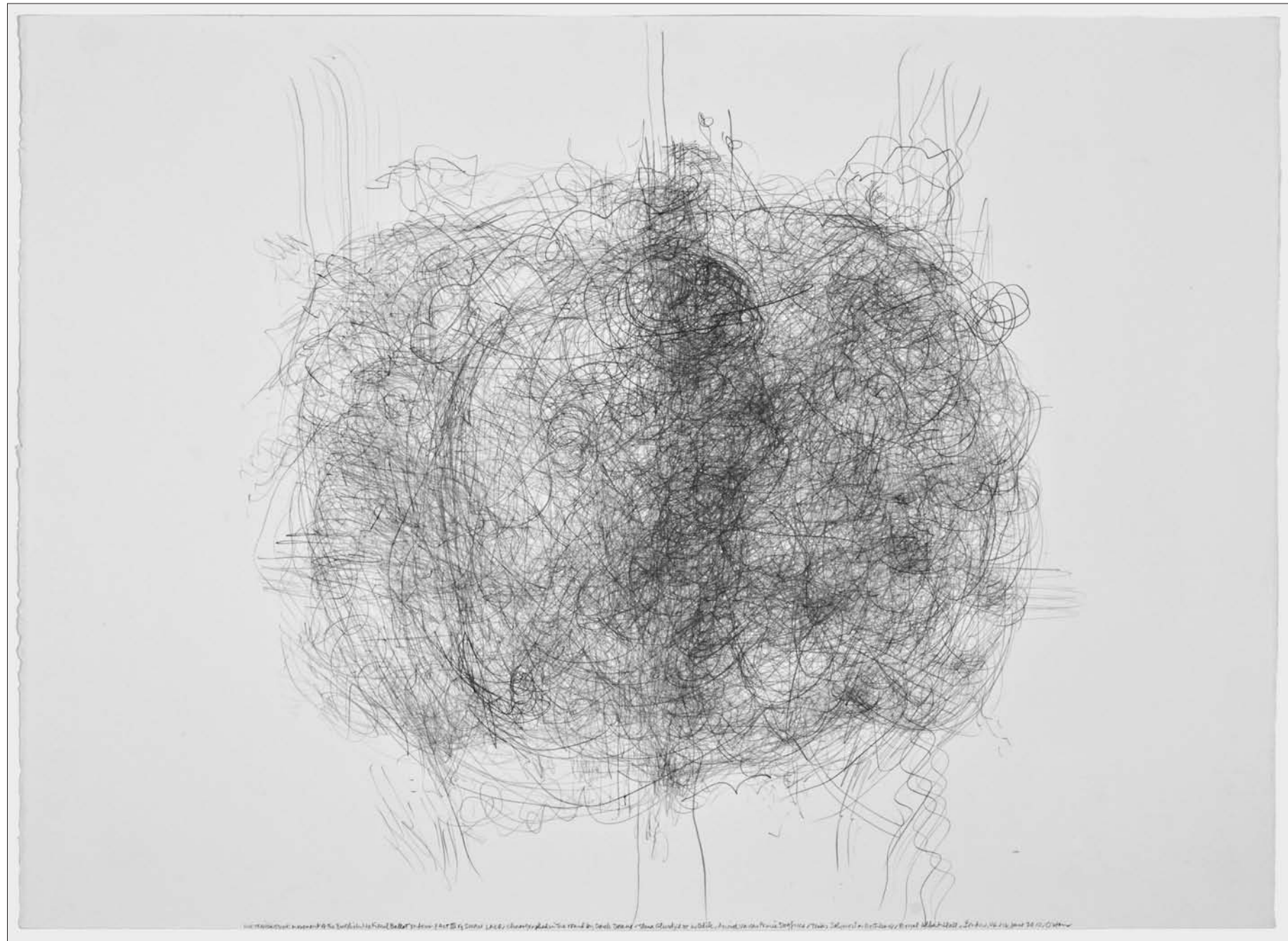




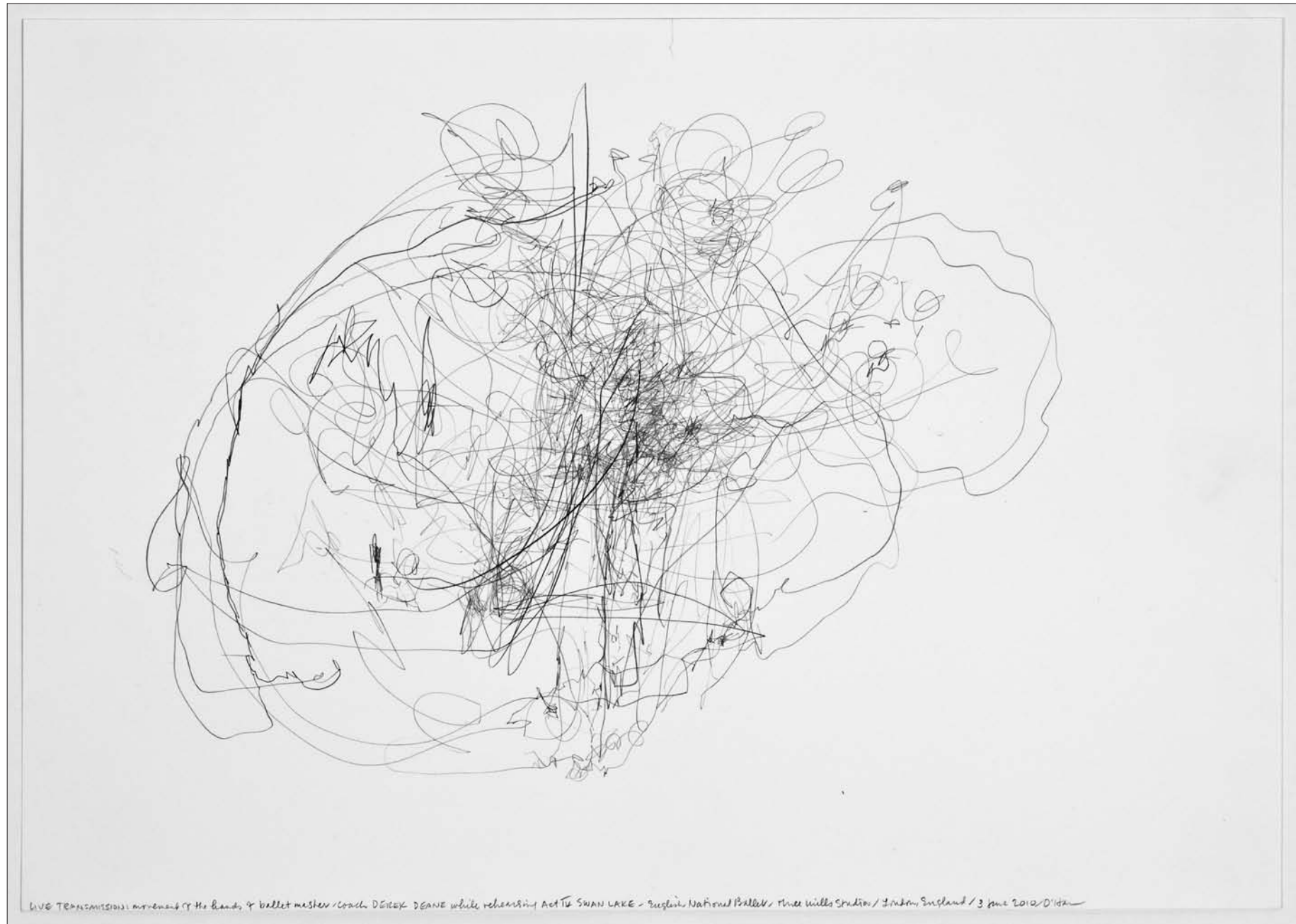




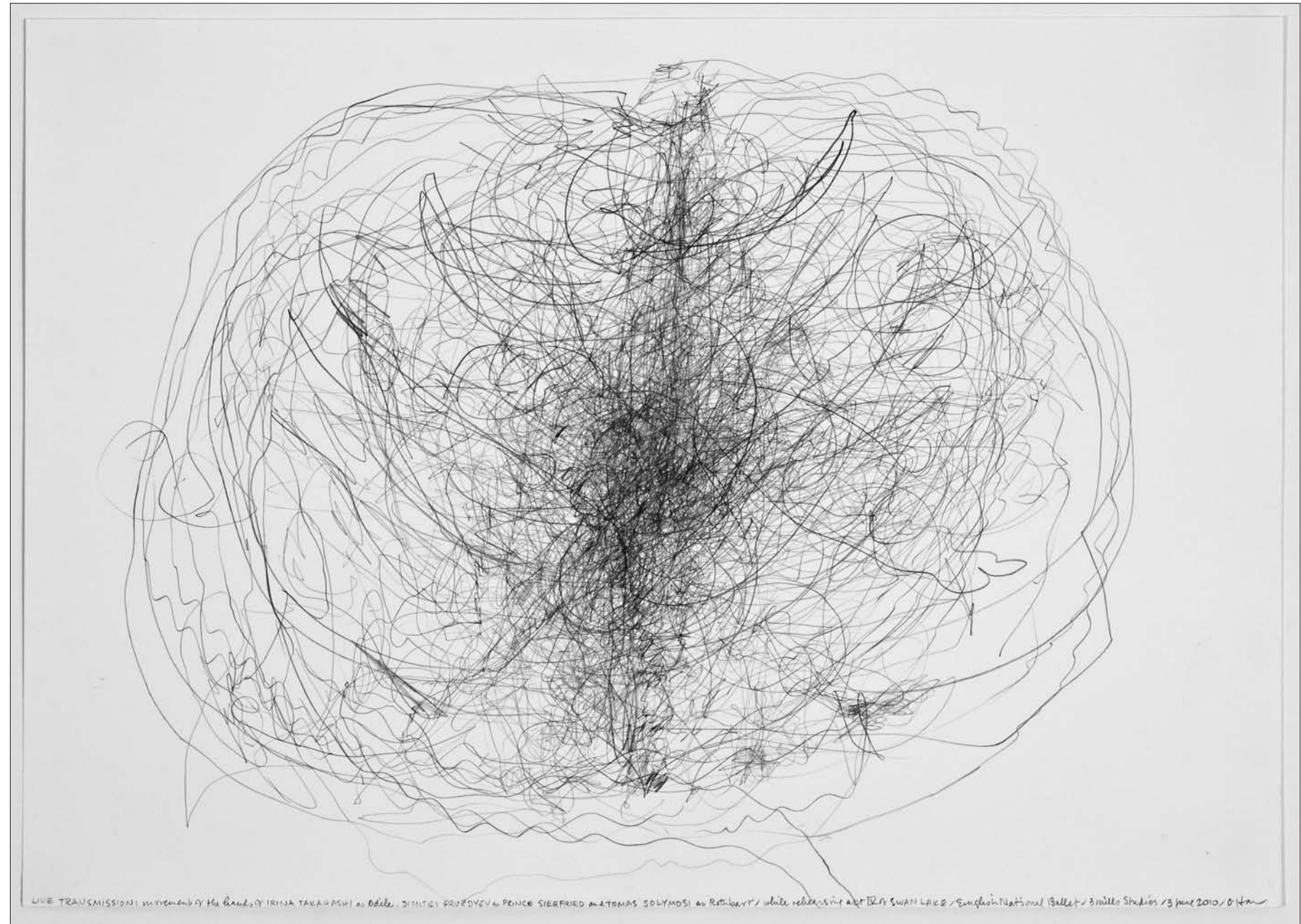






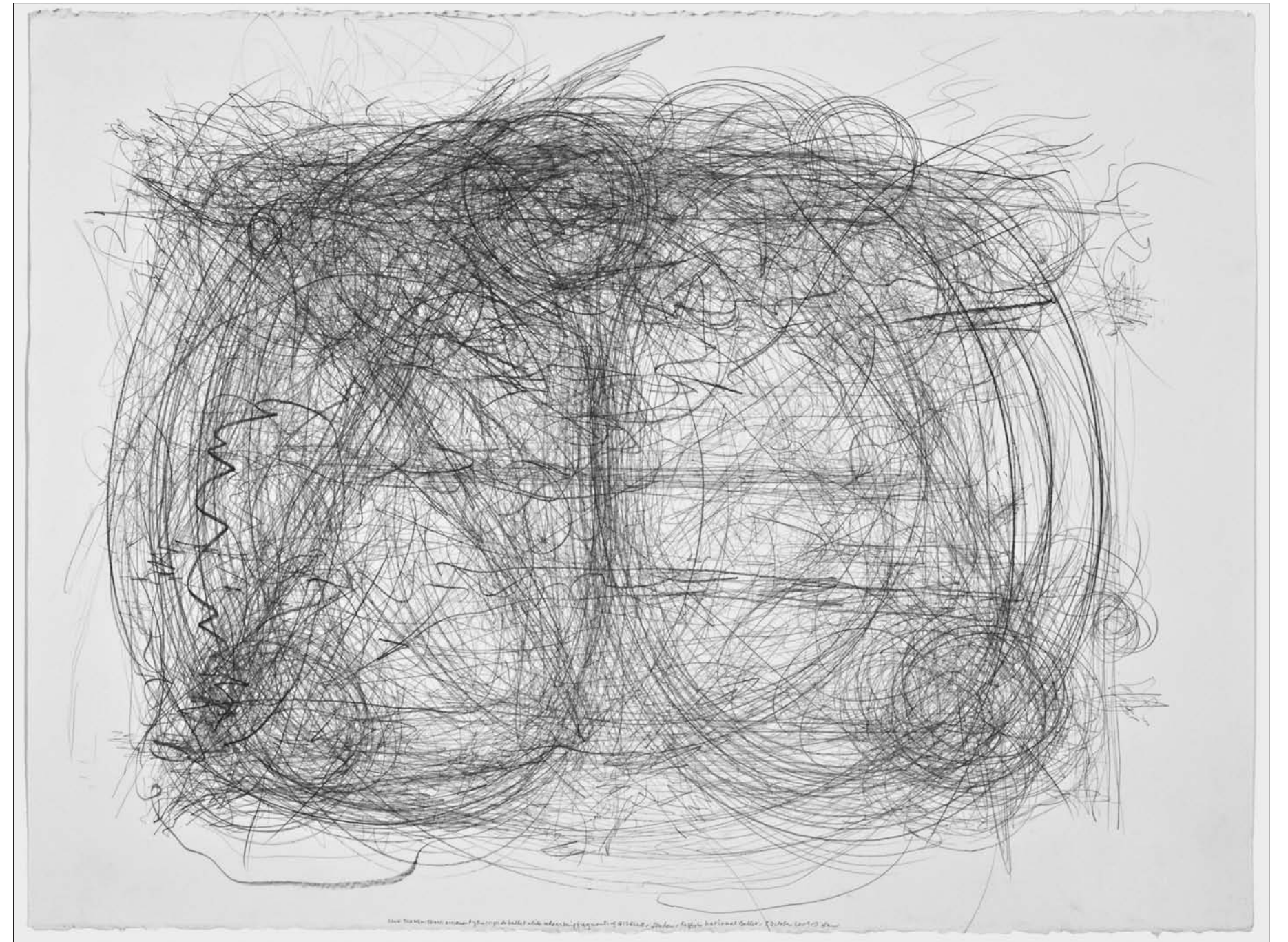
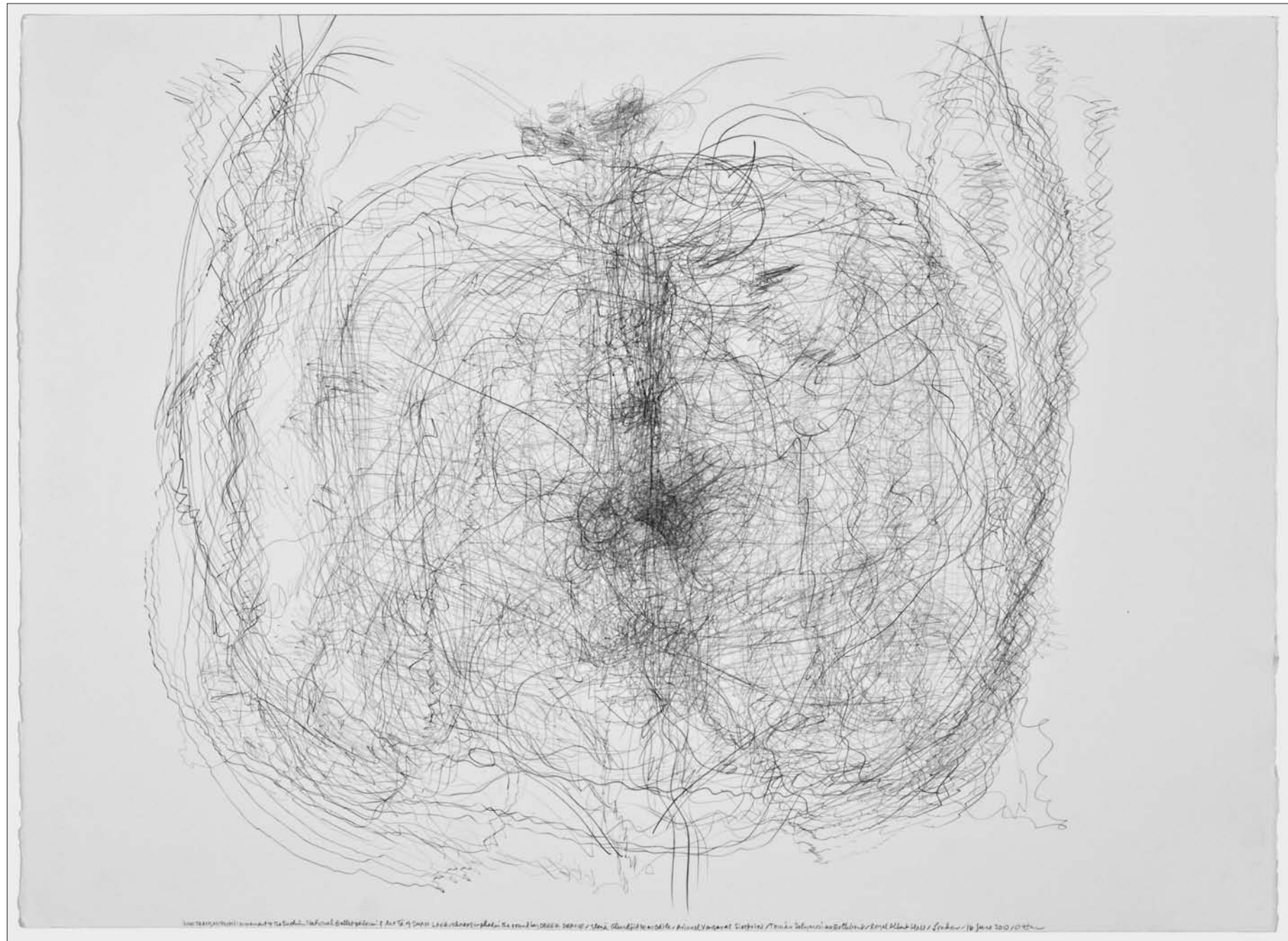


LIVE TRANSMISSION: movement of the hands of ballet master / coach DEREK DEANE while rehearsing Act IV SWAN LAKE - English National Ballet / Three Mills Studios / London, England / 3 June 2010 / O'Hara

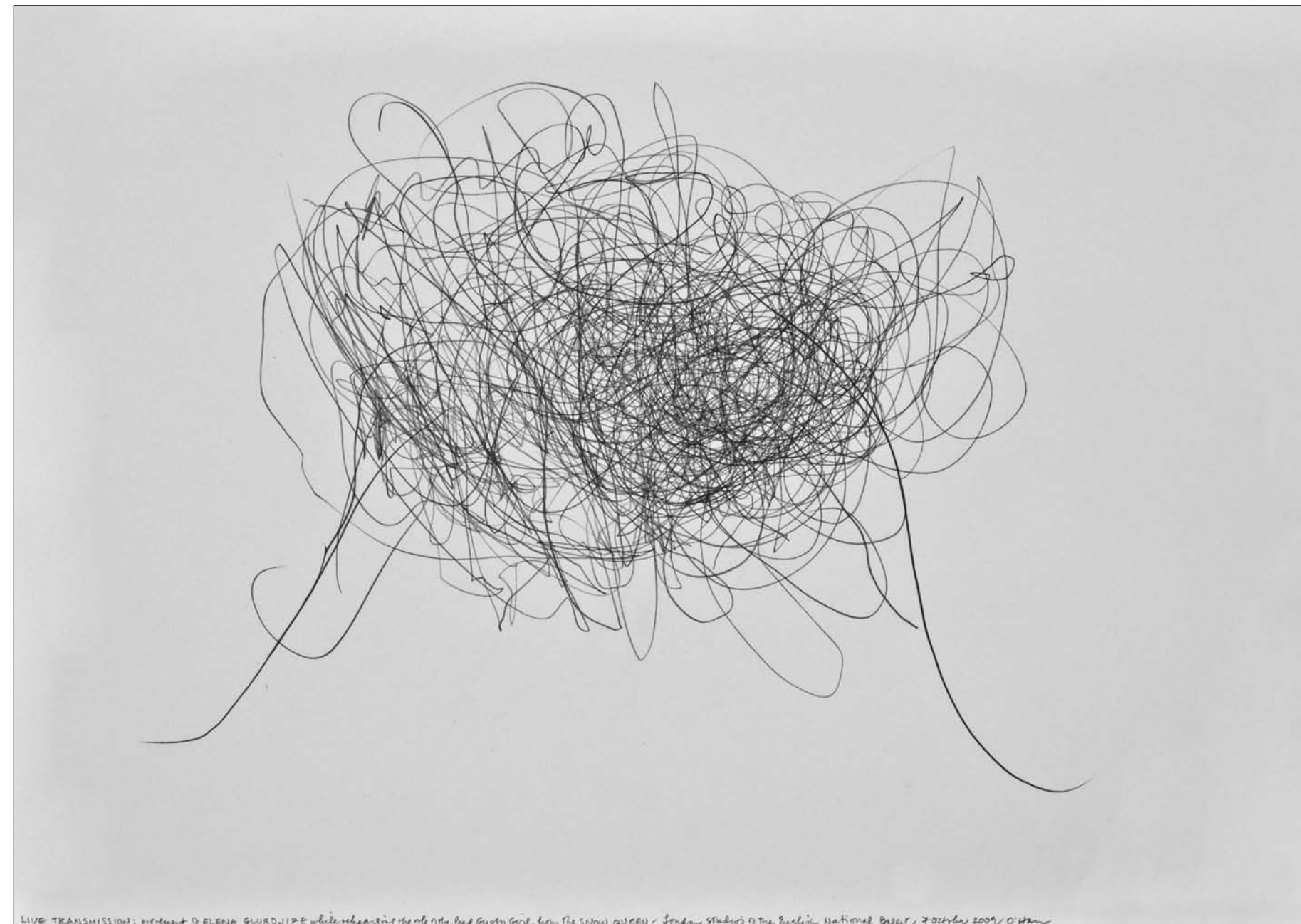
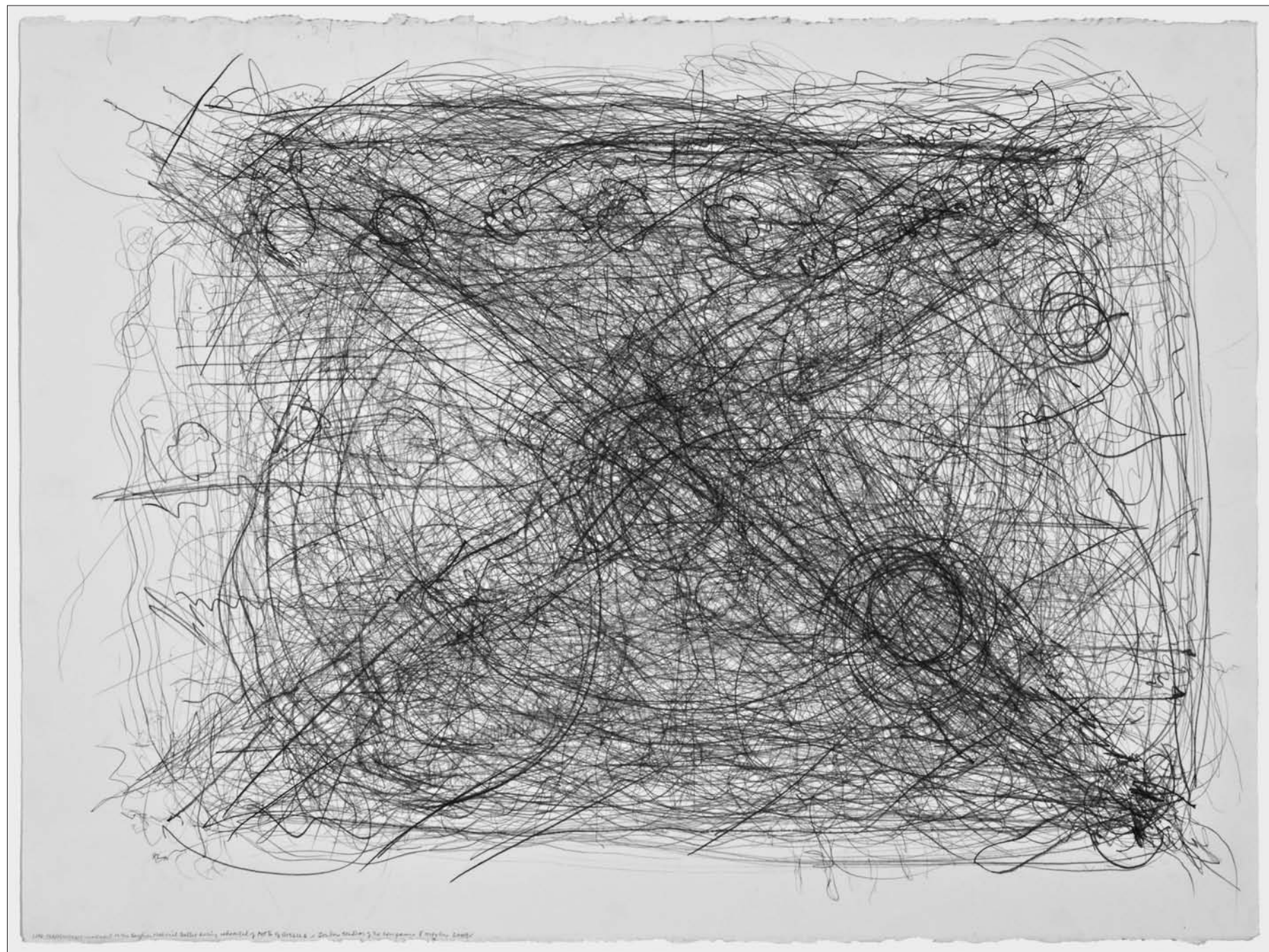


LIVE TRANSMISSION: movement of the hands of IRINA TAKAHASHI as Odile, DIMITRI GRUZDYEV as PRINCE SIEGFRIED and TAMÁS SOLYMOSSI as ROTHBART while rehearsing Act IV of "Swan Lake" / ENGLISH NATIONAL BALLET / Three Mills Studios / London, UK / 3 June 2010 / O'Hara







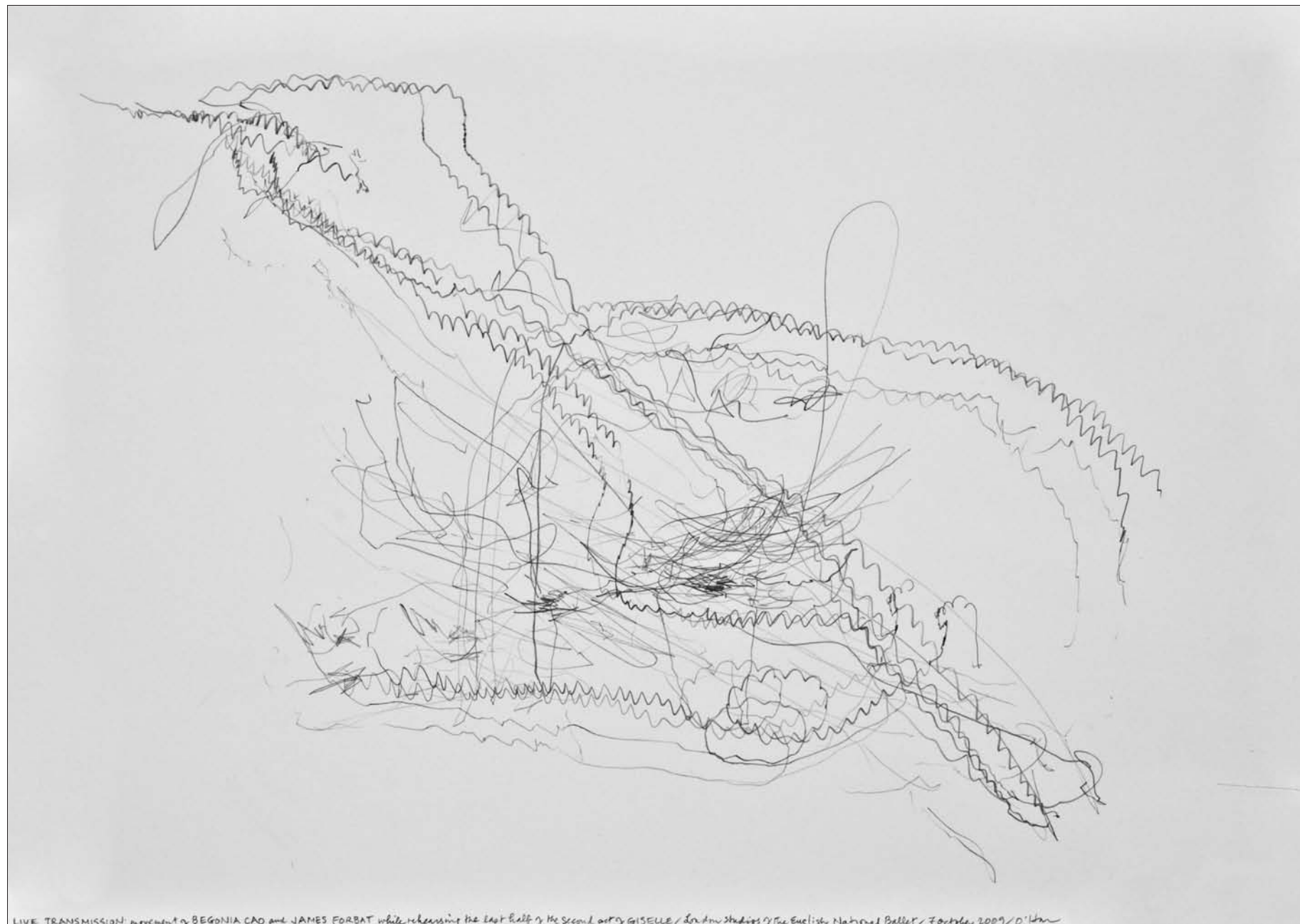


LIVE TRANSMISSION: movement of ELENA GLURDJIDZE while rehearsing the role of the lead gypsy girl in the "Snow Queen" / London Studios of the English National Ballet / 7 October 2009 / 23 x 29"







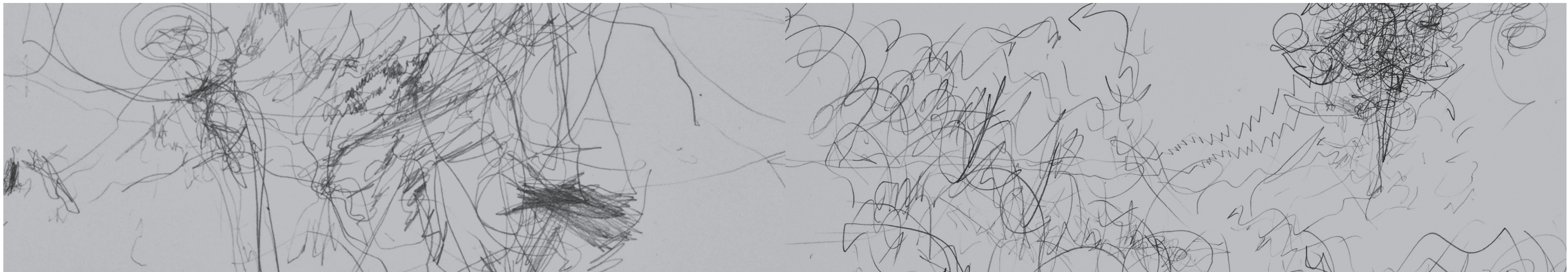


LIVE TRANSMISSION: movement of BEGONIA CAO and JAMES FORBAT while rehearsing the last Ball of the second act of GISELLE / London Studios of the English National Ballet / October 2009 / 0'14m



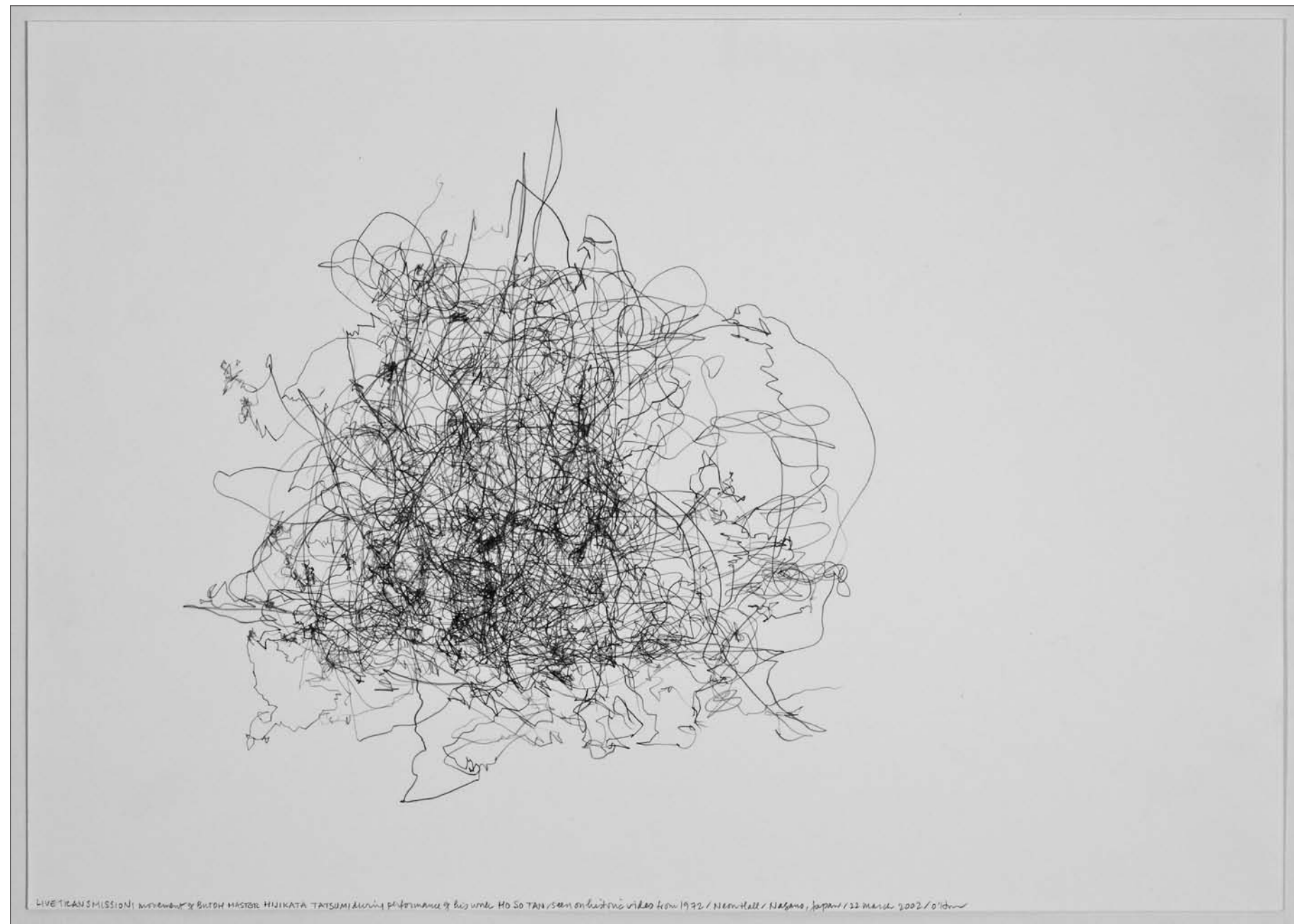
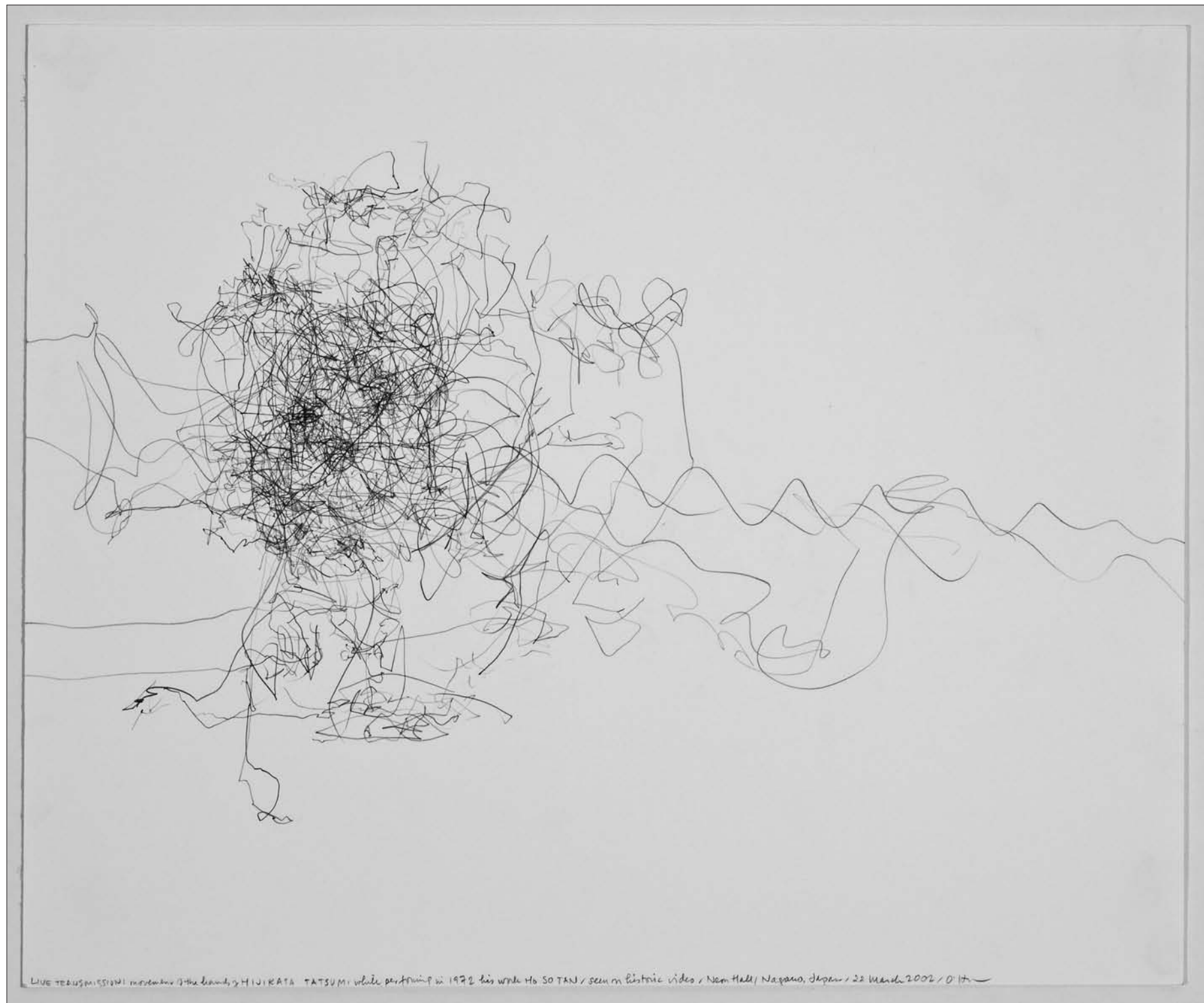
LIVE TRANSMISSION: movement of the hands of BALLET INSTRUCTOR MICHAEL VERNON during Advanced Professi and Ballet Class - STEPS on Broadway / NEW YORK CITY / 17 April 1997





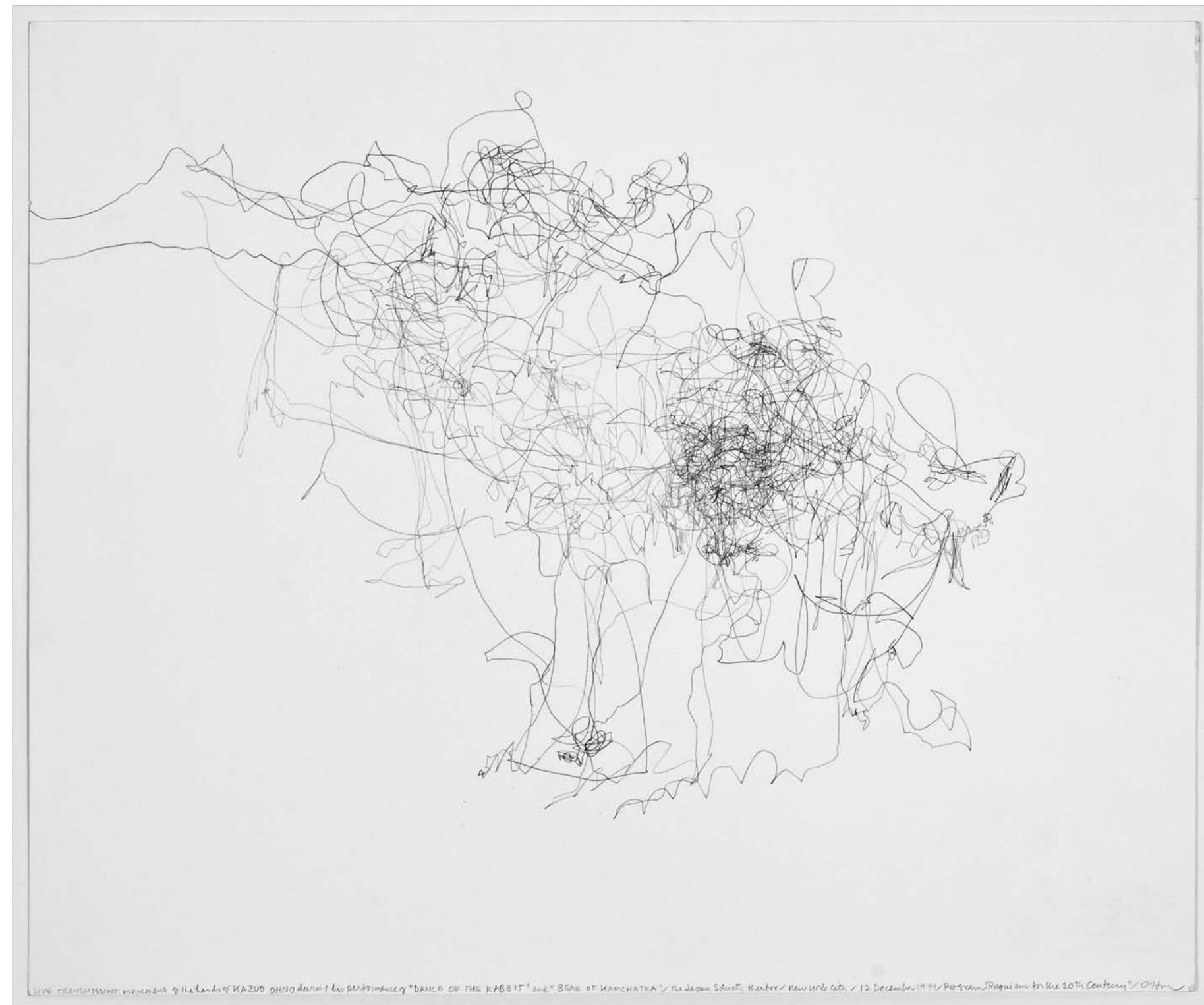
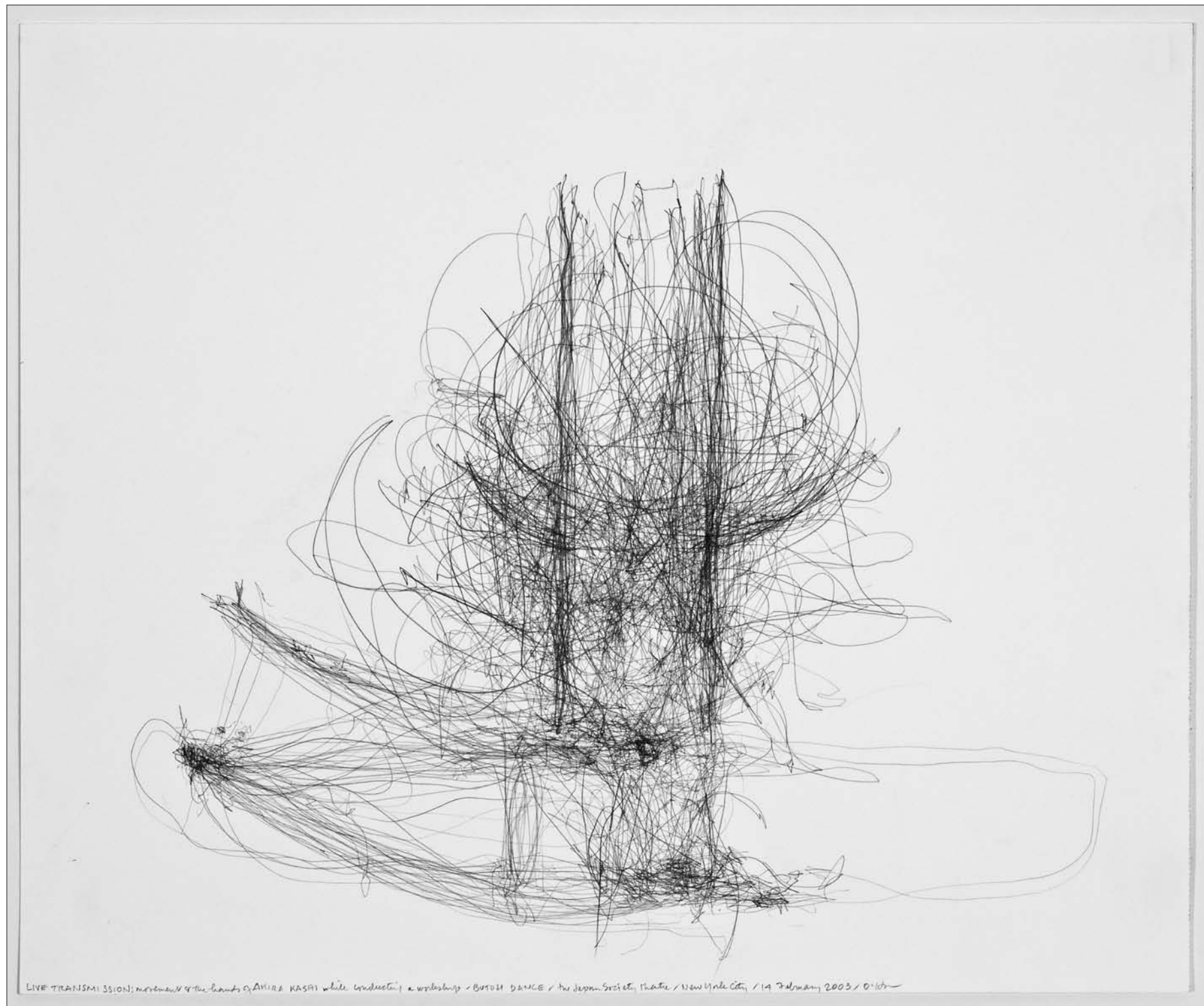
# CONTEMPORARY DANCE



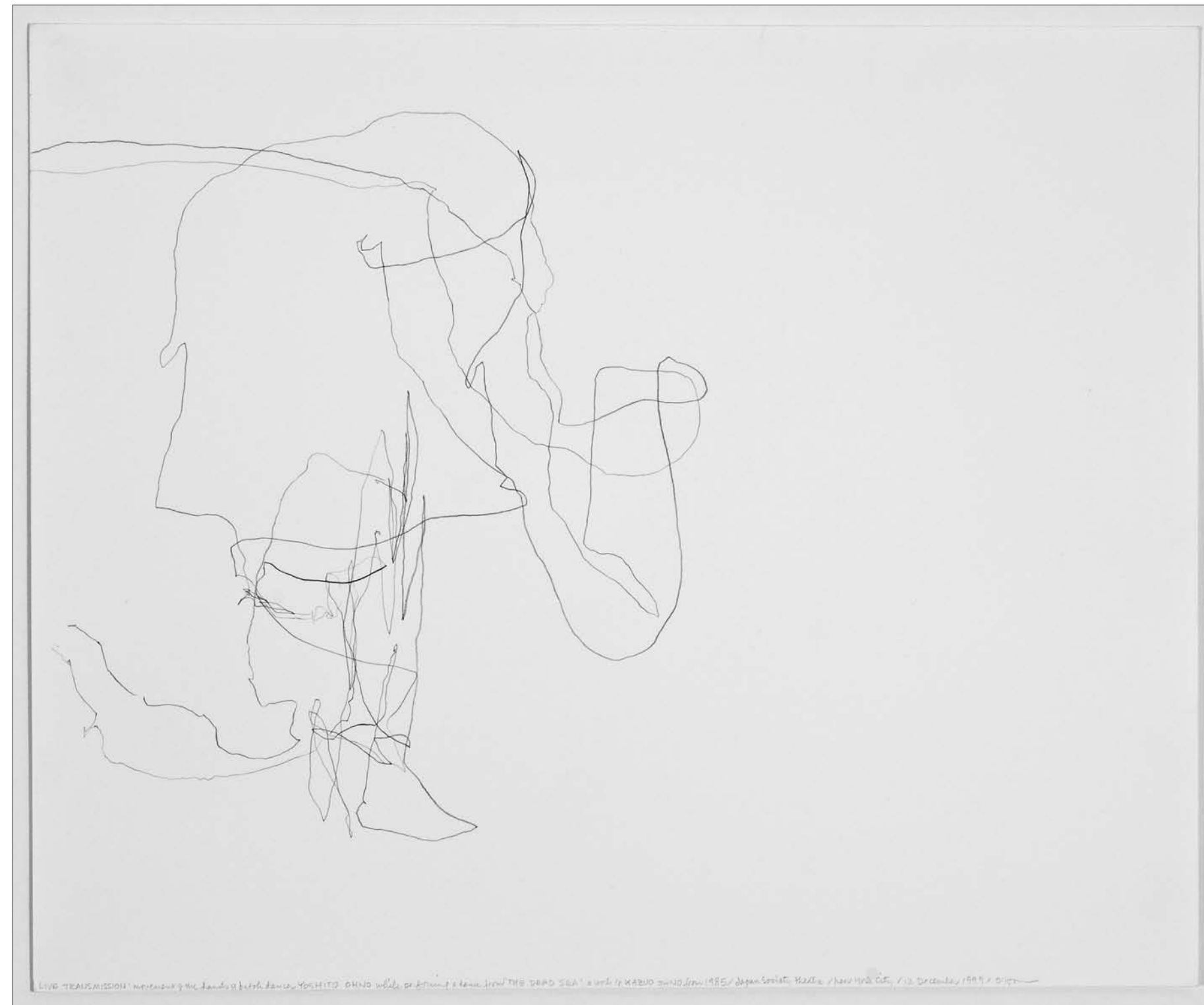
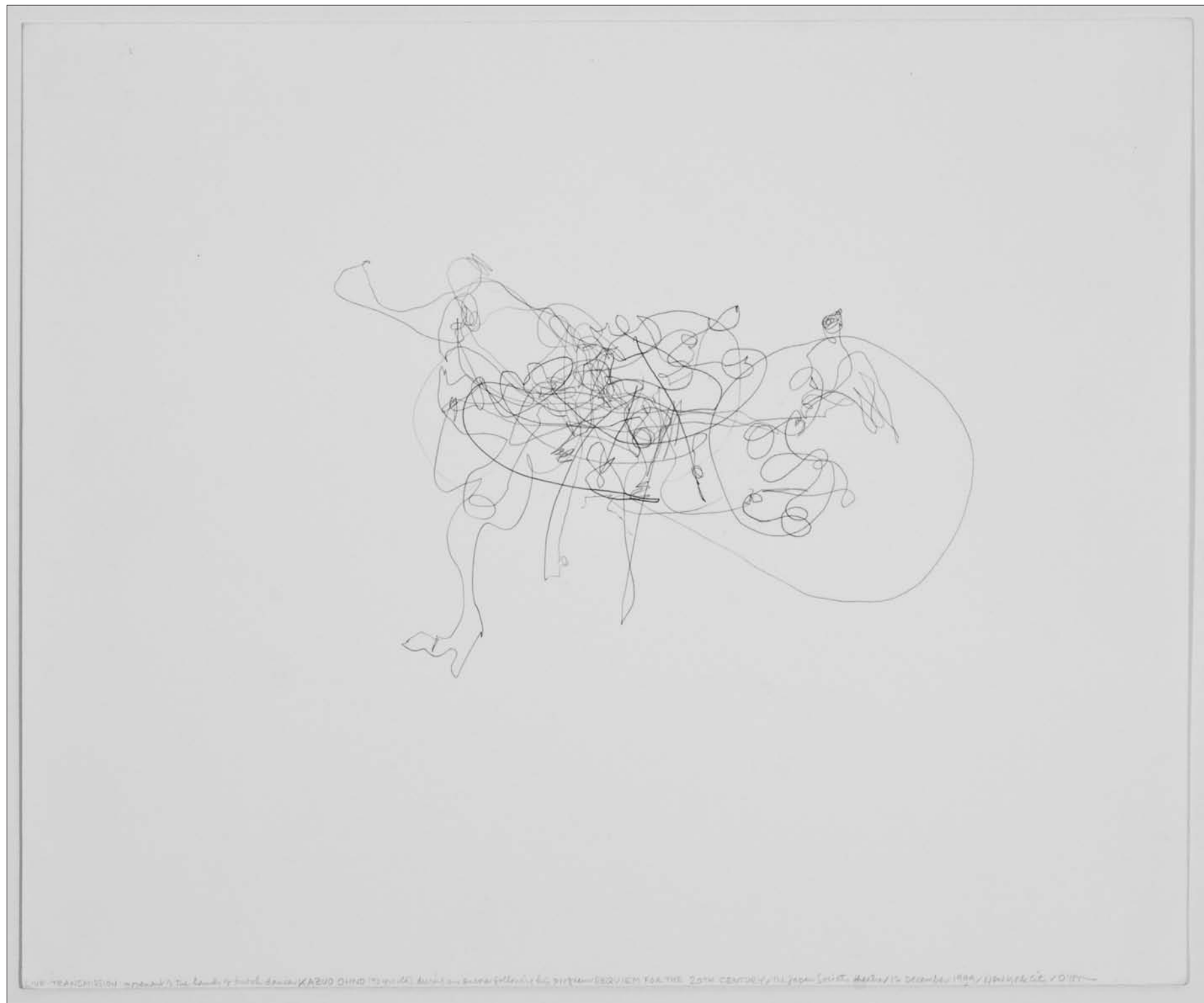


LIVE TRANSMISSION: movement of Butoh Master HIJIKATA TATSUMI during performance of his work HO SO TAN / seen on historic video / Neon Hall / Nagano, Japan / 22 March 2002 / O'Hara

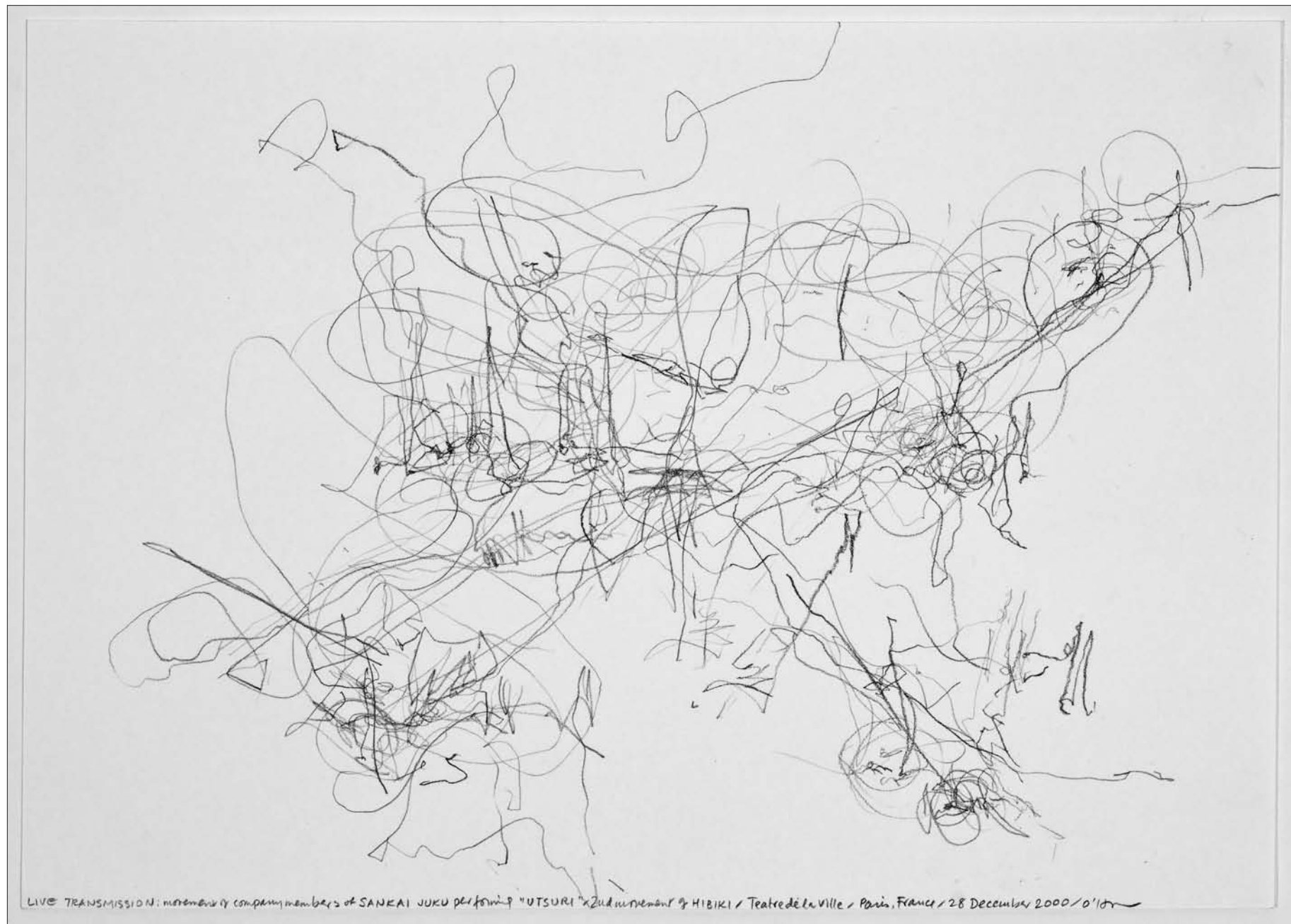












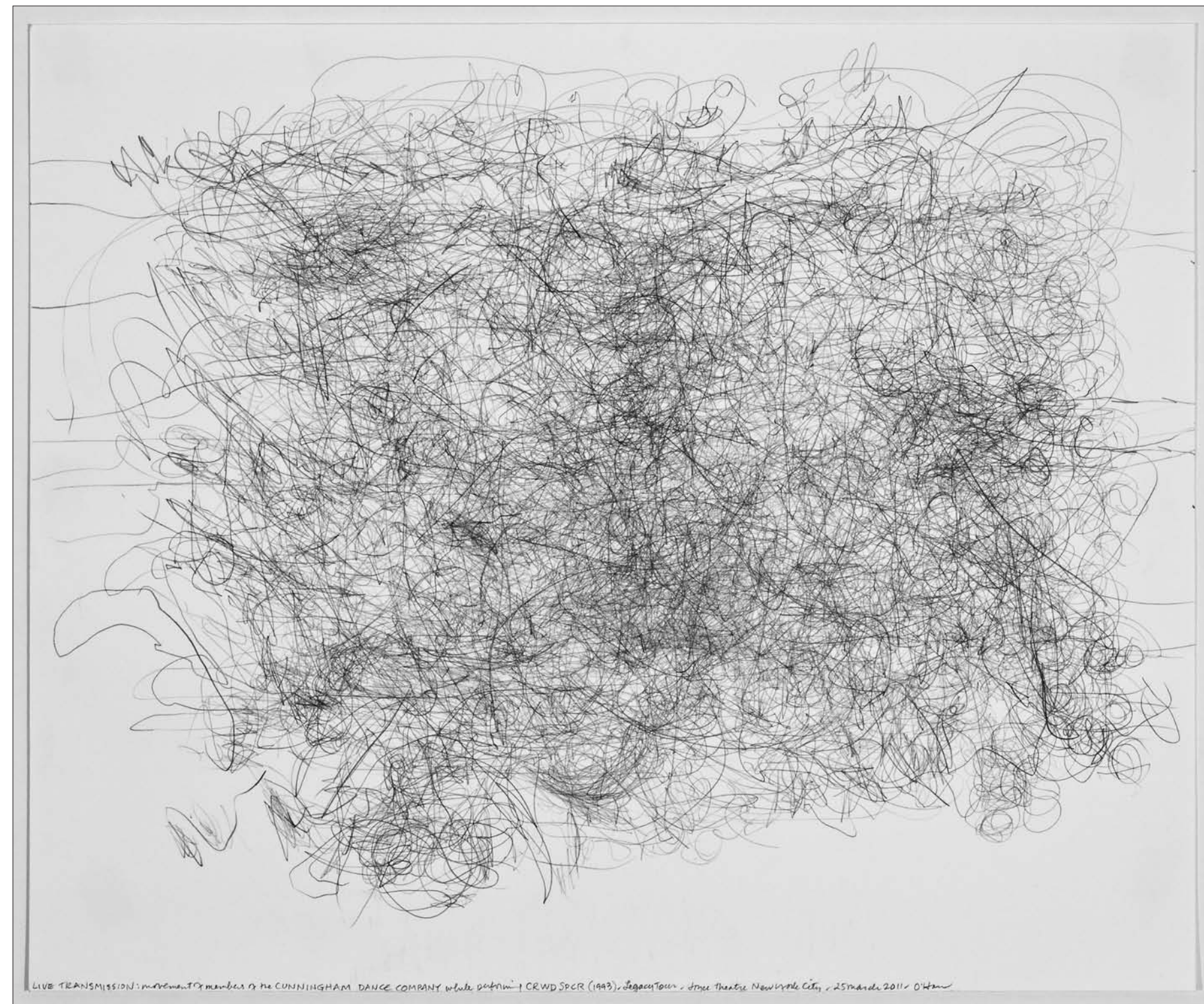






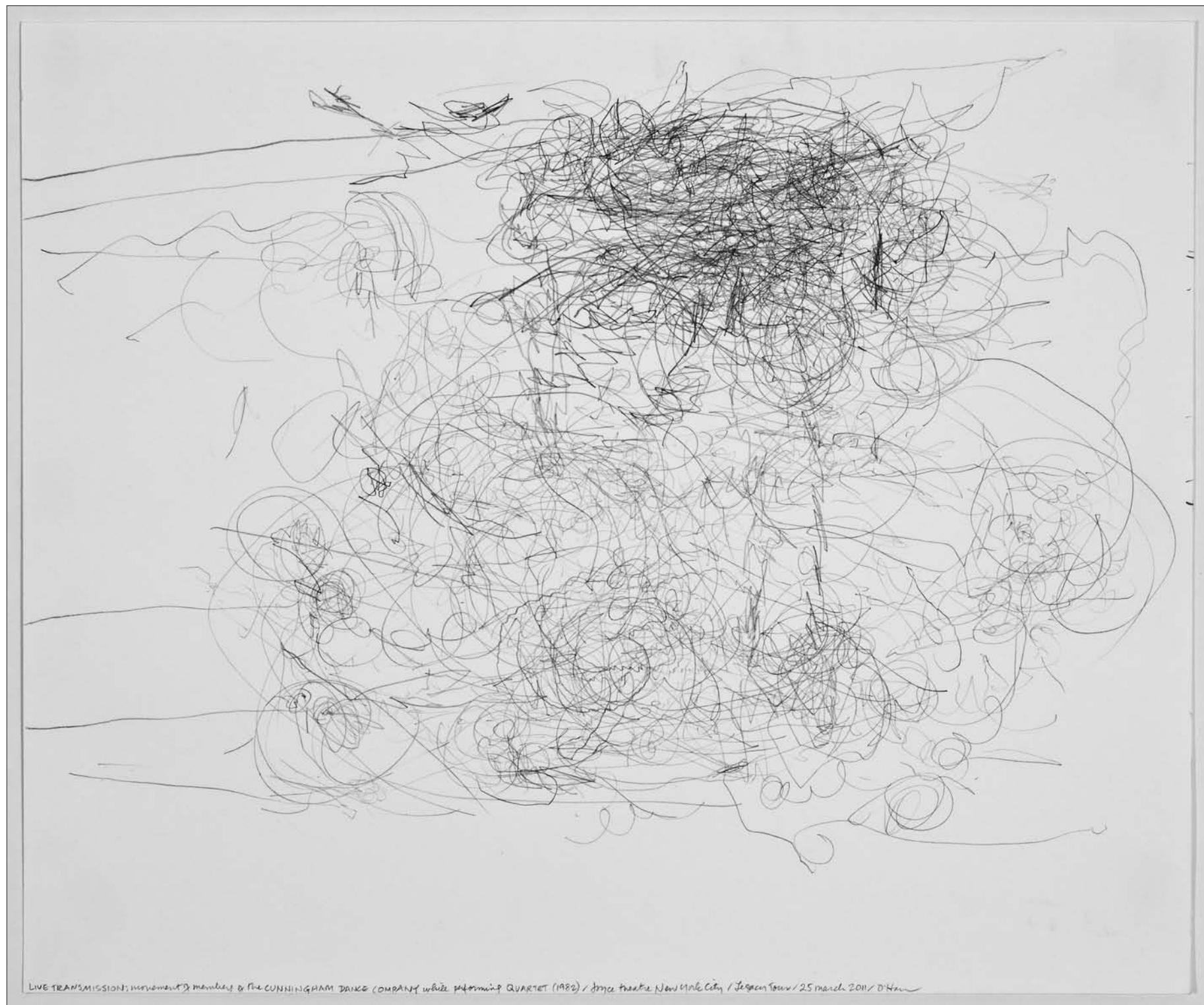


LIVE TRANSMISSION: movement of members of the CUNNINGHAM DANCE COMPANY while performing part 1 of "Nearly Ninety" / Brooklyn Academy of Music / 19 April 2009 / New York / O'Hara

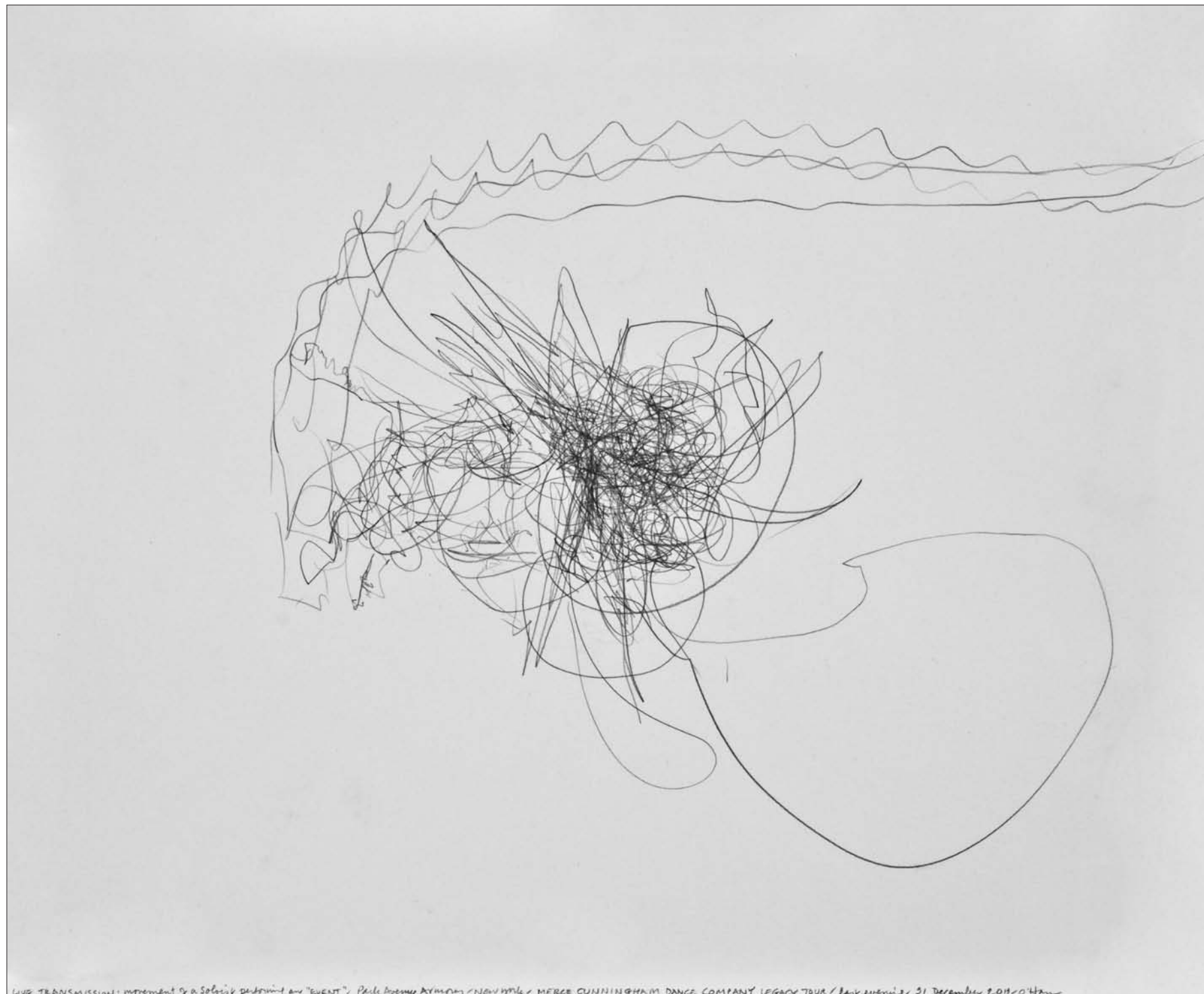


LIVE TRANSMISSION: movement of members of the CUNNINGHAM DANCE COMPANY while performing CRWDSPCR (1993) / Legacy Tour / Joyce Theatre / New York City / 25 March 2011 / O'Hara

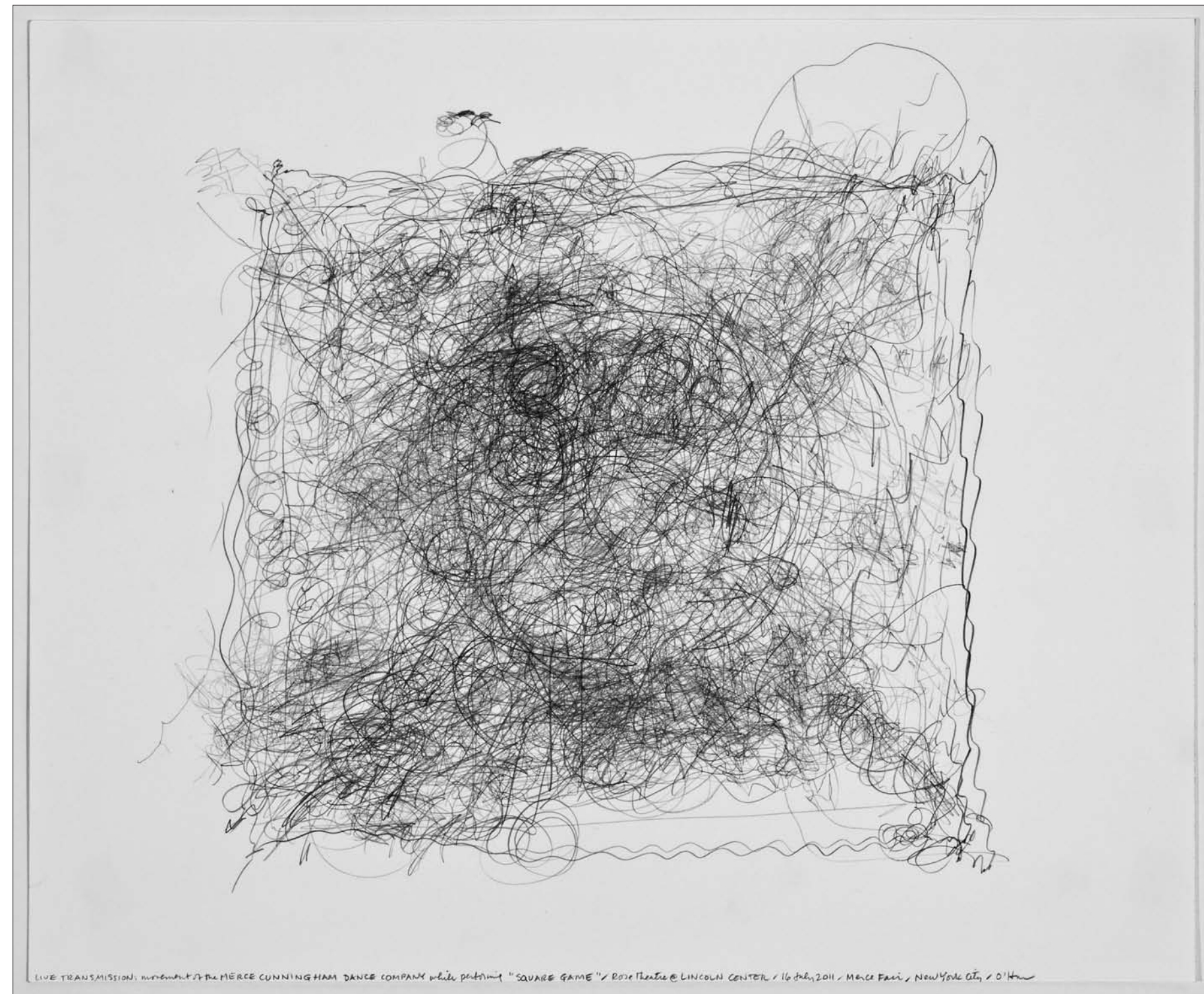








LIVE TRANSMISSION: movement of a soloist performing an "Event" / Park Avenue Armory / New York / MERCE CUNNINGHAM DANCE COMPANY LEGACY TOUR / last evening / 31 December 2011



LIVE TRANSMISSION: movement of the MERCE CUNNINGHAM DANCE COMPANY performing "Square Game" / Rose Theatre @ Lincoln Center / 16 July 2001 / Merce Fair / New York City



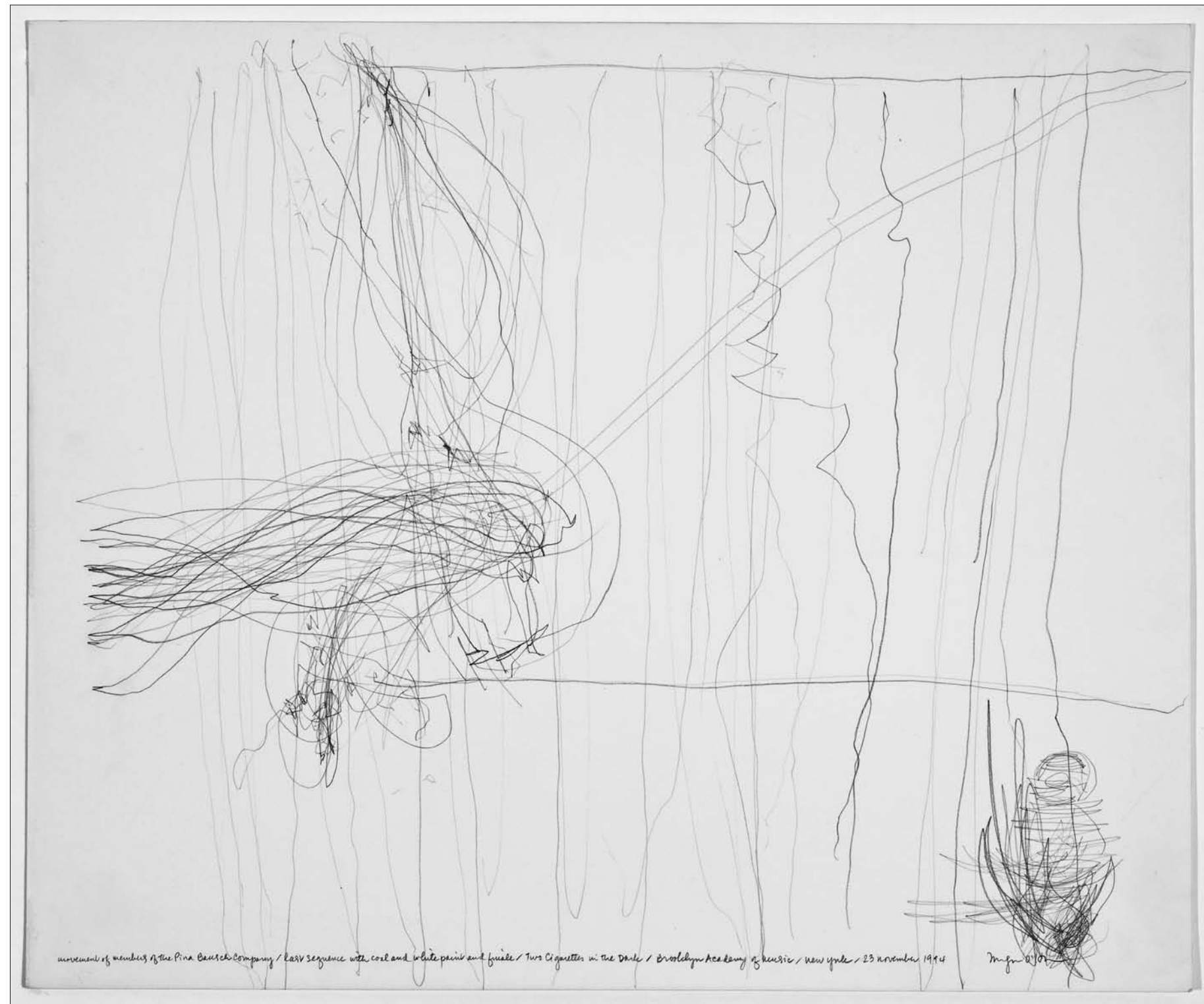


LIVE TRANSMISSION: movement of members of the MERCE CUNNINGHAM DANCE COMPANY performing "Singing Piece" / Legacy Tour / last performance / Park Avenue Armory / New York / 31 December 2011

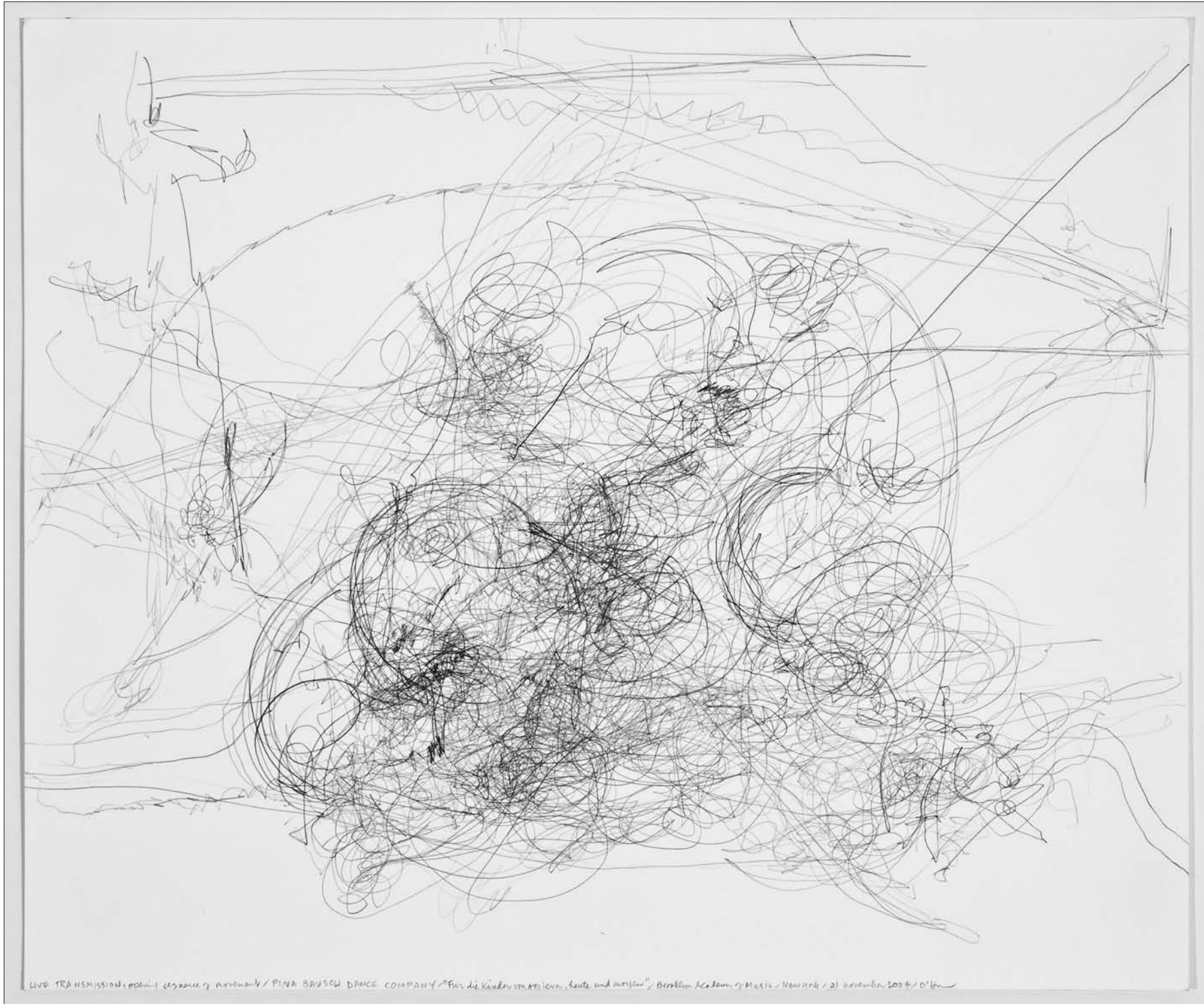


LIVE TRANSMISSION: movement of BILL IRWIN dancing in honor of MERCE CUNNINGHAM / 50th Anniversary of Cunningham Company / Brooklyn Academy of Music / New York / 19 May 1998









# MISSING IMAGE

Bausch

(I found one that could go here)



**MISSING IMAGE**

Bausch  
(I found one that could go here)

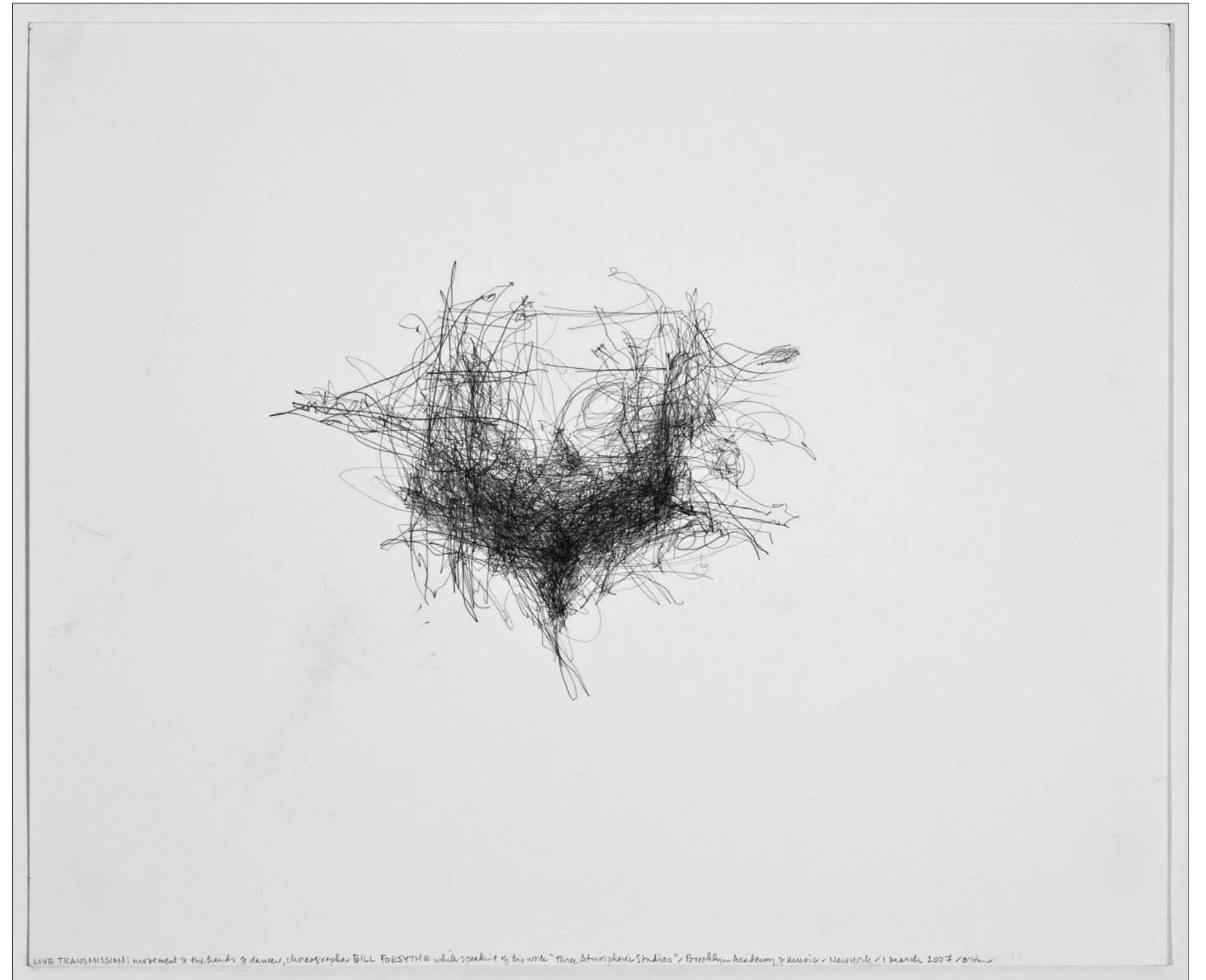
**MISSING IMAGE**

Bausch

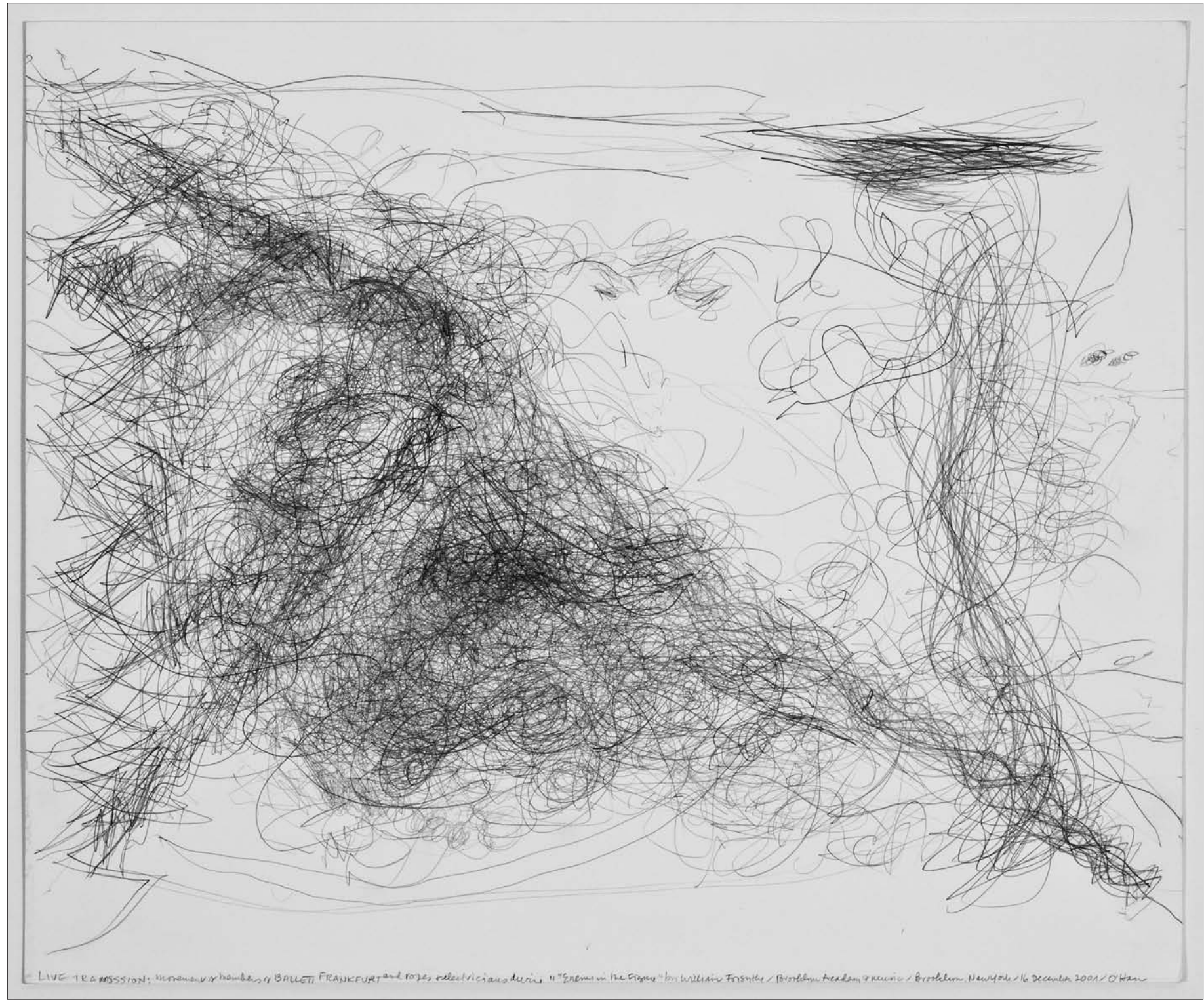
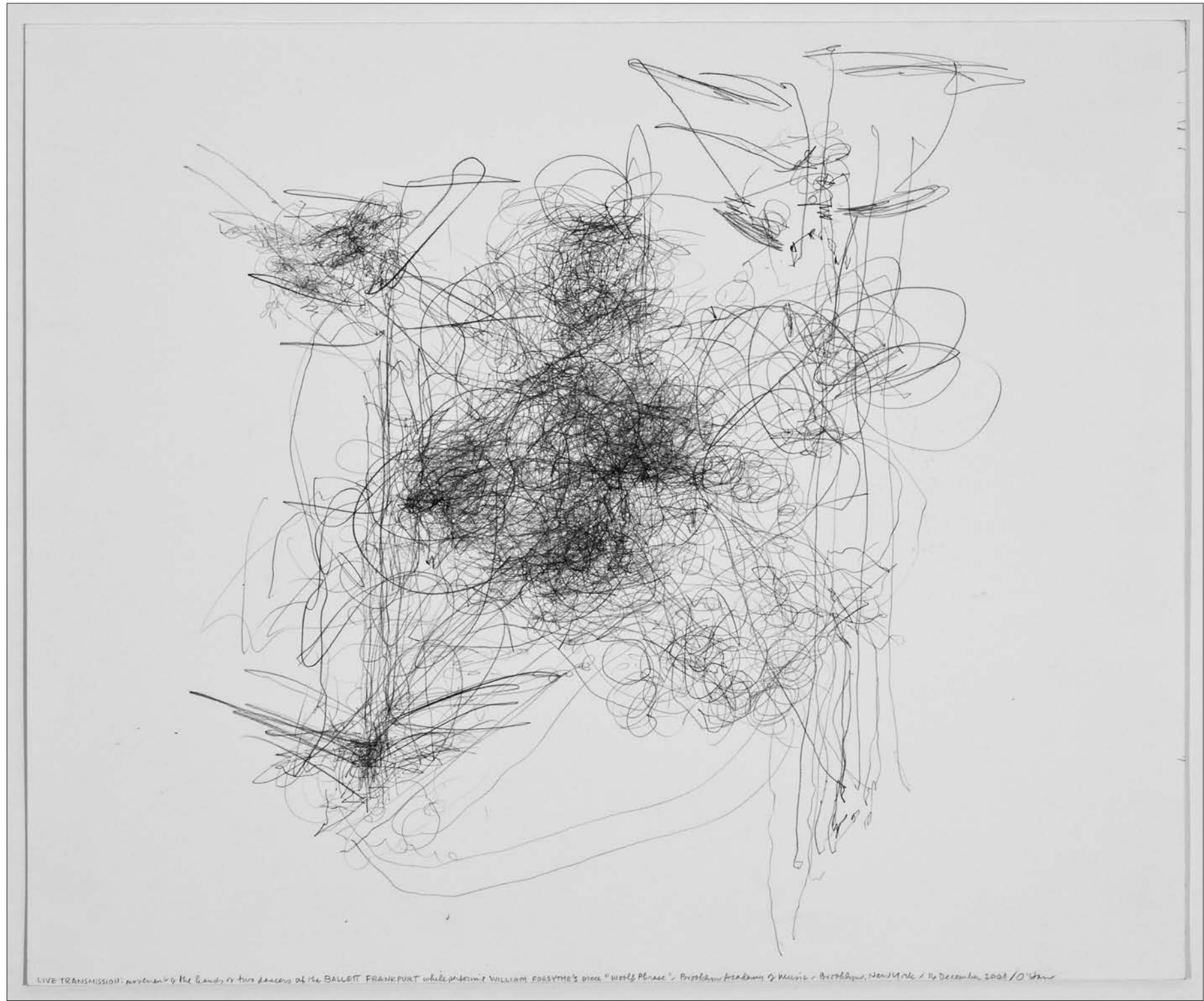


# MISSING IMAGE

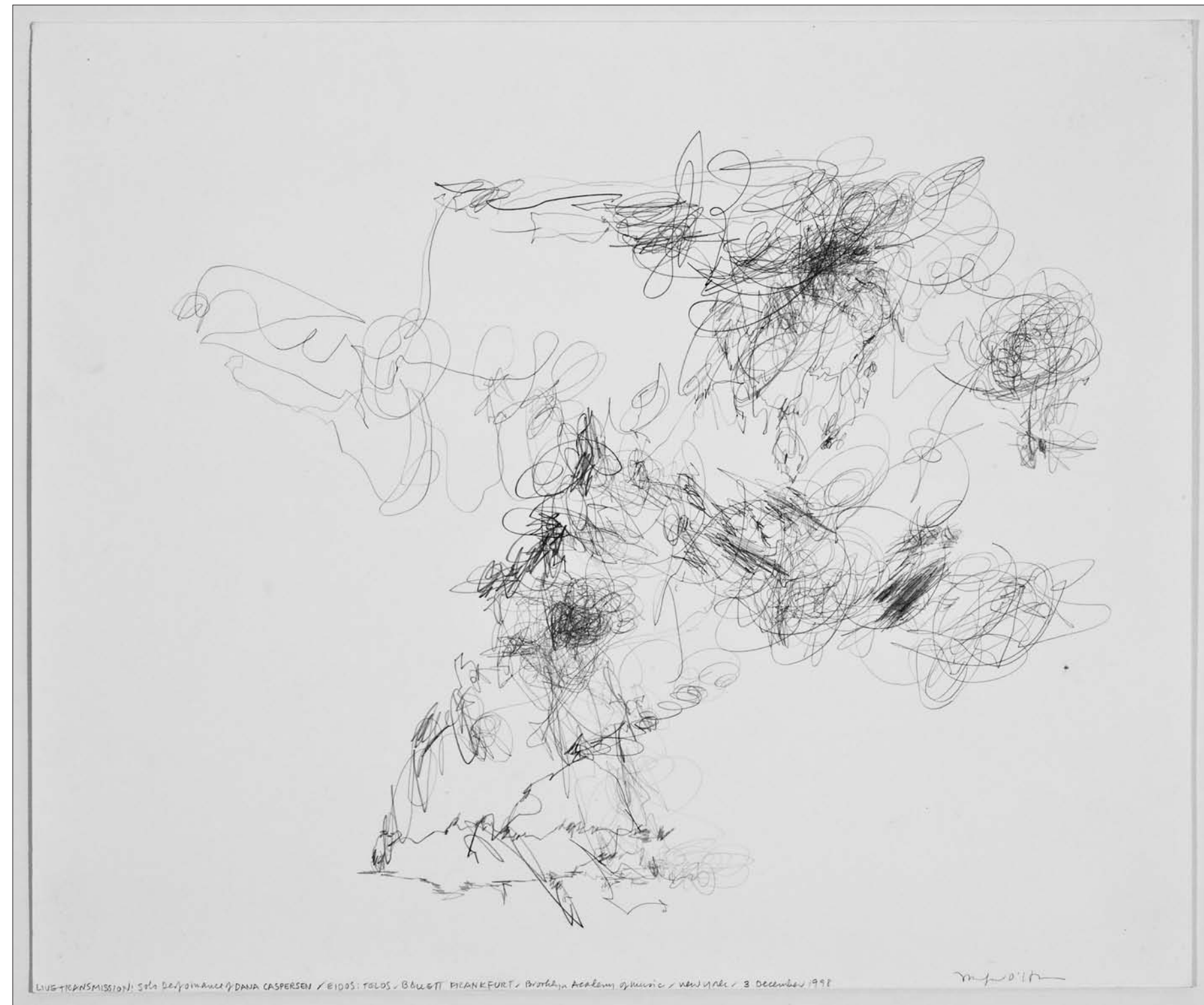
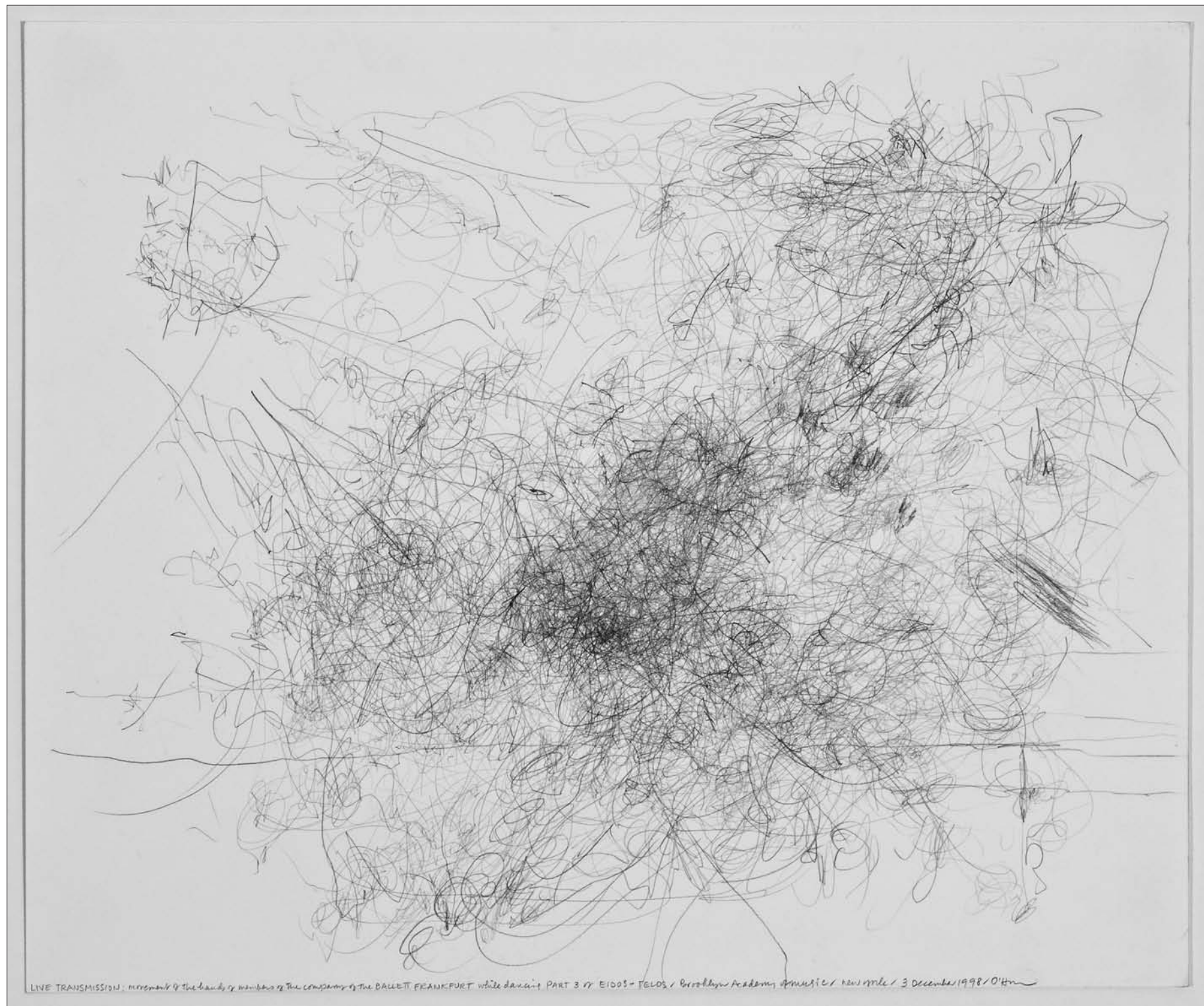
Bausch



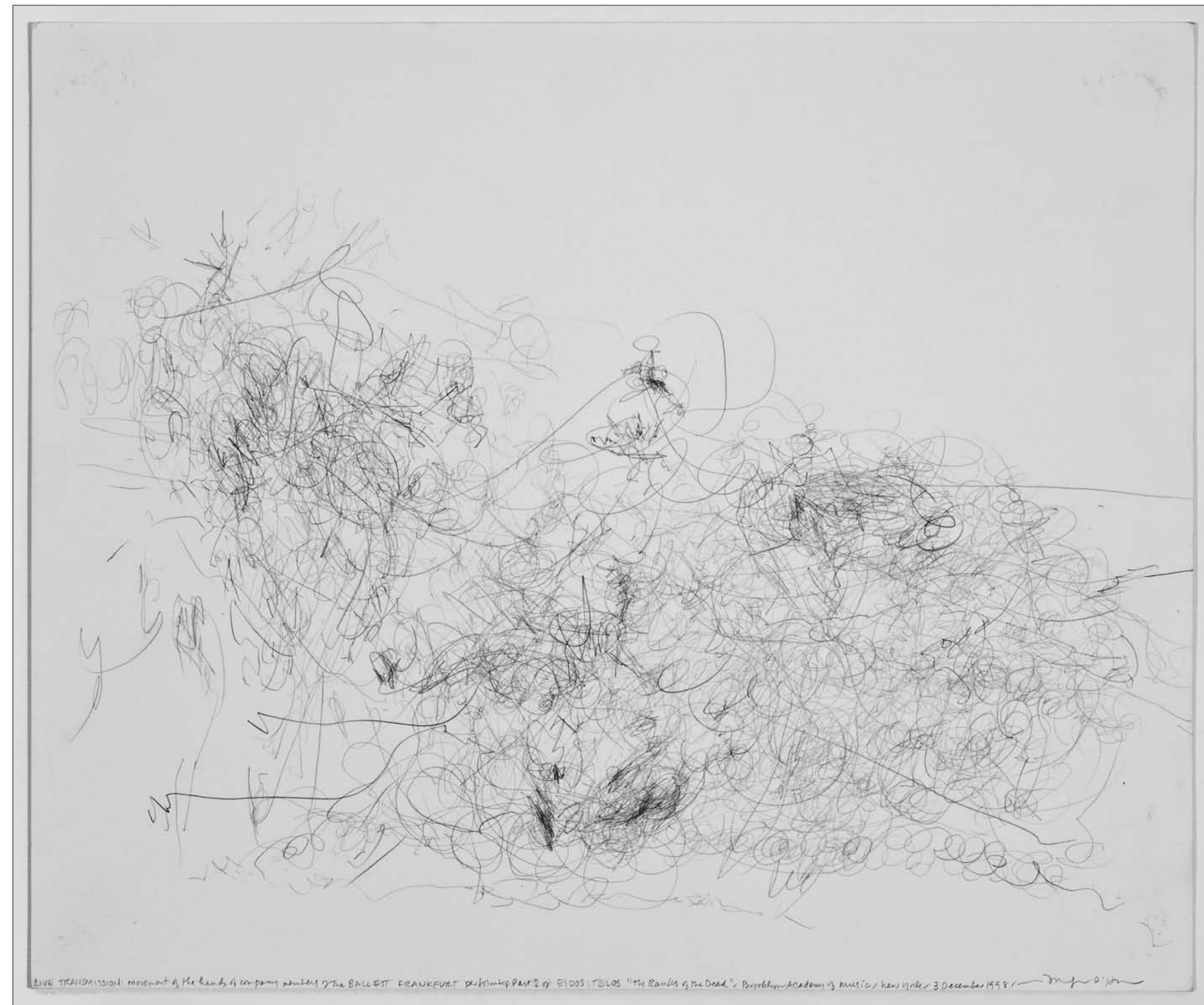
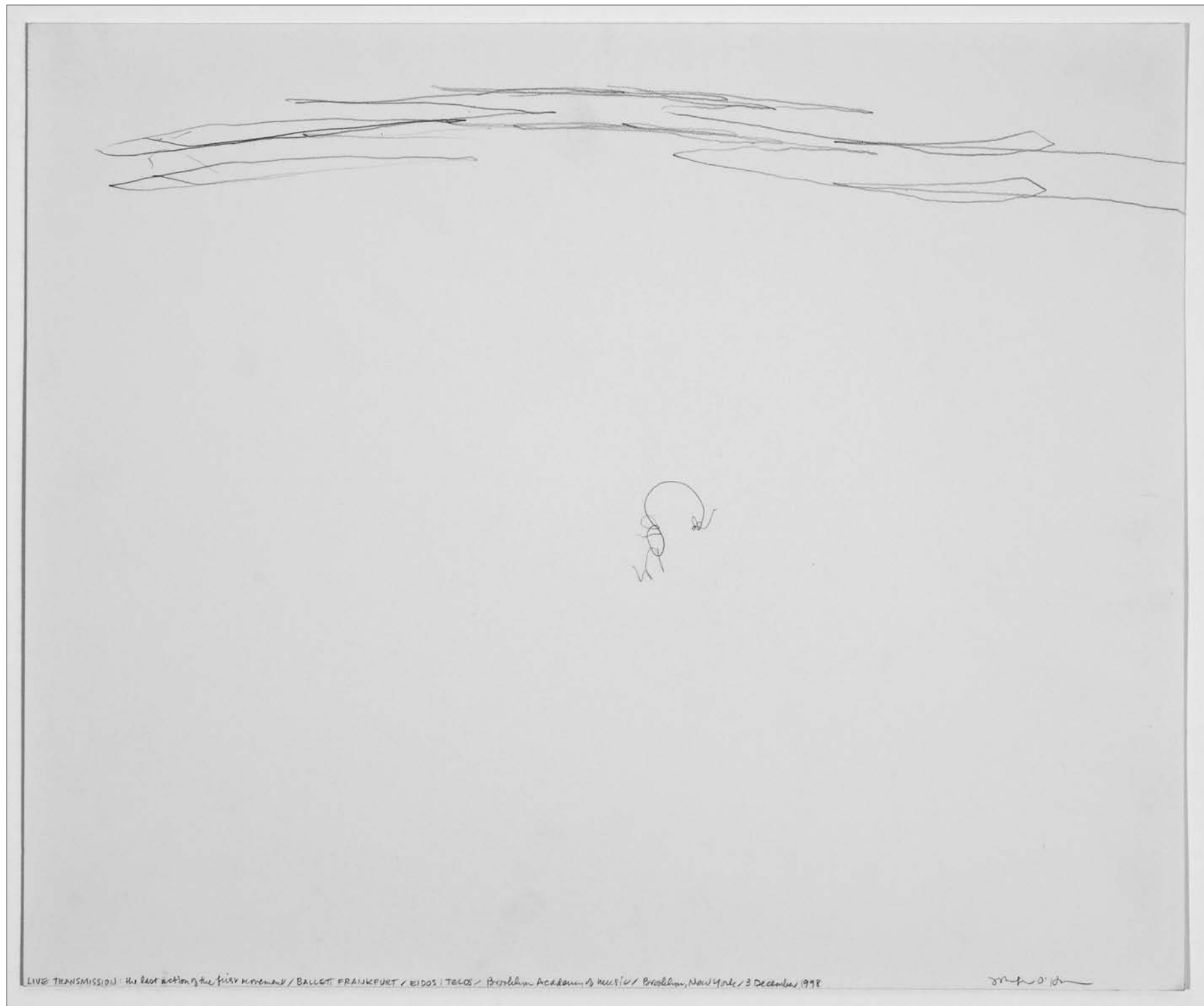




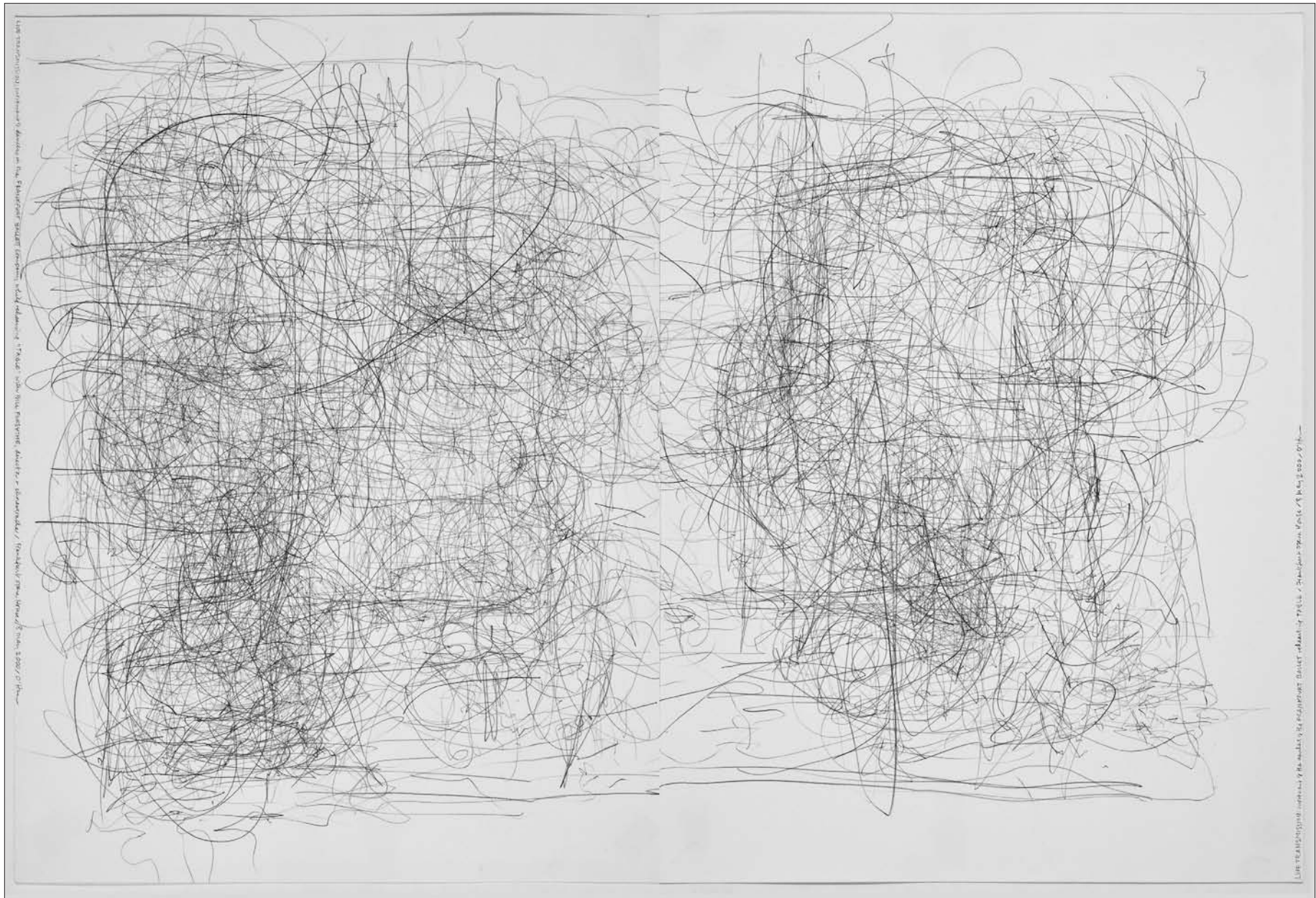




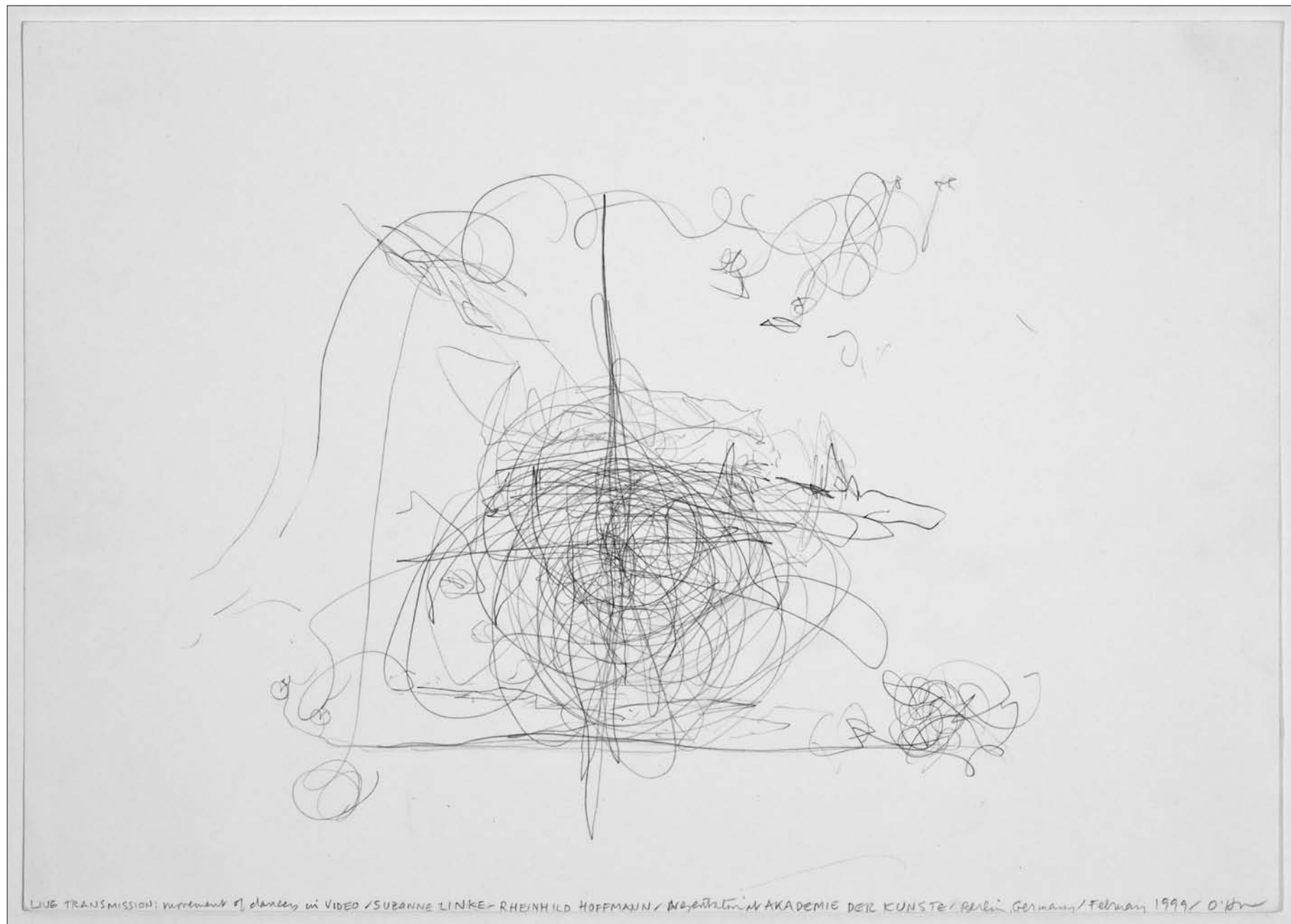










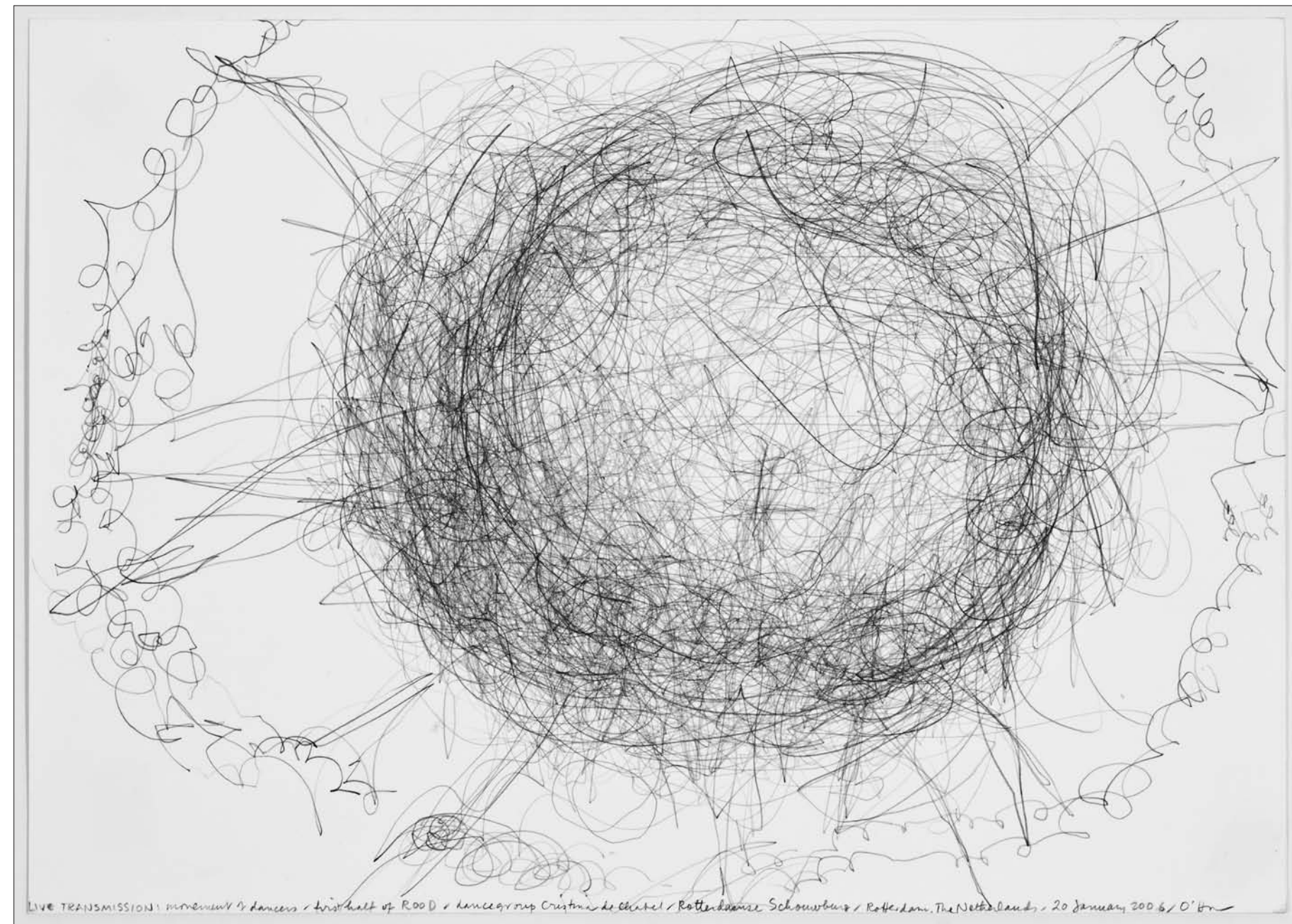
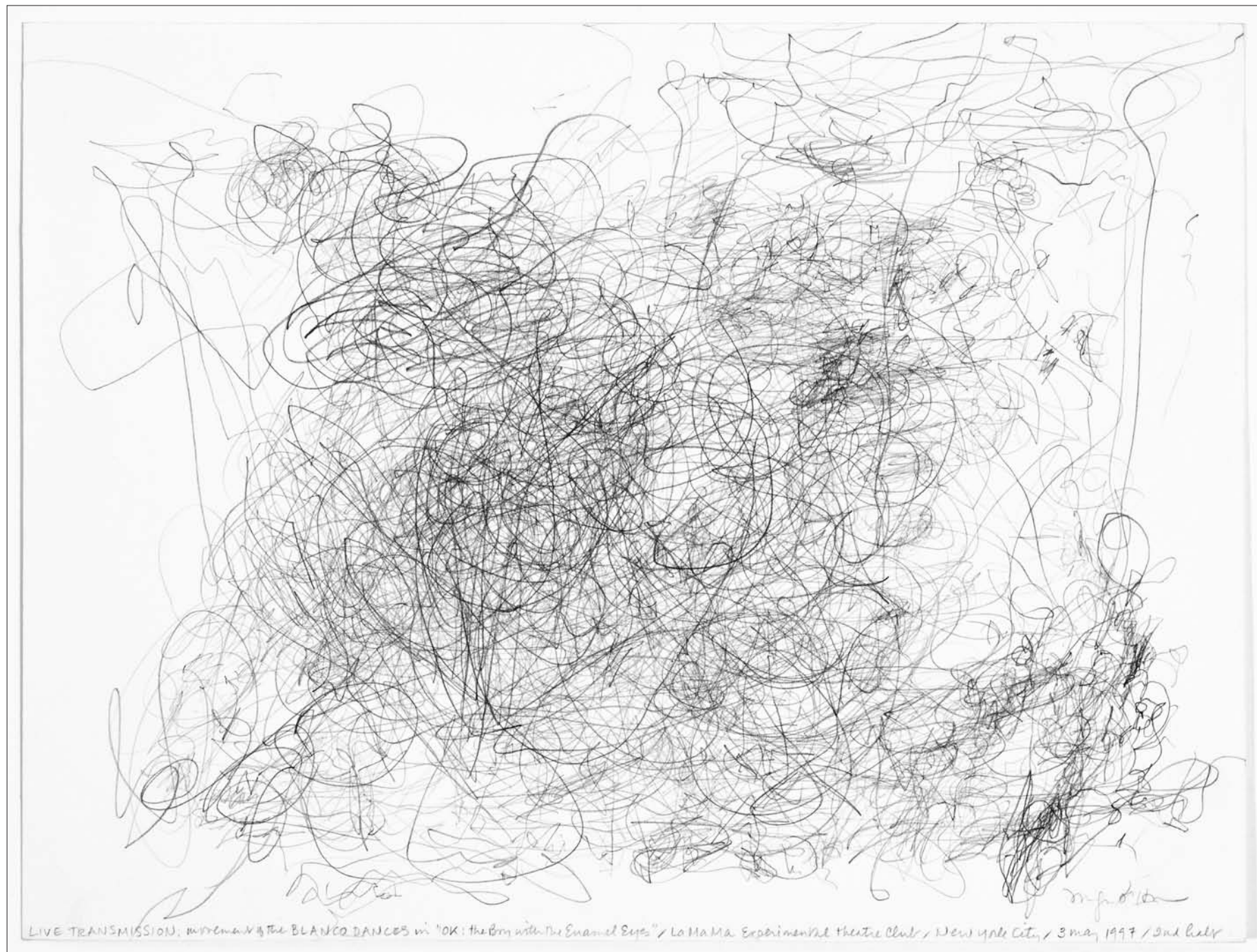


LIVE TRANSMISSION: movement of dancers in video / SUSANNE LINCKE - RHEINHILDE HOFFMANN / presentation at AKADEMIE DER KUNSTE / Berlin, Germany / February 1999 / O'Hara

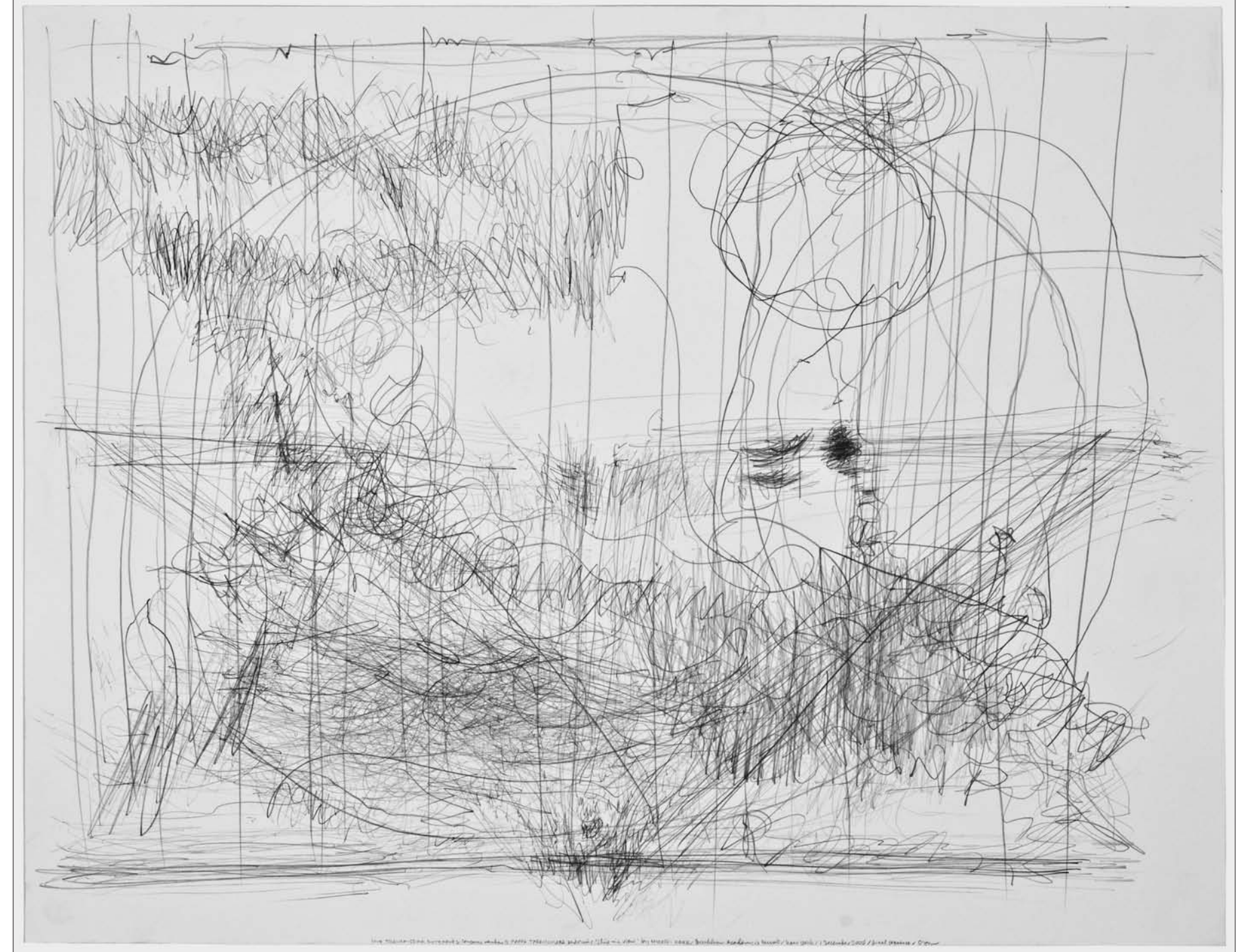


LIVE TRANSMISSION: movement of the feet of ANITA FELDMAN DANCERS / performing the world premiere of "SHOO" / collaborative work of ANITA FELDMAN, LOIS V. VIERK, composer and RHONDA PRICE / The Kitchen / New York City / 19 June 1998 / O'Hara

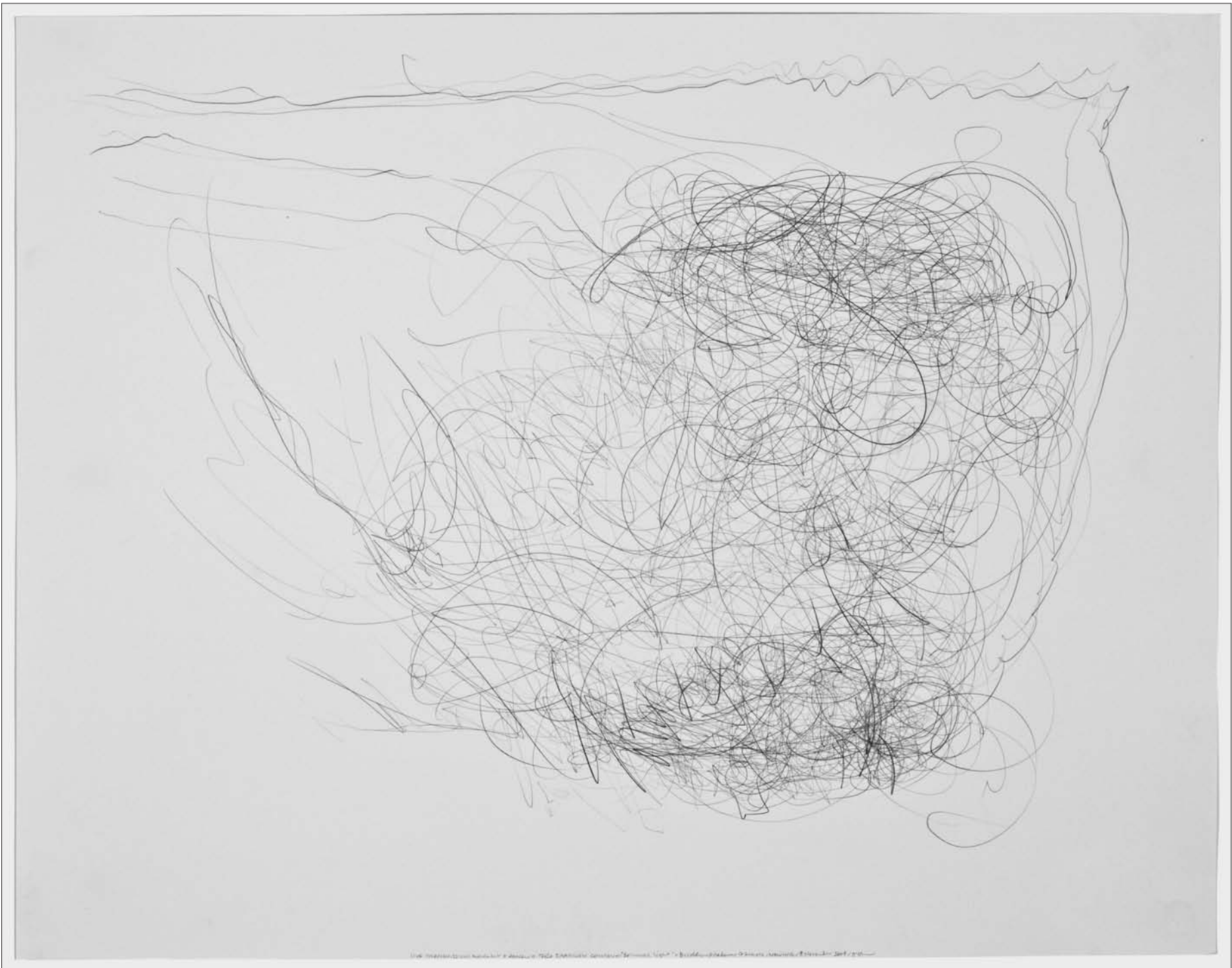








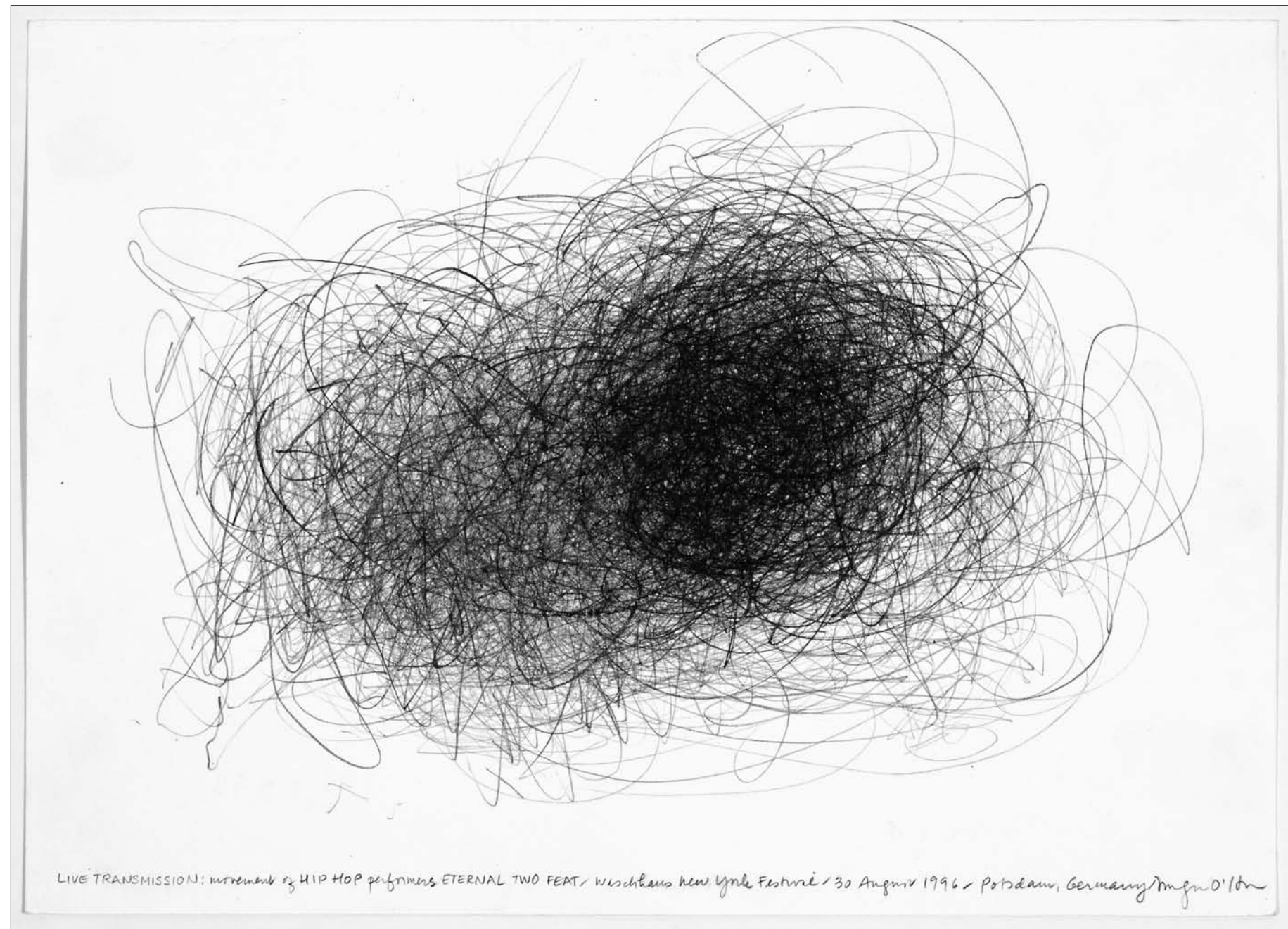
















# GRAPHIC RECORDING. MORGAN O'HARA'S LIVE TRANSMISSIONS BETWEEN ART AND SCIENCE

SUSANNE LEEB

*Line is trajectory, movement, collision, attachment, slicing apart, joining.  
Line is first and last in both painting and in any construction whatsoever.*

Alexander Rodchenko

**NOTE:** This text was originally written for a conference on *Notation and Choreographic Thinking* organized by Gabriele Brandstetter, Franck Hofmann and Kirsten Maar of the Collaborative Research Center *Aesthetic Experience and the Dissolution of Artistic Limits* at the Freie Universität Berlin.

Through her work, artist Morgan O'Hara, born in 1941, draws herself into the context known—in the wake of the modern *episteme*—as the *graphic notation of life*. This subsumes all diagrams and curves that, following the *experimentalization of life* in the mid-19th century, registers predominantly organic movements as signs of life and thus contributes to the elevation of *life as subject* of biological and physiological knowledge. But O'Hara also partakes in an artistic development, in which drawings since the 1960s were given a new role as recorder of motion, or sets of instructions, by the introduction—principally by John Cage—of chance, the focus on everyday life, situationism, and improvisation.

The life sciences of the 19th and early 20th centuries, on the one hand, and the experimentation of drawing, on the other are two specific and contexts in which O'Hara's drawings can be placed. Her work also questions the relationship between art and science. Cage was an important artistic reference for O'Hara, but she also shares with the sciences a fundamental interest in the graphic visualization of the phenomena of life. In this article, I address the significance of the term graphic notation of life with reference to Morgan O'Hara's drawings by highlighting the history of this enterprise as well as the specific artistic approach O'Hara is developing within the larger field of social practices.

## THE MOVEMENT OF RECORDING

In the wake of process art, as identified by several exhibitions at the end of the 1960s which included artists Robert Morris, Barry Le Va, Richard Serra, and Eva Hesse among others, sculpture was not the only art form defined as the result of process. Drawing took on the role of either registering and documenting movement itself or prescribing a subsequent action as in a score. At first glance, the use of drawing which concentrates on process and movement seems hardly worth mentioning, as Pamela Lee writes on process art: “[N]othing could seem more obvious than the way in which drawing registers the process of the artist's making [...]” It has long been a prime objective of drawing to capture physical objects and was, therefore, precisely the opposite of processuality, “[g]raphic contour, modeling, chiaroscuro—all variants of drawing techniques—work against the model of process in consolidating form.” Beyond options of tautological versus equivocal, Lee seeks the specific meaning of drawing in the light of sculptural works of process art. On the one hand, they assume, beyond the status of sketches, the role of instructions or the score of a movement to be carried out—e.g., when Sol LeWitt with his Proposal for Wall Drawing (1970) gives instructions for how a certain drawing should be executed on a wall. On the other hand, Lee's proposition is that drawings, precisely due to the heavily material-oriented quality of the works of process art, serve to re-visualize an often overlooked temporality and indeed distinguish contemporary drawing as the “result of a process-based activity.” (Butler)

Temporalization was accompanied by further innovation, contributing to a shift in the role of drawing: the studio was abandoned as a workplace, one's own body was actively integrated in art production. In dance and performance—one need only to think of Yvonne Rainer or Trisha Brown—non-narrative forms of movement were tested and, not least, working and



drawing processes were mechanized and thus desubjectified. Artists experimenting with drawing in the 1970s were concerned with creating a new relationship between the process of drawing, its material preconditions and its result. This applies to the picture medium, for example when Sol LeWitt draws on the wall; to the attitude of the artist, when Robert Morris closes his eyes while drawing; and finally to the underlying physical process, when William Anastasi presses a pen on a piece of paper on the subway and records the trains' vibrations for his *Subway Drawings*. The fact that the *Subway Drawings* were made en route to a game of chess with John Cage hints of the degree to which Anastasi's method is indebted to Cage.

Morgan O'Hara, whose initial contact with John Cage was in 1961, has built a large part of her practice on recording movement: in music, dance and everyday gestures. With her original practice, she has also developed a new form of drawing, which includes not only anti-formal formal solutions, undermining the common dichotomy of abstraction / figuration and initiating a post-studio practice, but also the establishment of non-narrative forms, the inclusion of her own corporeality as a medium with simultaneous desubjectification, as well as processuality. In the following article, I focus on her drawings, since they both exemplify and raise questions regarding the notation of motion. Her work is contextualized in both the temporalization of art in the wake of process art and in the historically broader liberation of line propagated by the avant-garde. Also applicable is the question of graphic notation in the life sciences which visualize the *phenomena of life* (Marey). In O'Hara's work one can discern a *kinetography* with which—in an *episteme* that recognizes the functions of life in movement, forces and impulses—shifts notation from discreet signs to lines and curves. O'Hara's drawings expand this method of graphic notation through performative elements and can therefore be understood as *kinetography*.

*Kinetography is not just the notation of movement [...]. It also implies, in the widest sense, the performative effects that turn the description of movement into a movement of description. This not only implies a constitutive mobility of writing as a medium of spatially and temporally stretched communication [...], but also the activation of an inherent kinetic potential of writing systems. Arns / Goller et al.*

O'Hara's drawings do not specifically address the kinetic potential of writing systems, but they certainly deal with the kinetic potential of mark making as a transmission process *prior* to the distinction between drawing and writing, in other words, *the movement of recording itself*. She *performs* the act of drawing.

This is particularly true of a series of drawings that O'Hara began thirty years ago and calls *Live Transmissions*, now comprising more than 3,000 works. The *Live Transmission* drawings are performed in the sense of a 'live broadcast' and are created within clearly defined parameters. O'Hara observes temporally determined movement sequences and records what she sees as direction vectors and impulses with one or two pencils, as simultaneously as possible, with both hands, onto paper. She *"transmits the direction of a gesture as well as the quality of energy of a given movement as line"*, as stated in a project definition. The pencils have different

grades of hardness. The speed and intensity of the drawing are adapted to the observed movement. Her eyes do not control what is drawn but are directed almost exclusively towards that which moves and which she is transmitting. The process lasts as long as she can observe the action and remain attentive or until the action observed is completed. O'Hara's activity is a registering transmission. The date and the name of the person(s) executing the movement are part of each sheet, written precisely across the bottom edge of each page.

In New York she initially recorded classical and free jazz concerts, often at the Knitting Factory, as well as dance performances by the Merce Cunningham Dance Company, Pina Bausch, the Forsythe Company, to name a few, and her practice included observing and drawing people at work and performing everyday actions: a sous-chef peeling cucumbers, a tea ceremony, farmers planting rice, midwives assisting at birth, doctors interviewing patients in a psychiatric ward. Her lines are exemplary of movement writing, in that

*"...its modes (speeds, directions) and forms of materialization (liquids, strengths) and the effects of its perception and perceptibility (sharpening and fading of the senses) are to be taken into account." Arns / Goller et al.*

This specific form of recording is situated in the arts which push the limits of notation, when, following Cage, chance, everyday life, improvisation, and experimentation began playing an essential role. Conversely, however, the question of notation in the fine arts comes at a point in time when drawings become process-oriented, temporal events. O'Hara responds to this with her own form of notation that in face of the anti-representational character of these arts—new music or modern dance—consists in the transmission of direction vectors, impulses and intensities. The method of recording and the choice of subject is peculiarly apt, for example, when O'Hara transmits the performance of a piece by sound composer Alvin Lucier played by the S.E.M. Ensemble. In further pursuing Cage's identification of the sonority of silence, Lucier experimented in various ways with frequencies, vibrations, waves, resonances, or feedback. For *Music for Solo Performer* (1965), a piece created with the assistance of Cage, he acoustically amplified alpha brain waves by attaching sensors to his brain to make various percussion instruments resound via loudspeaker membranes.

Correspondingly, O'Hara has had her drawings used as scores for musical interpretation which are interpreted by a musician and simultaneously transmitted through a new drawing. British singer Sarah Frances improvised from a *Live Transmission* drawing which O'Hara had produced from contractions of a human heart seen via magnetic resonance imaging. In another instance, Anthony Braxton performed 15 of O'Hara's *Live Transmission* drawings by associating quality of line with color tones and intensities which he produced through his saxophones, again, while O'Hara drew the movement of the new sound transmission.

By contrast with other transmissions from one medium to another, the essential features of the work in this case consist of losses and gains in the medium of drawing which Giorgio Agamben in *Notes on Gesture* calls *"pure*

*mediality."* *"The gesture is the exhibition of mediality:... the process of making a means visible."* (Agamben) However, such mediality had to be set free first, releasing it from the task of transmitting *something* as precisely as possible. I hope to demonstrate that such mediality is what the avant-garde has striven for and simultaneously what the life sciences recognize as a hindrance to their scientific claims.

## LINES IN ART AND SCIENCE CIRCA 1900

O'Hara's lines stand in the tradition of the *liberation of the line* in the avant-garde, as Georg Witte has worked out using the concept of a 'phenomenality of the line', that is, lines that do not subject themselves to writing. Witte cites the Realistic Manifesto by Gabo/ Pevsner:

*We renounce in a line, its descriptive value; in real life there are no descriptive lines, description is an accidental trace of a man on things, it is not bound up with the essential life and constant structure of the body. Descriptiveness is an element of graphic illustration and decoration. We affirm the line only as a direction of the static forces and their rhythm in objects.*

While the line in that case functioned as the *"mediation of the constructive principle as such,"* (Witte) mediation itself is at the fore in O'Hara's practice.

Concurrently with this artistic release of the line, a fixation on and disciplining of the line emerged in the life sciences starting in the mid-19th century.

*Whatever can be conceptualized as time, e.g., as phase, pulse, frequency, or rhythm [...] becomes an object of almost universal attention. Whatever is in motion, whatever even just stirs, is registered, noted down and written without recourse to the symbolic order of the alphabet. Rieger*

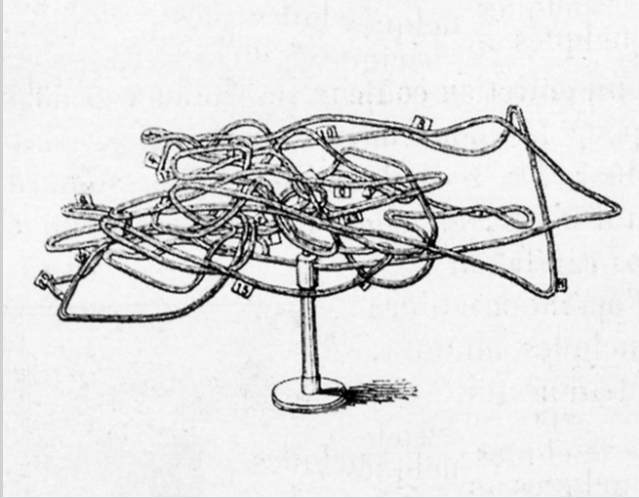
Even cinematography goes back to physiological movement images, according to Thomas Macho. According to Étienne-Jules Marey, who defined movement as the function of life, the most various physical phenomena are reduced to a few parameters, to *"number, duration and force"*, which become the main proponents of the *"graphic method"*,

*Blood pressure, temperature, electric [...] currents [...] and weight, volume, tractive and compressive forces, trajectories, flow rates (or sales volumes in an economic sense), all the way to durations (the times of reign of queens) or rhythms [...], could be precisely expressed in the graphic method.*

Correspondingly, all physical movements and movement sequences could be transferred to curve diagrams, so that the introduction of the "graphic method" was accompanied by a momentous change in the notation of life: *"Life is given a contour no longer under the sign of letters but under the sign of curves."* (Rieger) The fact that recorded life now appears in lines owes its origins to the organic understanding of life—blood circulation, metabo-



**FIG. 1:** Breath registration via belt tubes, from: Edward Scripture: Anwendung der graphischen Methode auf Sprache und Gesang, Leipzig 1927, p. 9, fig. 5.



**FIG. 2:** Wire-frame figure of an earthquake in Japan on 01/05/1887, fifty times enlargement of the quake at the measured spot, from: Michel Frizot: Les courbes du temps. L'image graphique et la sensation temporelle, in: same. (ed.): Aux Origines de l'abstraction, exhibition catalogue, Musée d'Orsay, Paris 2003, p. 68-83, fig. p.73.

lism and muscle contraction—the pulsing and movements of which were recorded by pressure-sensitive apparatuses [FIG. 1].

While the graphic method was first applied in the life sciences such as physiology and medicine—it was initially developed by Marey to diagnose illnesses—it was soon employed in other fields as well: e.g., in geology, when earthquakes were recorded with the new graphic methods and when wire-frame models were produced [FIG. 2], but also in the scientific definition of work. In the 1910s, for instance, Frank B. Gilbreth, a building contractor, inventor and close colleague of economist Charles Frederic Taylor, developed together with psychologist Lilian Gilbreth, a specific form of cinematographic movement notation to optimize work processes with the



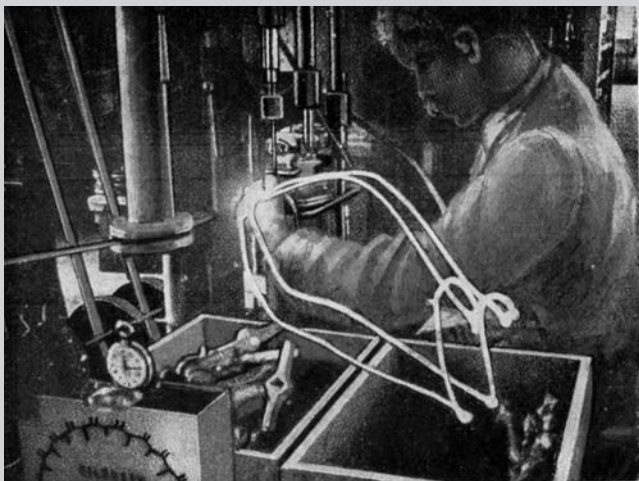


FIG. 3: Frank B. Gilbreth: Cyklographische Aufnahme, from: Frank B. Gilbreth/Lilian M. Gilbreth: Angewandte Bewegungsstudien. Neun Vorträge aus der Praxis der wissenschaftlichen Betriebsführung, Berlin 1920, p. 65.

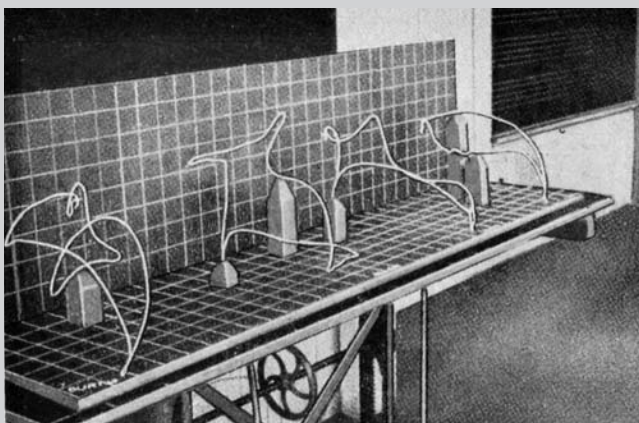


FIG. 4: Frank B. Gilbreth: Drahtmodelle, die den Fortschritt in der Erlernung des besten Arbeitsverfahrens zeigen, from: Frank B. Gilbreth/Lilian M. Gilbreth: Angewandte Bewegungsstudien. Neun Vorträge aus der Praxis der wissenschaftlichen Betriebsführung, Berlin 1920, p. 65.

aid of recorded light traces. The couple attempted to quantify the effort of human labour in craft-oriented production processes such as bricklaying, the packing of pieces of soap or the handling of machines in order to enhance efficiency by changing motion sequences. Gilbreth proved his optimization achievement by juxtaposing the “conventional” method with the new method showing a stopwatch in the picture. In *intertitles*, he edited the respective figures of the increase in efficiency. Moreover, Gilbreth further developed Marey’s recording method by attaching electric lights to the extremities so as to identify “superfluous” movements based on the light curves—a method that psychologist Fritz Giese went on to call the “*light trace method*” in 1937 [FIG. 3, 4]. Based on the light curves of the optimized movement, Gilbreth produced wire-frame models depicting the ideal motion sequences of a certain activity, which were meant to be practiced. The German scholar and linguist Eduard Sievers further developed this sculptural form, when in the 1920s he sought to condense the spirit of the respective author via sound analysis of texts read out loud, and—inspired by Gilbreth’s models—bent this information into wire figures. With the dis-

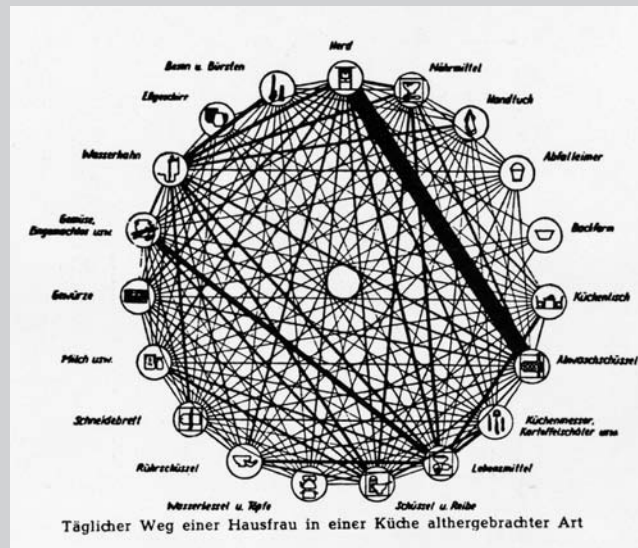


FIG. 5: Paths in the household, from: Baurundschau 1951, p. 326.

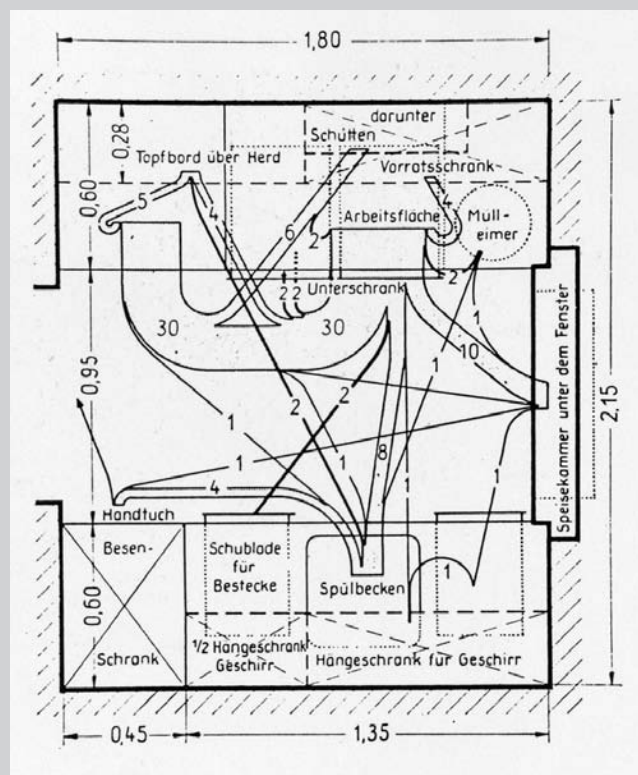


FIG. 6: Paths in the household, from: Bauen und Wohnen 1947, p. 179.

approval of Sievers, German scholar Julius Peters further tried using sound analyses to attribute texts by unknown authors to the spirit of a specific author, i.e. Eckermann or Goethe.

Beyond such specialized scientific interests, Gilbreth’s method—as *Taylorization* of the working world—entered into both the history of industrialization and the history of rationalizing and mechanizing of households,

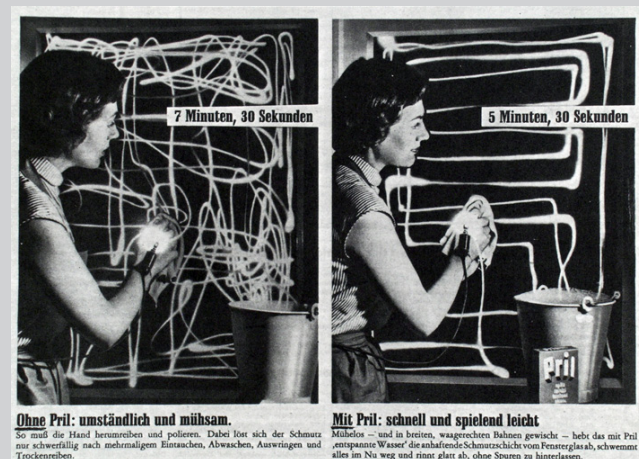


FIG. 7: Pril advertisement, from: Perlionzeit, p. 131.



FIG. 8: Henri-Georges Clouzot: Le Mystère Picasso, 1956, film still.

when, for example, studies on the optimization of the work paths of housewives were carried out in the 1950s [FIG. 5, 6]. According to this kind of thinking about efficiency, Gilbreth’s *chronocyclograph* method was also used in advertising to vividly demonstrate the time saved by using liquid scrubbing agents [FIG. 7].

The *chronocyclographic* method was also staged as an extravagant aesthetics, with the aim of celebrating artistic genius. In the film *Le Mystère Picasso* by Henri-Georges Clouzot from 1956, Picasso uses a flashlight to paint figures in the air [FIG. 8]. A very recent, technologically sophisticated development of this method of rendering movement visible is GPS—the Global Positioning System—a system allowing the localization of all objects and persons equipped with such a sending device via satellite. Artist Esther Polak employs such a device from surveillance technology to visualize Amsterdam from a special perspective. With it she records—as art—how residents across all social strata use the city. This wide range of examples and forms of application shows how the new method has penetrated numerous fields, from work science to pop culture, and become differentiated according to the respective purposes. From today’s perspective one can read much more than specific references to graphically recorded movement, seeing instead, implications for social definitions and gender codings of surplus and efficiency.

## ART AS OBSOLETE SCIENCE?

Both the physiological graphic since Marey and O’Hara’s transmissions are to be understood as experimental recording methods belonging to the same epistemic space of writing life. O’Hara’s drawings have in common with scientific methods, the fixing of movement traces. There is also similarity between the artist and the graphic recording apparatuses, for her method is technical in the sense of a physical ability or skill, Greek: *techné*, to which a trained bodily relaxation belongs. She calls her activities seismographic. In a similar way, the technical functioning of the earthquake recorders depends on whether the recording pin is mounted in its fixture so that it can freely oscillate. There is also a proximity regarding subject matter when O’Hara records heart movements through MRI devices. The invention of the pulse curve recorder is situated at the beginning of the field of graphic notation of motion. Physiologist Carl Ludwig from Leipzig was able

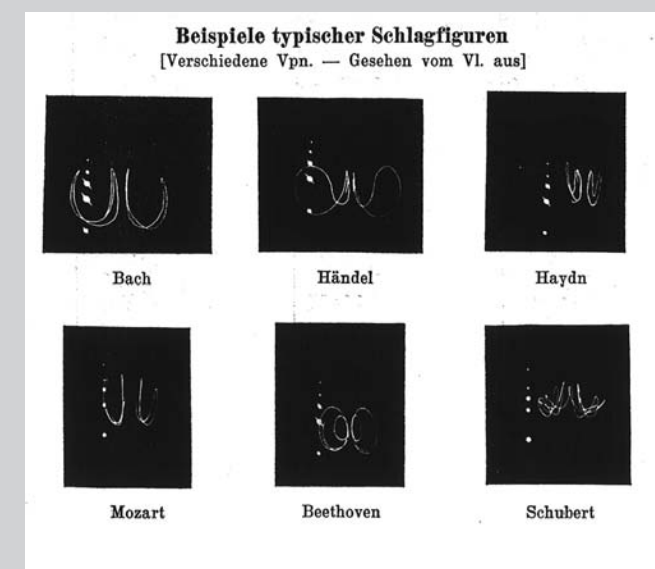


FIG. 9: Fritz Giese: conducting movements, from: Fritz Giese: Individuum und Epoche in Taktierbewegungen bei verschiedenen Komponisten, in: Archiv für die gesamte Psychologie, Vol. 90/1934, p. 380–426, fig. p. 425 (detail).

to depict blood pressure for the first time in waves using the *kymograph*, the wave writer, in 1847. Psychologist and physiologist Edward Wheeler Scripture in turn attempted to apply graphic notation to song and make it productive for teaching deaf-mute persons. Here, one must again mention O’Hara’s *Live Transmission* of musicians in performance. While psychophysicist Fritz Giese employed graphic notation to establish an experimentally oriented cultural psychology in a fixed movement track, the stroke curves of composers [FIG. 9], a “*graphic ‘epochal curve’*” were to become readable. O’Hara transmits by drawing the stroke movements of conductors, although it is not at all her intention to identify specific personalities.

The lines of this artist and the curves of the physiologists and work researchers have another thing in common: the aesthetic valence and thus ambivalence of their objects. According to Rheinberger/Hagner, the new technology of *graphomization* in the life sciences drew its discursive power from the



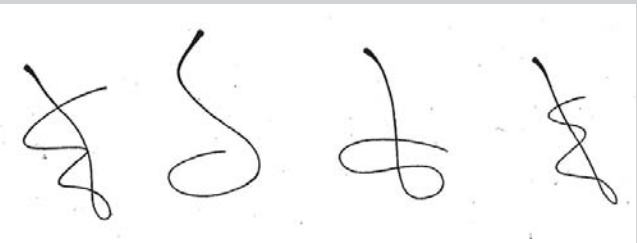


FIG. 10: Movement images for gestures, from: Auguste Flach: Die Psychologie der Ausdrucksbewegung, in: Archiv für die gesamte Psychologie 65 (1928), p. 435-534, fig. p. 476.

promise that nature and life would themselves write. Or, as Marey claims, there is a *natural graphic*, in the language of the phenomena themselves.

But the informative value of the phenomena was quickly called into doubt, and there was the obvious fear that these curves might only be play or worse, merely a means of decoration. These suspicions arose with the idea that the apparatuses, with their inherent electrical vibrations, might write *their own* vibrations more accurately than those of the phenomena being recorded. Already in 1855, the argument against Carl Ludwig was that the lines of his pulse curve writer were mere artificial products and the apparatus would write often quite illusory things. At the time, it quickly became clear that if the graph lacked other symbolic systems such as numbers and writing, it would only be a swaying line that is purely gestural and, as an aesthetic line, suspend any possible meaning. The high mediality of lines makes them aesthetically attractive, but dubious in scientific claims to objectivity, as can be seen in movement curves of gestures notated in experimental physiology and psychology when they explore movements of expression [FIG. 10]. For the same reason, Siegfried Giedion in his 1948 text *Mechanization Takes Command* could establish formal analogical relationships between scientific curves and artworks, when he juxtaposed works by Joan Miró with the wire-frame models created by Gilbreth.

However, not only the aesthetic side of scientific curves is highlighted in the convergence of art and science. Concepts that are attributable to art, such as surplus and dysfunctionality, lose their art-specific evidence. For as Rheinberger stresses, such qualities are inherent to the experimental sciences. He refers to Derrida's concept of *différance* as a *blind tactic* and *empirical straying of writing* that, according to Rheinberger, is *closely linked to the nature of means in which the experimental text writes itself*. He continues:

*It lies in the nature of these means, material, graphematic entities, that they contain the conditions of the possibility of their surplus. They contain more and other possibilities of action than are momentarily assigned to them. Surplus embodies the historical movement of the trace: it is something that crosses the border in which the game appears. As surplus, it eludes any definition. On the other hand it makes the border appear by infringing on it. It defines that which it evades. The movement of surplus is recurrent.*

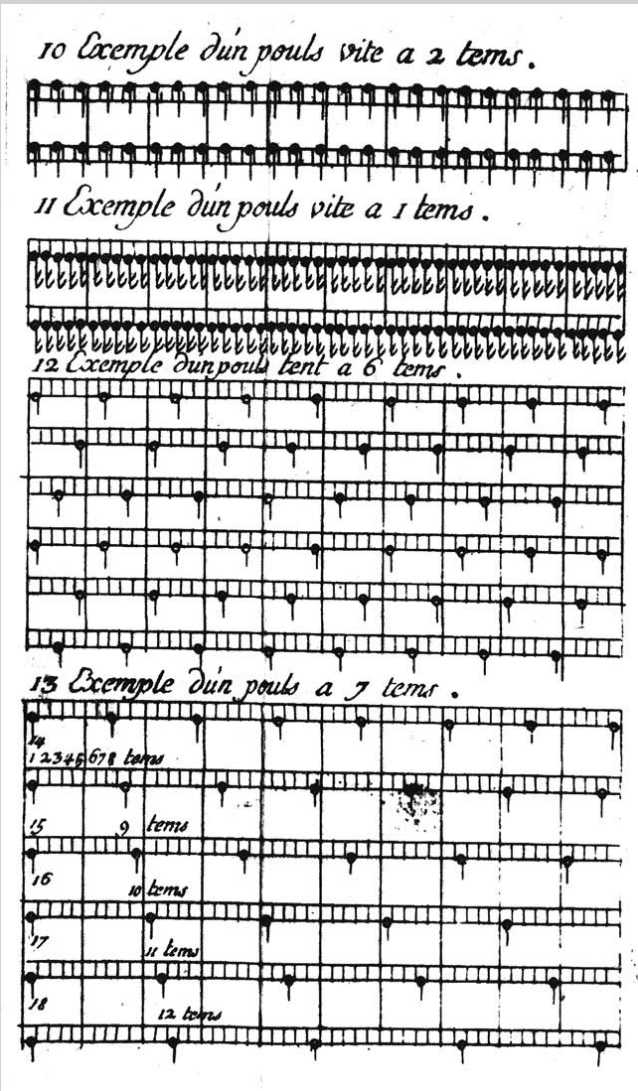


FIG. 11: François Nicolas Marquet: Nouvelle Méthode facile et curieuse, pour apprendre par les Notes de Musique à connoître le Puls de l'Homme ..., Nancy 1747). Here from Werner Kümmler: Puls und Musik (16.–18. Jahrhundert), in: Medizinhistorisches Journal, Vol. 3, No. 4, 1968, p. 269-293, fig. p. 283.

A symptom of such a surplus is for example the research conducted by German scholar Peters, who bent Goethe's *spirit* into wire figures. Dysfunctional obsession is therefore not necessarily a privilege of art—it usually remains disregarded in the field of science. The same is true of surplus that, following Immanuel Kant's Critique of Pure Reason, paragonal phenomenon belongs to the subject matter of pure aesthetic, and thus precisely not scientific judgement.

So to contextualize O'Hara's drawings within the life and experimental sciences, ranging from clinical diagnostics to work research to surveillance technologies, means not placing art per se in opposition to science or technology. Instead, both become equally describable as specific manifestations of a new modern paradigm of graphism centered around the

phenomena of life. Art does not distinguish itself from other fields merely through certain artistic methods, but through the fact that similar methods are subordinate to other ends or interests. These interests in turn modify the methods themselves, so that a practice differentiates itself into a scientific or artistic one. Instead of viewing the fields of art on the one side and life sciences on the other, a synthesis elucidates the differences between the respective visualizations of life in a clearer way. O'Hara's drawings are certainly beyond any biopolitical exploitability—a goal that determined the scientific recordings of life. But they also do not comply with the usual differentiation—preferred in cultural-critical art theory—according to which technical criteria per se are pitted against artistic subjectivity. O'Hara's drawings are not art with increased subjectivity wrested from technology. They also cannot be described in the register of an artistic “*scripturalism*” and its “*ostentatious handwriting performance*” (Witte) as cultivated the 1960s and 70s by artists such as Cy Twombly against the media-historically contrasted backdrop of mechanized and automated writing techniques. With her mode of transmission, O'Hara dispenses with both the originality and subjectivity of handwriting as well as the anthropocentric, frequently compensational function of art when it distinguishes itself from the technical and thus dehumanized contrast background. The self-image of this artist as a human registering apparatus is instead characterized by desubjectification.

Beyond the obvious differences of art and science, e.g., density and direction of strokes, duration of the recording or the context and the setting in which the recording takes place, the following is decisive for the meaning of notation in the case of O'Hara's oeuvre. She eschews both the normativity of the recording apparatus, and an interest in systematization and comparability, as well as any interest in lending the phenomena a voice. O'Hara does not transmit the movement to an index of a function: her lines do not indicate illnesses, the expenditure of energy in work processes or the spirit of an author or an age. Her graphic devices, on the other hand, allow a practice, according to Soraya de Chadarevian,

*...that forces nature to write the duration and course of events on paper and thus make them graphically visible, analyzable and communicable. Hence, the universality of the phenomena is based on the negotiated standardizations of a shared experimental practice and the accordant standardization of experience.*

That a universality is owed to negotiation and codification in the first place, is something that its inventor, Marey, failed to recognize. He hoped that his method would provide the same universality as his model, musical notation, which, however, is itself subject to historical norms and standards. Heart sounds, for instance, were noted down prior to the invention of graphic notation according to a historically specific, musical convention—in the 17th century in the form of the minuet [FIG. 11].

If one considers that Gilbreth's principle of efficiency consisted precisely in rationalizing superfluous movements, one can discern in O'Hara that the deviation from the standard curve is an artistic principle. Moreover, by abandoning her personality in the situation when she is registering what she sees, she can, to a certain extent, suspend what her hand has prac-

ticed and produce a large variety of visual phenomena by acting intersubjectively, something which eludes all standardization. Her practice seems to be informed by the surplus and dysfunctionality that, as Rheinberger explicated, defines the field of science writing life as marginal phenomena, but has no place inside science. Her art, then, is not opposed to science, but retains the aesthetic and dysfunctional obsessiveness that constitute process but must remain invisible in science for reasons of quantification and codification.

Yet exactly where art reclaims such a dysfunctional, aesthetic place lies the potential of shifting the concept of notation. What applies well to O'Hara's concentration on direction vectors and impulses is the new formulation of the concept of notation as proposed by Gilles Deleuze and Félix Guattari. Against the semiotic definition following Charles S. Peirce, according to which notation is bound to a certain degree of discretion and repetition, their concept of notation, schooled on John Cage, is much more fluid and projective. John Rajchman writes in reference to A Thousand Plateaus:

*The idea of notation liberates itself from merely elaborating as certain code [...]. It instead becomes a diagrammatic affair, a way of drawing lines instead of determining points. [...] By notation thus switching from code to diagram, the image of thought changes from the already given method to a search for living ideas.*

Here, drawing a line means following a life, i.e., an arbitrary and singular life—an ethical imperative that in the light of O'Hara's drawings can be read as an artistic program. Within this constellation of Cage, O'Hara, and Deleuze / Guattari—and O'Hara has transmitted an array of Cage performances live—notation is no longer a specific sign system but a process of recording motion that eludes codification. But precisely as a sign of life, *movement* exists beyond notation. Life exists within forms that represent and engender it. While physiologists recorded heart sounds first musically and later graphically, O'Hara chooses a non-coded form of visibility when drawing lines based on the heart movements of an MRI transmission and its intonation by Sarah Frances. Against the concept of representation and code, Deleuze formulated the concept of the *indefinite*—as form that eludes form. With her *Live Transmissions*, O'Hara, no differently than in the sciences, engenders the phenomena of life as graphic notation, albeit as formless form and with the important difference that she raises the aesthetic of lines and curves to *the actual subject-matter*, whose mediality and obsessiveness, the curve-writing sciences failed to include in their scientific claim.

*Translation from the German by Karl Hoffmann*



LIST OF LITERATURE

Giorgio Agamben: Notes on Gesture, Means Without End. Notes on Politics, Minneapolis, 2000.

Inke Arns/Mirjam Goller/Susanne Strätling/Georg Witte (eds.): Kinetographie, Berlin 2004.

Ulrich Bischoff: Kunst als Grenzbeschreitung: John Cage und die Moderne, exhibition catalogue, Staatsgalerie moderner Kunst, Munich 1991.

Cornelia Butler: Ends and Means, in: same: Afterimage. Drawing through Process, Cambridge, MA/London 1999, p. 81-112.

Soraya de Chadarevian: Die ›Methode der Kurven‹ in der Physiologie zwischen 1850 und 1900, in: Hans-Jörg Rheinberger/Michael Hagner (eds.): Die Experimentalisierung des Lebens. Experimentalsysteme in den biologischen Wissenschaften 1850/1950, Berlin 1993, p. 28-49.

Gilles Deleuze: Pure Immanence. Essays on A Life, New York 2001.

Fritz Giese: Methoden der Wirtschaftspsychologie, Berlin/Vienna 1927.

Fritz Giese: "Individuum und Epoche in Taktierbewegungen bei verschiedenen Komponisten," in: Archiv für die gesamte Psychologie, Vol. 90/1934, p. 380-426.

Frank B. Gilbreth: "Motion Study as an Increase of National Wealth," in: The American Industrial Opportunity, Annals of the American Academy of Political and Social Science, Vol. 59 (May 1915), p. 96-103.

Frank B. Gilbreth/Lilian M. Gilbreth: "Angewandte Bewegungsstudien." Neun Vorträge aus der Praxis der wissenschaftlichen Betriebsführung, Berlin 1920.

Werner Kümmel: "Puls und Musik" (16.–18. Jahrhundert), in: Medizinhistorisches Journal, Vol. 3, No. 4, 1968, p. 269-293.

Pamela Lee: "Some kind of duration: the temporality of drawing as process art," in: Cornelia Butler (ed.): Afterimage: Drawing through Process, Cambridge, MA/London 1999, p. 25-48.

Thomas Macho: Der Mensch ist ein betrunkenener Dorfmusikant, in: Renate Lachmann/Stefan Rieger (eds.): Text und Wissen. Technologische und anthropologische Aspekte, Tübingen 2003, p. 29-43.

Étienne-Jules Marey: Du mouvement dans les fonctions de la vie, Paris 1868.

Étienne-Jules Marey: La méthode graphique dans les sciences expérimentales et particulièrement en physiologie et en médecine, Paris 1878.

Morgan O'Hara: Live Transmission Vol. 4, Bergamo 2006.

John Rajchman: Die Kunst der Notation, in: Hubertus von Amelunxen/Dieter Appelt/Peter Weibel (eds. in collaboration with Angela Lammert): Notation. Kalkül und Form in den Künsten, Akademie der Künste, Berlin/ZKM Karlsruhe 2008, p. 68-75.

Hans-Jörg Rheinberger: Experiment, Differenz, Schrift. Zur Geschichte epistemischer Dinge, Marburg 1992.

Hans-Jörg Rheinberger/Michael Hagner (eds.): Die Experimentalisierung des Lebens. Experimentalsysteme in den biologischen Wissenschaften 1850/1950, Berlin 1993.

Stefan Rieger: Die Gestalt der Kurve. Sichtbarkeiten in Blech und Draht, in: Susanne Straetling/Georg Witte (eds.): Sichtbarkeit der Schrift, Munich 2006, p. 119-138.

Stefan Rieger: Schall und Rauch. Eine Mediengeschichte der Kurve, Frankfurt a.M. 2009.

Georg Witte: Die Phänomenalität der Linie, in: Werner Busch/Oliver Jehle/Carolin Meister (eds.), Randgänge der Zeichnung, Munich 2007, p. 29-54.

These drawings have mostly been done with graphite on Bristol paper and range in size from 4x6 to 23x31 inches ,  
Morgan O'Hara



