

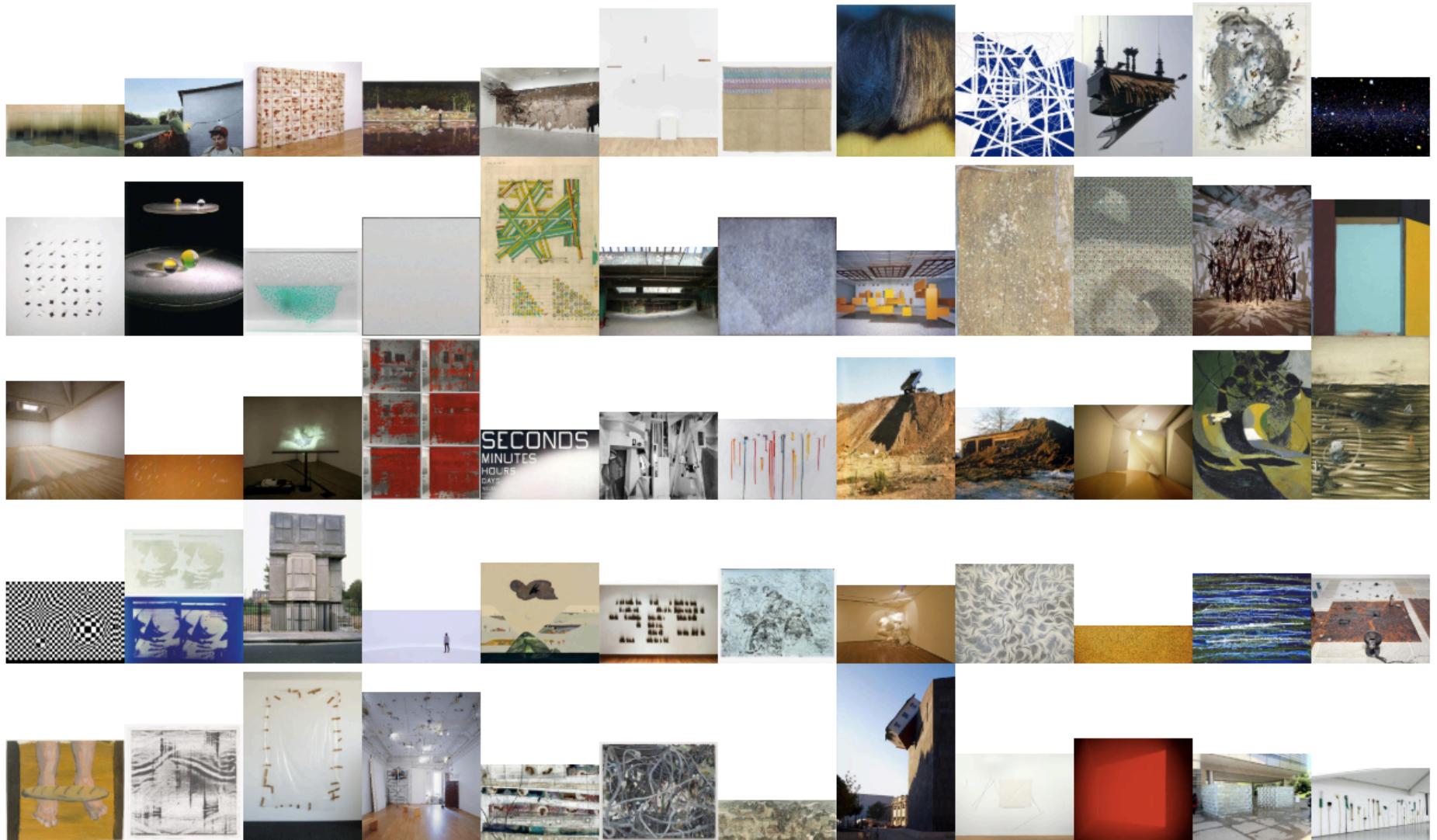
The rendering of statistical information into graphical form gives it a simplicity and legibility that hides every aspect of the original interpretive framework on which the statistical data were constructed. The graphical force conceals what the statistician knows very well—that no “data” pre-exist their parameterization.

Drucker, 2014

Seeking new ways of representing

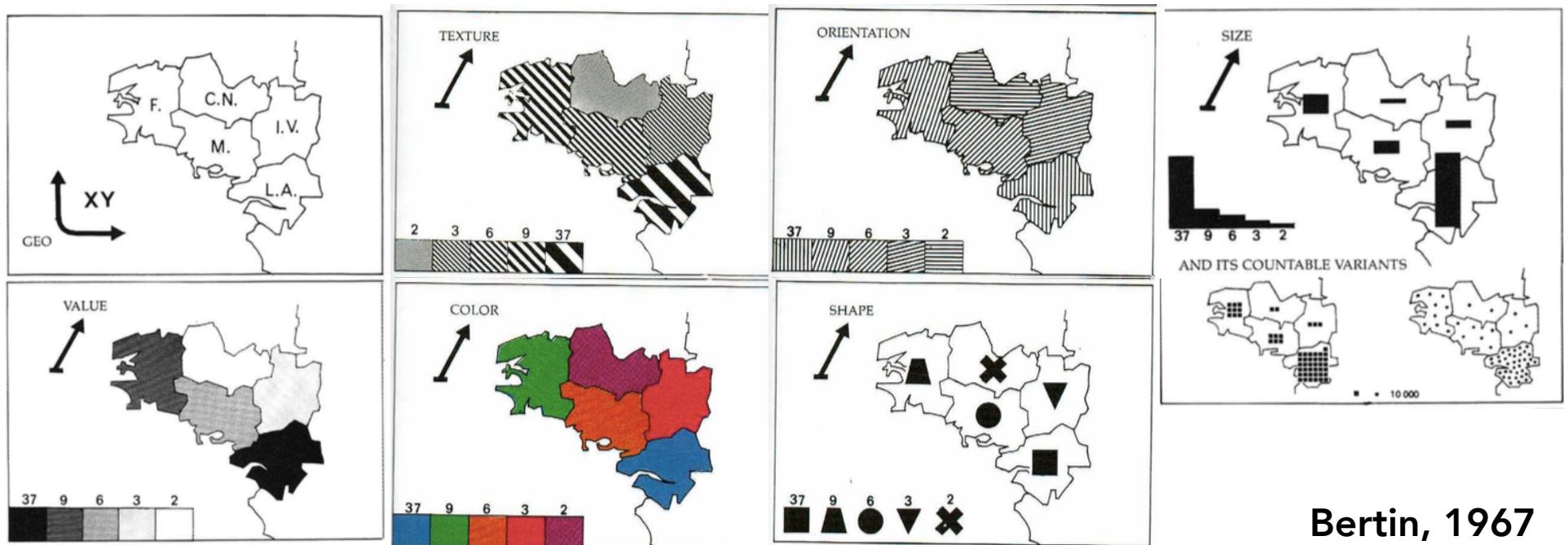
uncertainty

in Data Visualization: a Review of Fine Art

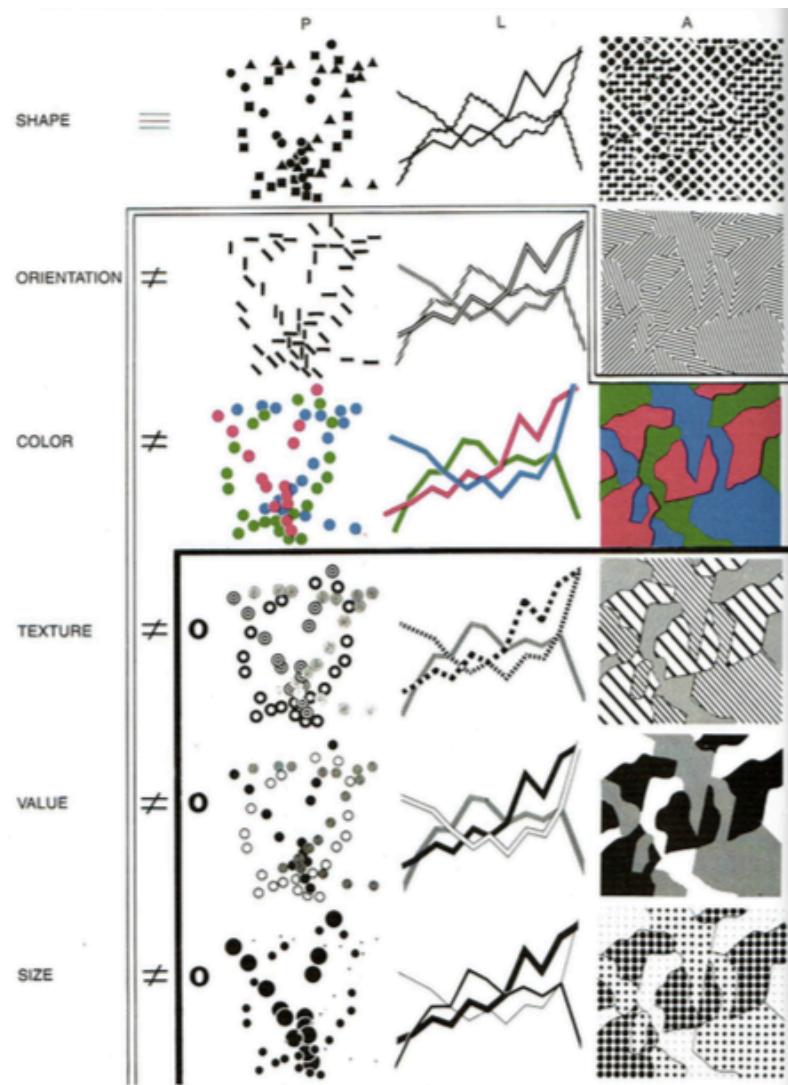


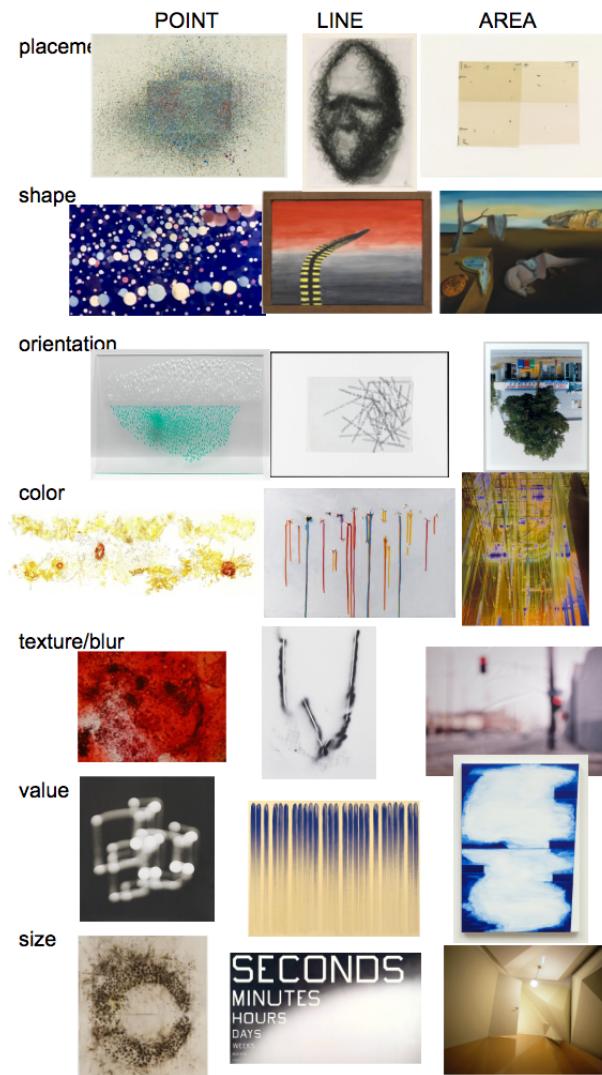
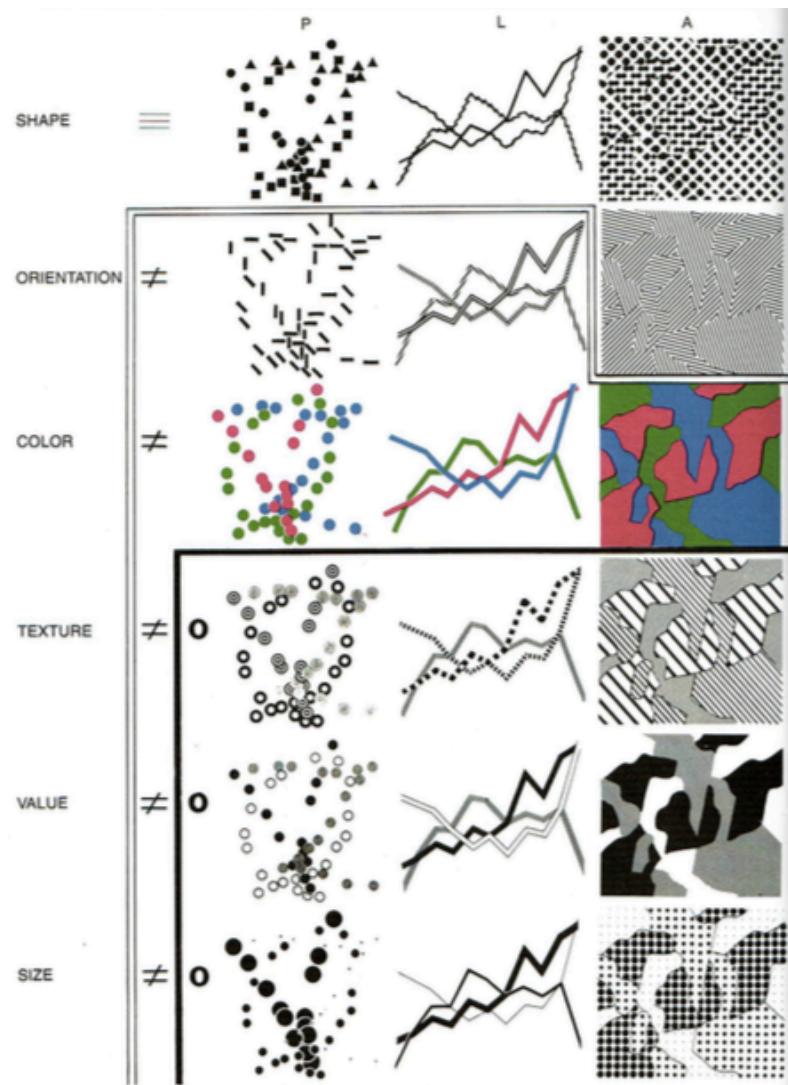
<u>medium</u>	<u>n</u>
painting	142
photography	68
drawing	55
sculpture	53
print	48
installation	35
video, film	3

Uncertainty



Bertin, 1967





Full_aaron and clare new attempt at classification FINAL

Secure | https://docs.google.com/spreadsheets/d/1wGr5kGW6wA83NCyWwVd4EbRiVswY5W7DQgF5oGLVkW0/edit#gid=0

Aaron

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive

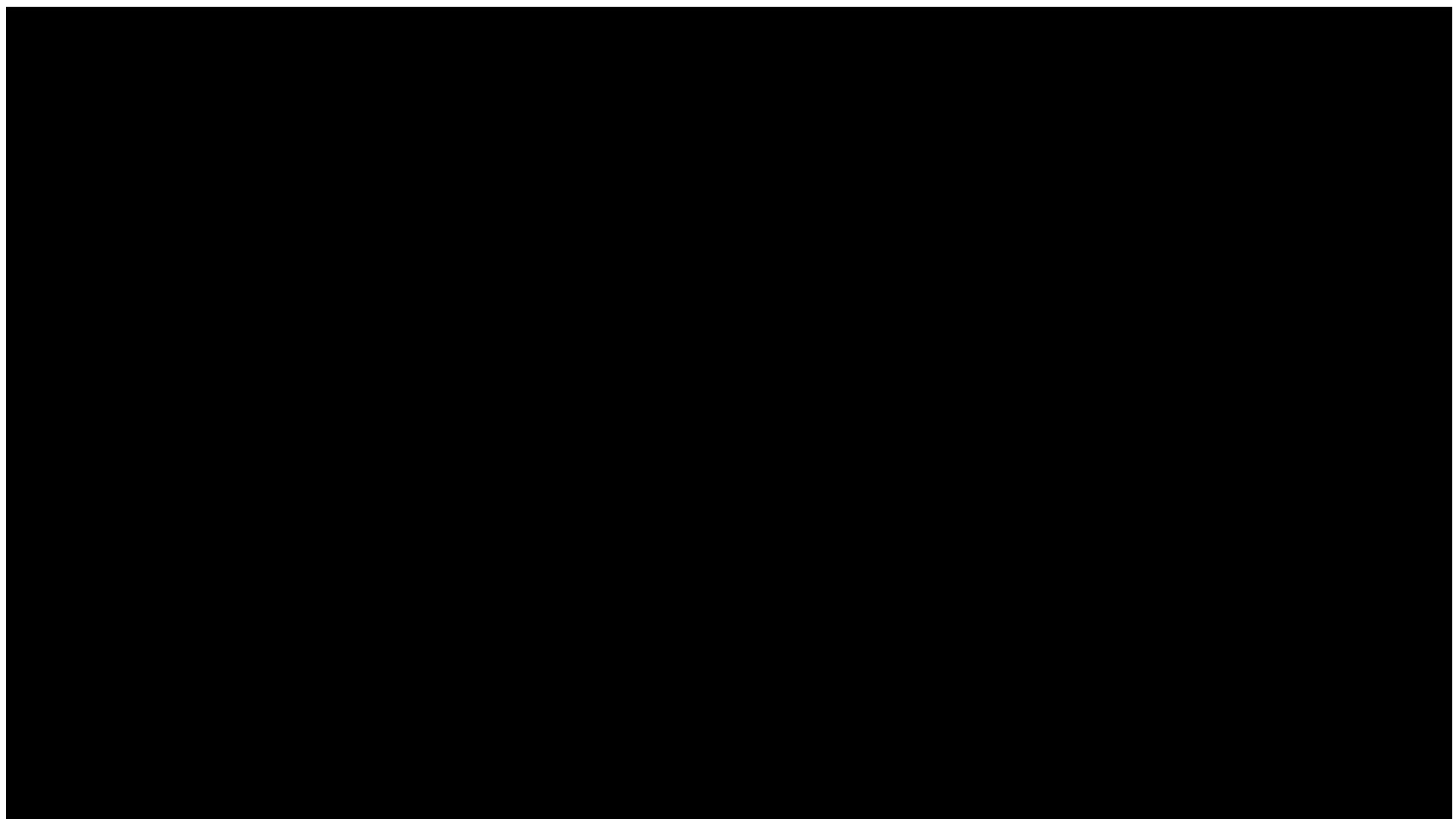
SHARE A

fx

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	Has Text	Medium	Size	Date	Representation	Kinetic	point	line	area	map	spatial dimension	placement	size	value	texture/blur	color	orientation	
2	painting, oil on canvas	106 x 94 cm	1913	TRUE					TRUE			TRUE	TRUE	and			TRUE	
3	sculpture, fabric, glass & metal	24 x 420 x 335 cm	1967	TRUE					TRUE		TRUE	TRUE	and	and	and		and	
4	painting, oil on canvas	156 x 184 cm	1958	TRUE					TRUE			and		TRUE	TRUE	TRUE	TRUE	
5	painting, oil, household paint on hardboard	213 x 152 cm	1957						TRUE		and	TRUE	and	and	TRUE		TRUE	
6	painting, mixed media on canvas	73 x 60 cm	1956						TRUE			and		and	TRUE		and	
7	painting, marker pen, acrylic on canvas	274 x 427 x 6 cm	1998					TRUE				TRUE	and	and	TRUE			
8	painting, oil on canvas	236 x 149 cm	1787	TRUE					TRUE			TRUE	TRUE	and		TRUE		
9	photo, digital print w/ acrylic on canvas	346 x 416 cm	1997	TRUE					TRUE		and	and	and	TRUE				
10	print, lithograph on paper	26 x 21 cm	1953						TRUE			and		and	and		TRUE	
11	installation, sculpture, coated glass	188 x 549 x 244 cm	1971						TRUE		TRUE	TRUE	and	TRUE	and			
12	photo, gelatin silver print on paper	24 x 24 cm	1936	TRUE					TRUE		and	and	and	and	and		TRUE	
13	print, lithograph on paper	43 x 29 cm	1956					TRUE	and			and	and	TRUE			and	
14	photo, gelatin silver print on paper	24 x 61 cm	1983	TRUE					TRUE			TRUE	TRUE				and	
15	photo, chromogenic print on paper	51 x 76 cm	2000	TRUE					TRUE		and	and	TRUE	TRUE	and	and		
16	photo, paper mounted onto aluminum	150 x 242 cm	1999	TRUE					TRUE		and	TRUE	and	TRUE	TRUE	TRUE		
17	painting, oil on hardboard	152 x 123 cm	1959					and	TRUE		and	TRUE	and	TRUE			and	
18	drawing, ink on paper	25 x 18 cm	1969					TRUE				and		TRUE	and		TRUE	
19	drawing, ink on paper	30 x 21 cm	1980	TRUE					TRUE			TRUE	and					
20	painting, oil on canvas	183 x 183 cm	1962	TRUE				and	TRUE			TRUE	TRUE	and	TRUE		and	
21	painting, acrylic on canvas	91 x 137 cm	1986	TRUE					TRUE			TRUE	TRUE	and				
22	painting, oil on canvas	62 x 75 x 2 cm	1910	SEMI					TRUE			and	TRUE	TRUE	and		and	
23	photo, digital print on paper	150 x 190 cm	2010	TRUE					TRUE		and	TRUE	and	TRUE	TRUE	and		
24	painting, oil on canvas	191 x 229 x 5 cm	1999	SEMI					TRUE		and	and	and	and	TRUE		TRUE	
25	installation, cardboard boxes, gauze, polyvinyl	203 x 323 x 20 cm	1970						TRUE		TRUE	TRUE	and	TRUE	TRUE	TRUE		
26	photo	243 x 196 cm	2000	TRUE					TRUE		and	TRUE	TRUE	TRUE	TRUE			
27	print, lithograph on paper	32 x 42 cm	1975	TRUE					TRUE		and	TRUE	TRUE	TRUE	TRUE			
28	drawing, charcoal on paper	102 x 93 cm	1987	SEMI					TRUE			TRUE	TRUE	TRUE	TRUE		TRUE	
29	drawing, chalk on blackboard	14 boards each 244 x 244 cm	1997	SEMI					TRUE	and		TRUE		TRUE	TRUE		and	
30	paint, oil on canvas	231 x 361 x 5 cm	1998	TRUE					TRUE			TRUE	TRUE	TRUE	TRUE	and		
31	installation, wood and mixed media	457 x 1748 x 160 cm	2009						and	TRUE		TRUE	TRUE	and	and		TRUE	
32	sculpture, wood, glass & paint on canvas	40 x 130 x 90 cm	1913						TRUE			TRUE	TRUE					
33	painting, oil on canvas	110 x 130 x 2 cm	2004	TRUE					TRUE			TRUE	and	TRUE	and	and	TRUE	
34	painting, oil on canvas	125 x 108 cm	1921	TRUE					TRUE			TRUE	TRUE					
35																		

Sheet1

Explore



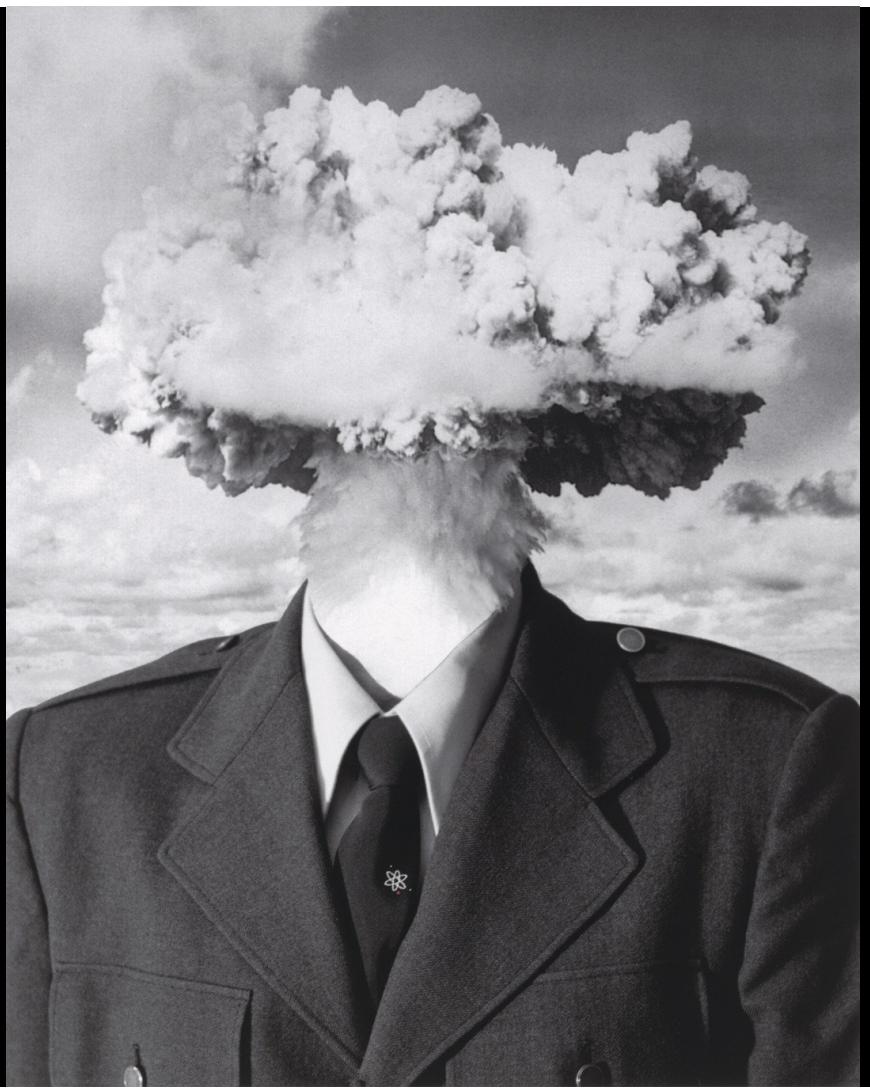
placement

given location on the planar dimensions









shape

a mark with a constant size can nonetheless have an infinite number of different shapes



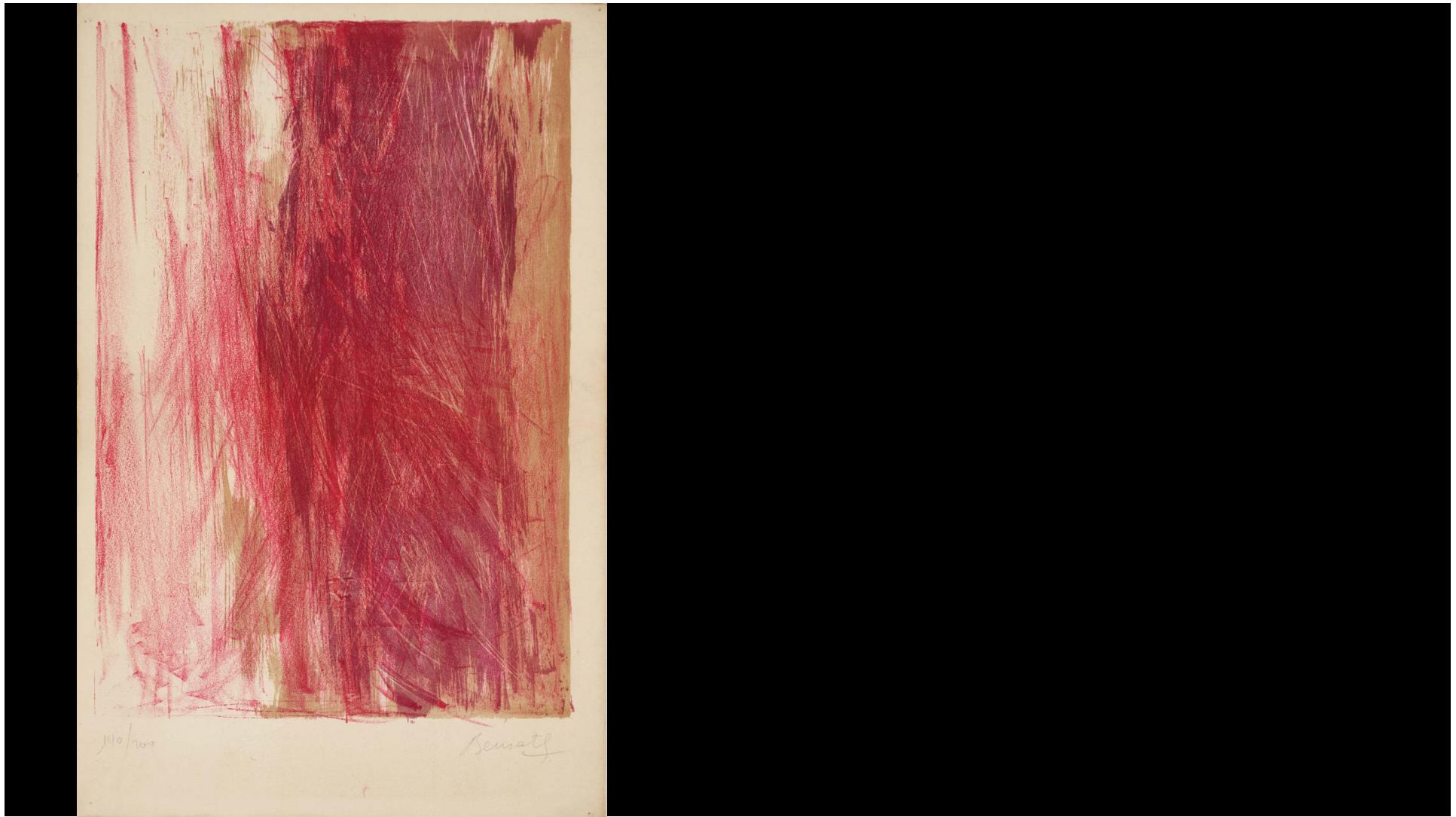


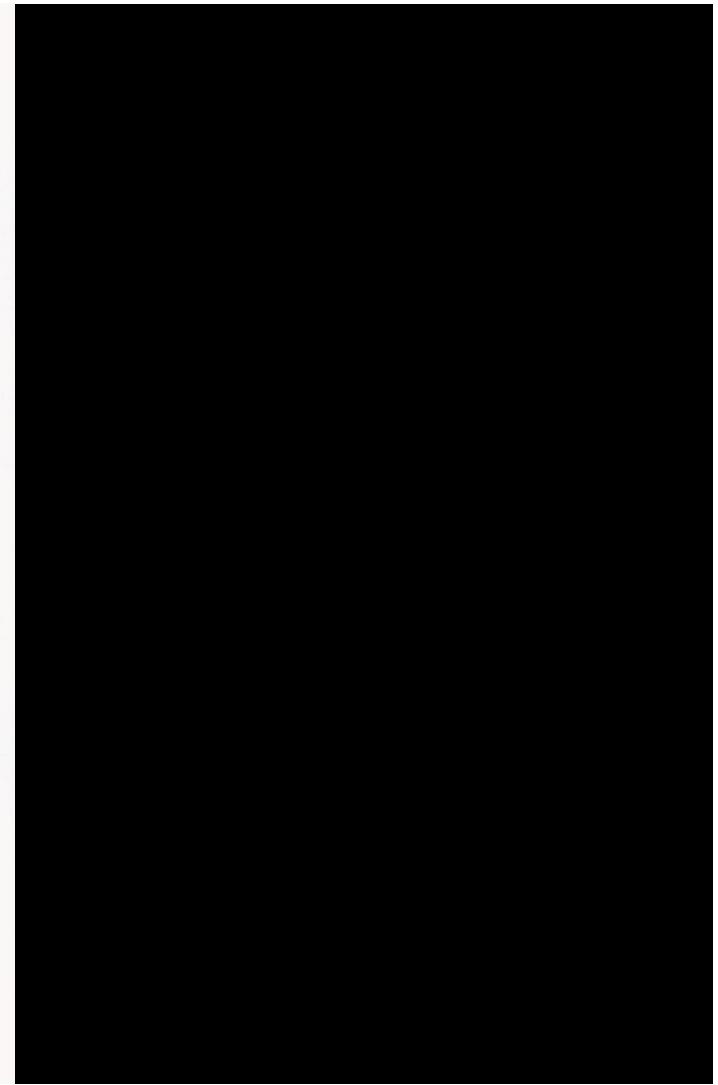
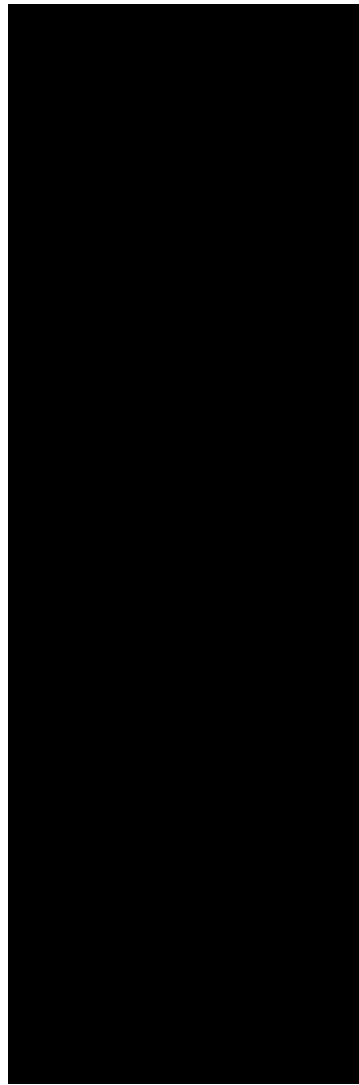




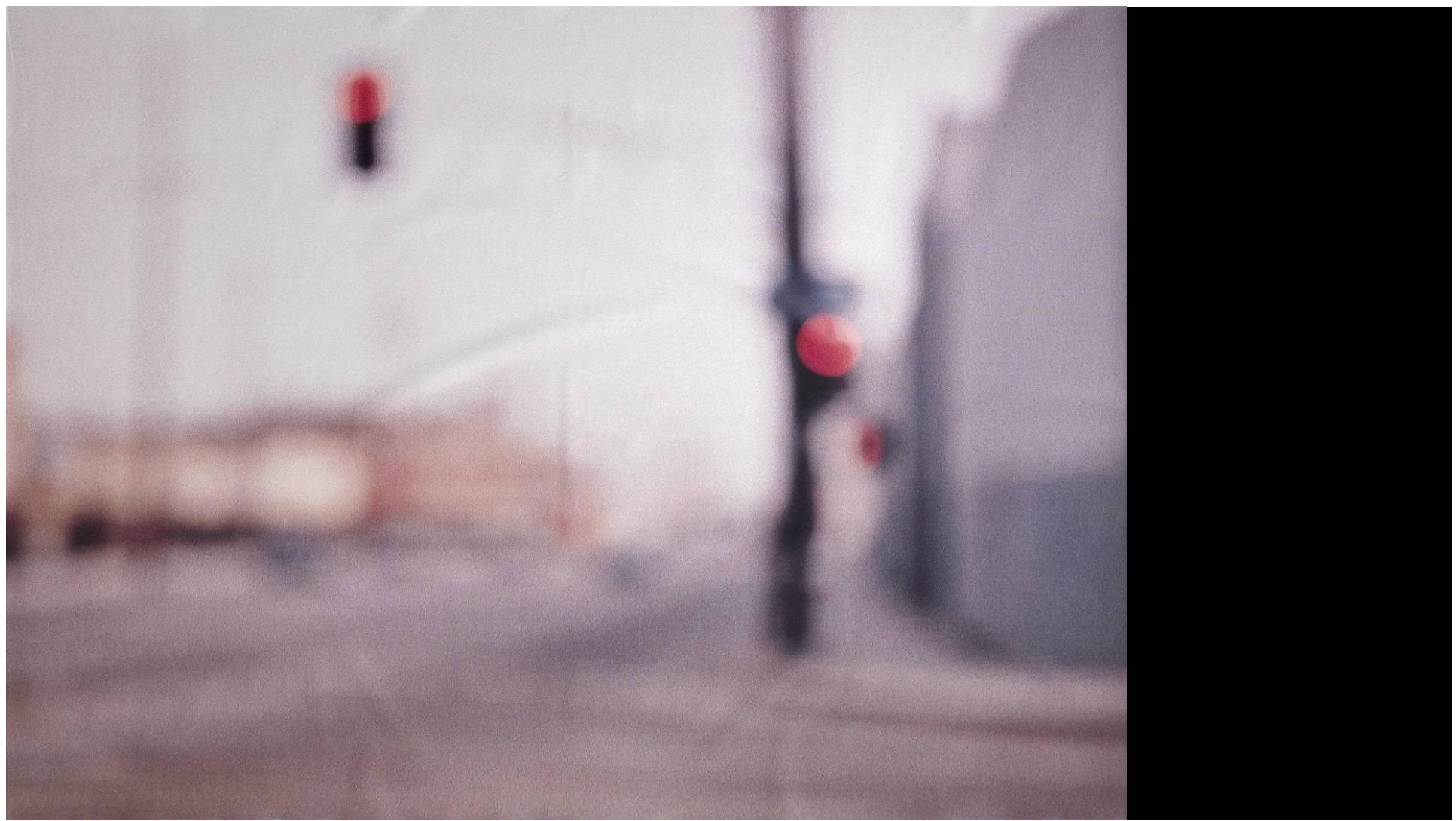
texture

variation in the fineness or coarseness of an area having a given value; includes blur



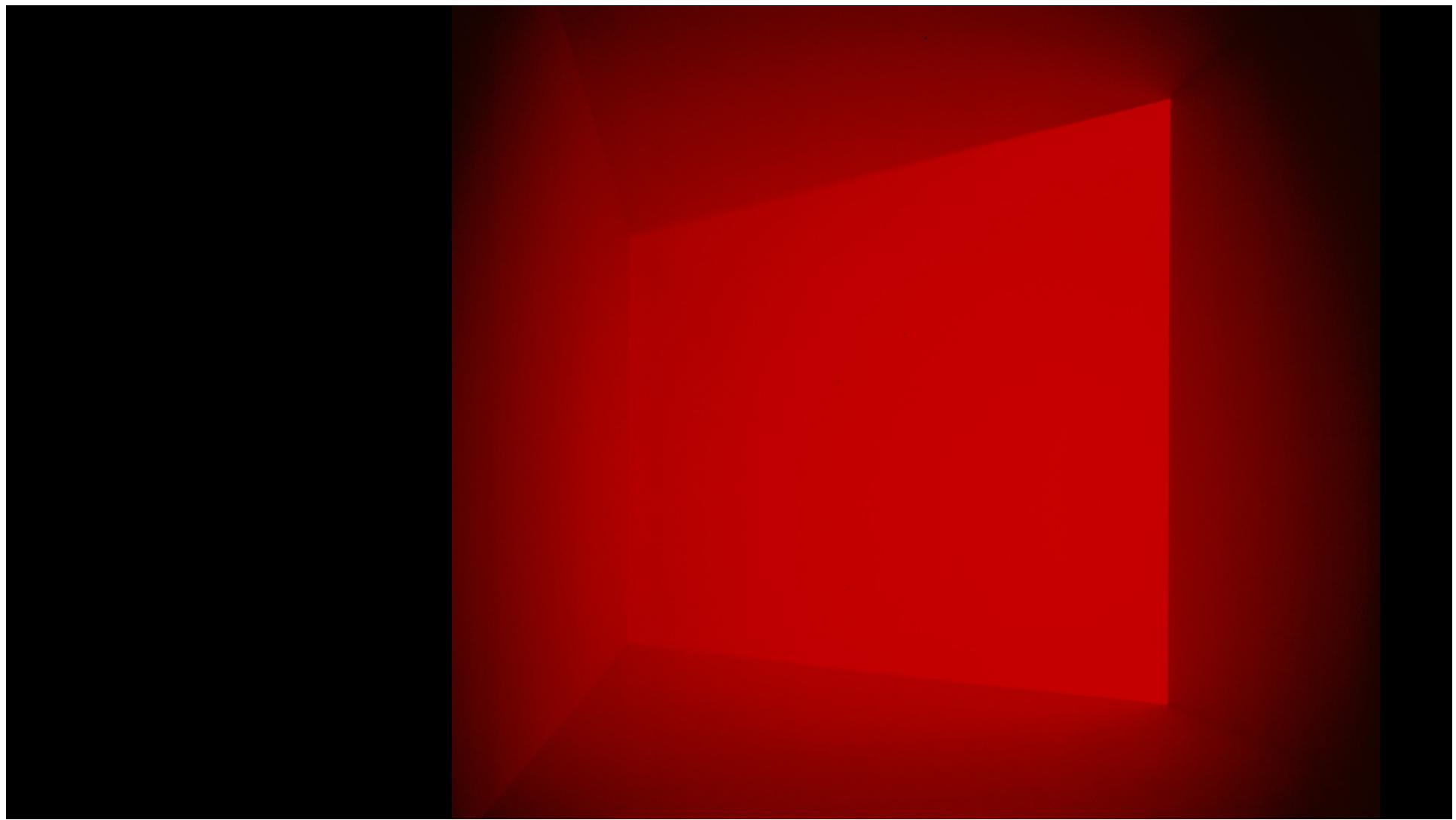






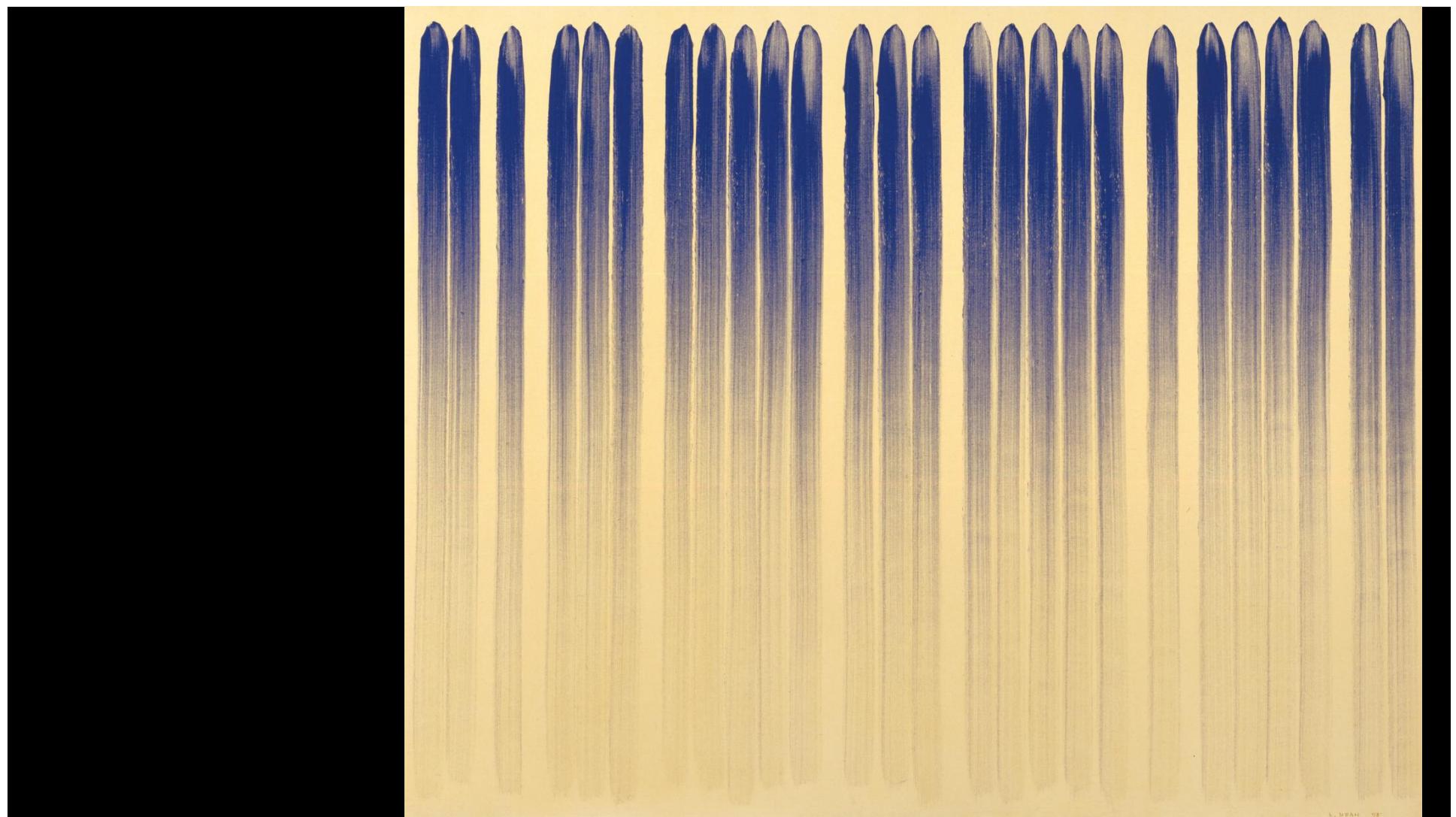
value

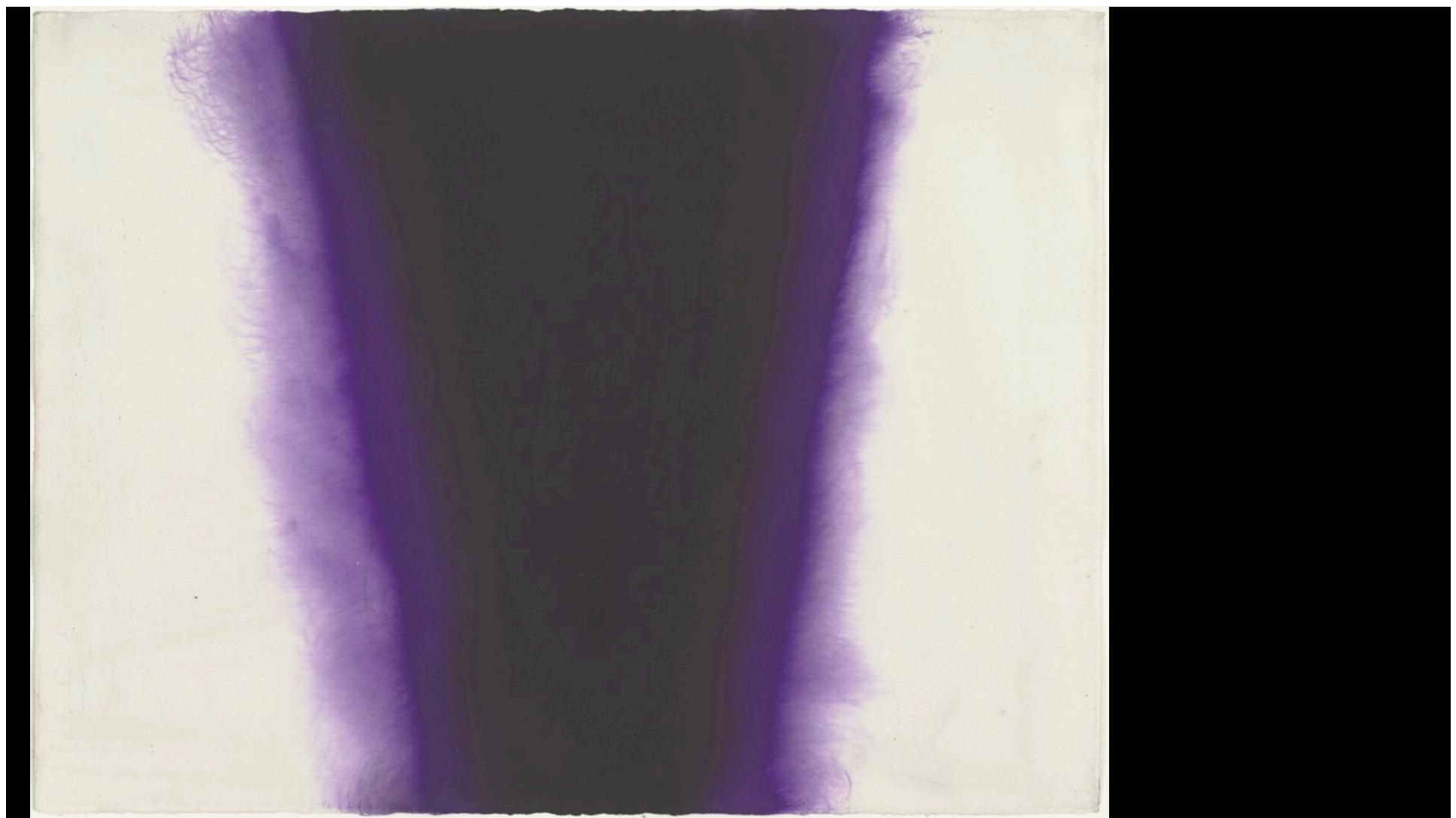
the various degrees between white and
black

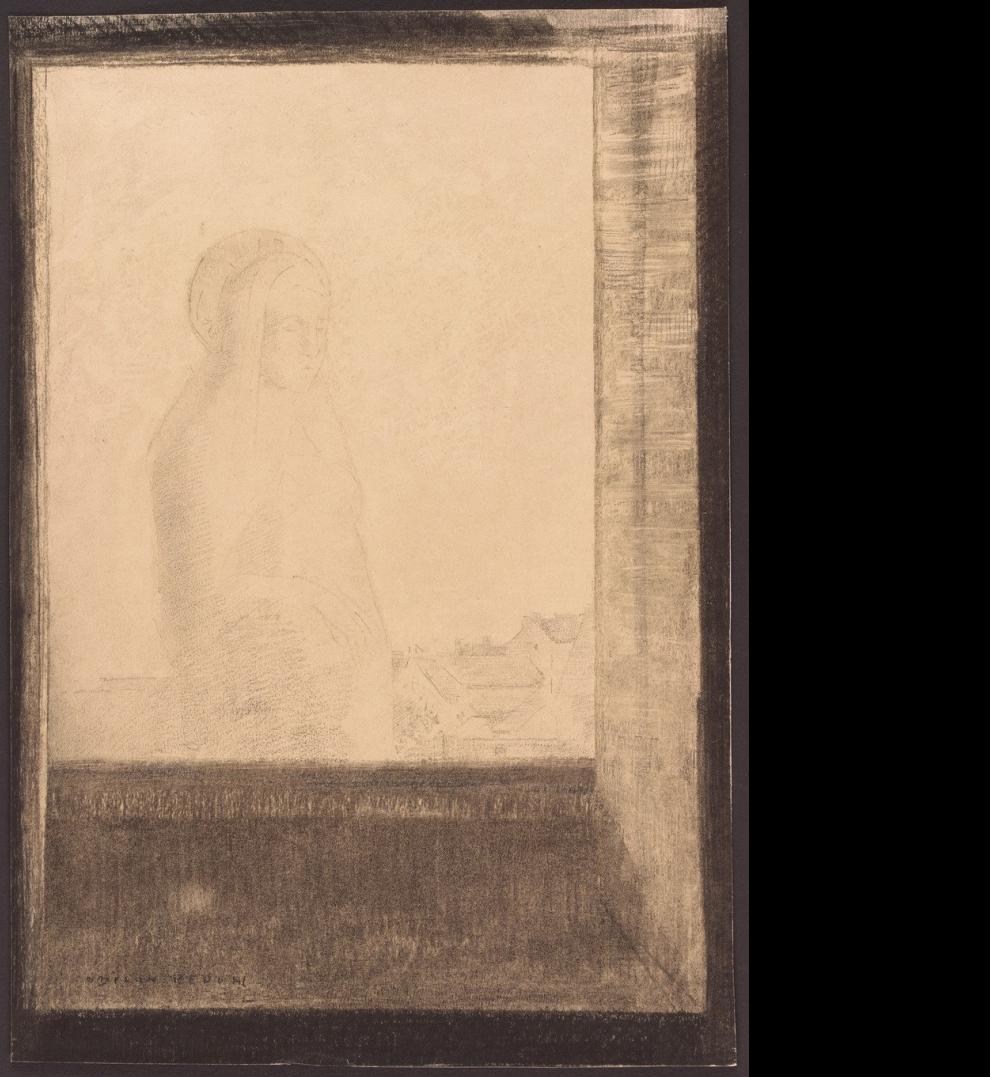




L. Verner

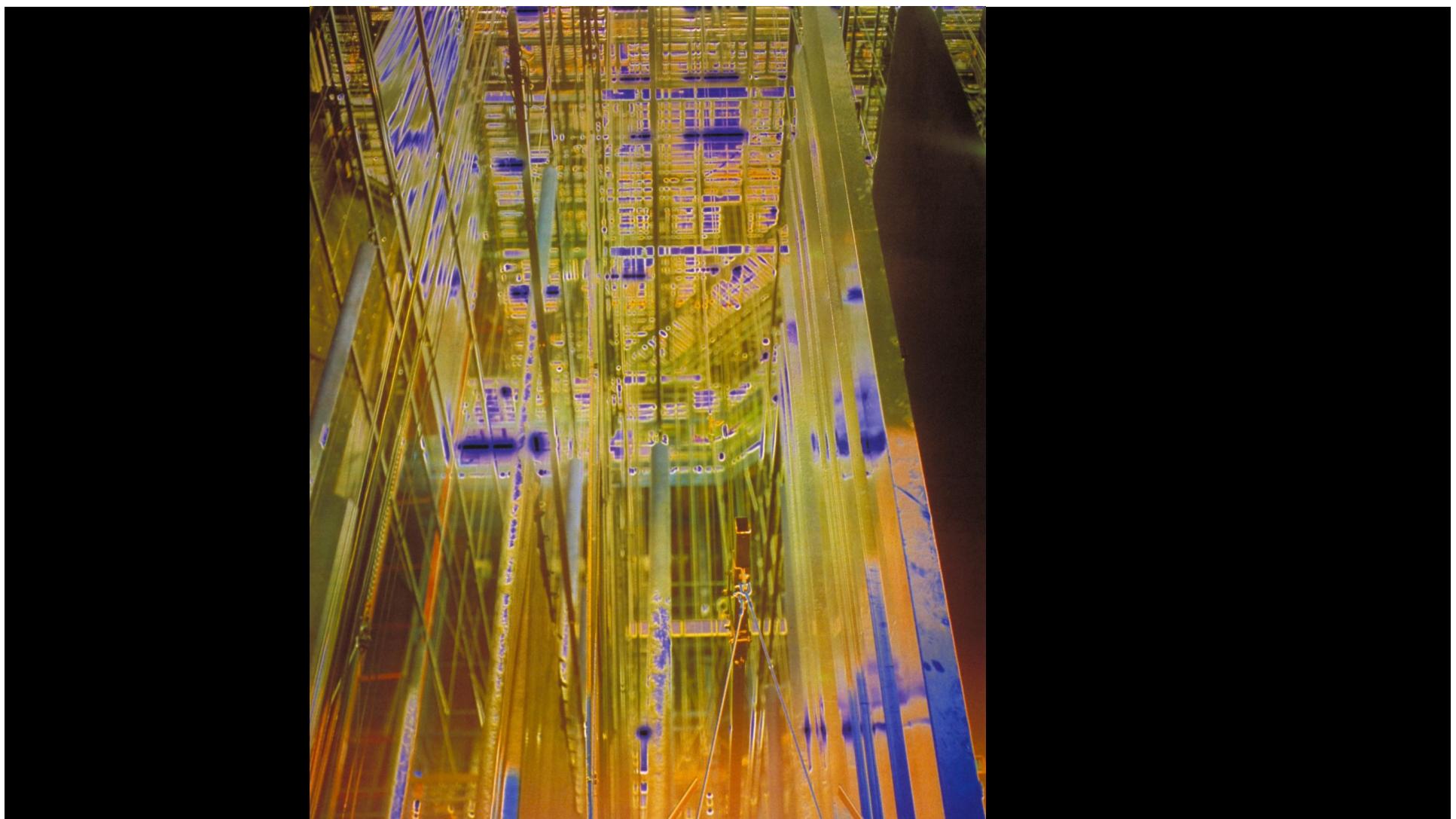






color

hue, using the repertoire of colored sensations which can be produced at equal value



size

varyations in height, width, area

SECONDS

MINUTES

HOURS

DAYS

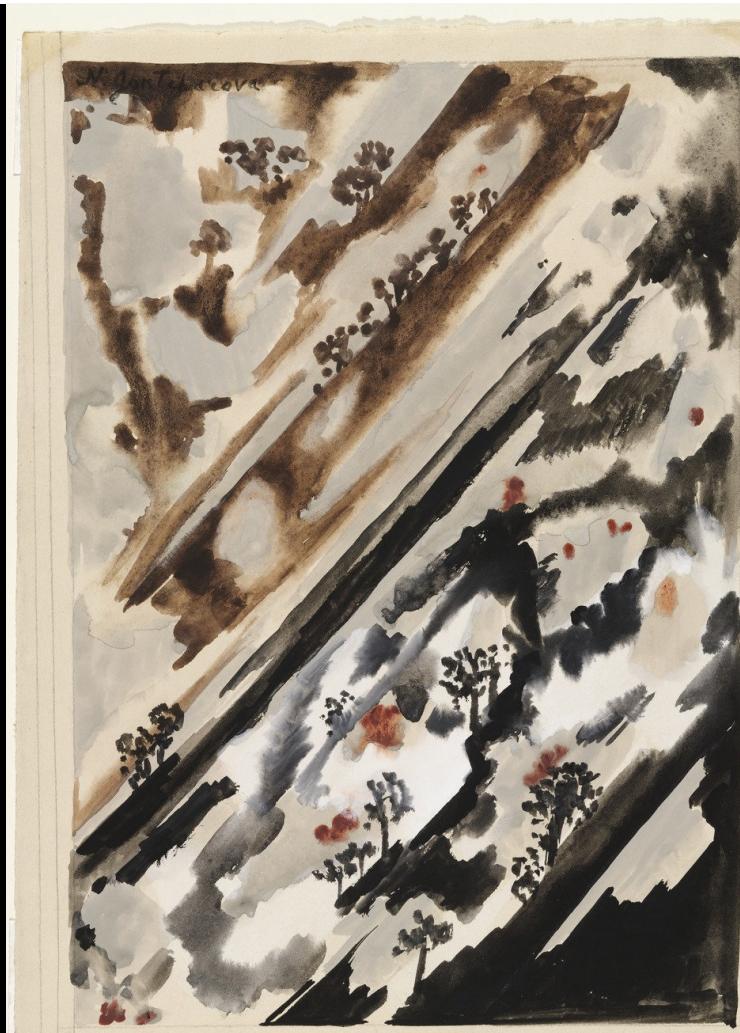
WEEKS

MONTHS

YEARS

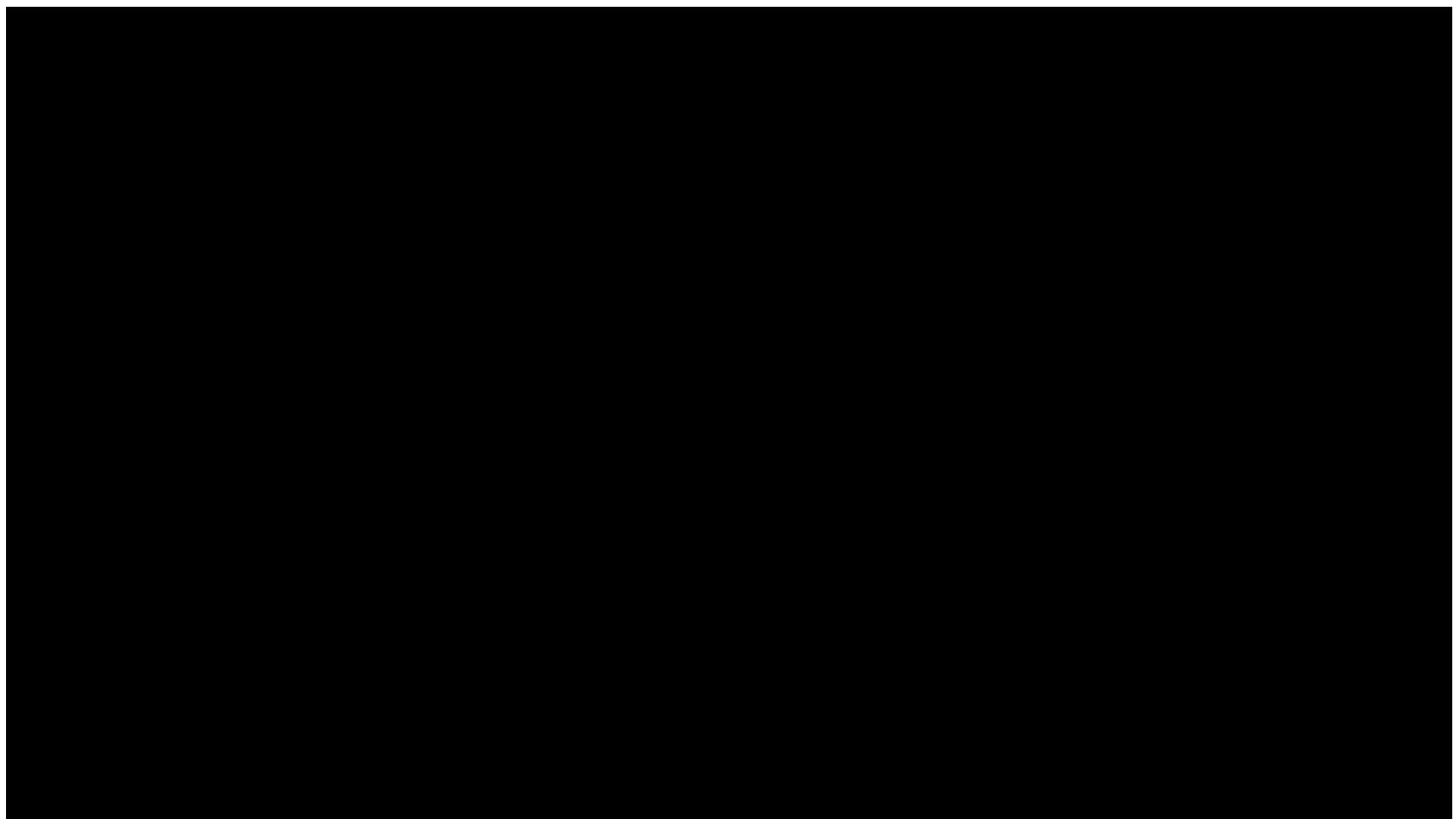
orientation

various orientations, ranging from the vertical
to the horizontal in a distinct direction



William Trost Richardson





uncertainty

<u>visual variable</u>	<u>mean</u>
placement	2.98
shape	2.92
texture/blur	1.98
value	1.97
orientation	1.68
size	0.99
color	0.42

The figure displays a Google search results page for "graphs of uncertainty". The search bar shows the query. Below it, the "Images" tab is selected. A grid of 15 images illustrates various types of graphs showing uncertainty, such as error bars, shaded regions, and probability distributions.

Key images include:

- Figure 1: A graph of Quantity A vs. Quantity B with error bars and three gradient lines (best, steepest, shallowest).
- Figure 2: A graph of Distance vs. Time with three gradient lines (best, steepest, shallowest).
- Figure 3: A graph of Current (ampere) vs. Electric Potential (volt) with error bars and three gradient lines (best, steepest, shallowest).
- Figure 4: A graph of Current (ampere) vs. Electric Potential (volt) with error bars and three gradient lines (best, steepest, shallowest).
- Figure 5: A graph of Current (ampere) vs. Electric Potential (volt) with error bars and three gradient lines (best, steepest, shallowest).
- Figure 6: A graph of Number of model results vs. Climate variable (e.g., Temperature) showing a bell-shaped curve with shaded regions representing uncertainty levels (10%, 30%, 90%).
- Figure 7: A graph of Motion of a cart along the floor showing position vs. time with three gradient lines (best, steepest, shallowest).
- Figure 8: A graph of Uncertainty in Projections of Real GDP (Billions of 2005 dollars) from 2005 to 2010, showing a fluctuating trend with a shaded uncertainty band.
- Figure 9: A graph of Position vs. Velocity with error bars and three gradient lines (best, steepest, shallowest).
- Figure 10: A graph of Position vs. Velocity with error bars and three gradient lines (best, steepest, shallowest).
- Figure 11: A graph of Position vs. Velocity with error bars and three gradient lines (best, steepest, shallowest).
- Figure 12: A graph of Position vs. Velocity with error bars and three gradient lines (best, steepest, shallowest).
- Figure 13: A graph of Position vs. Velocity with error bars and three gradient lines (best, steepest, shallowest).
- Figure 14: A graph of Position vs. Velocity with error bars and three gradient lines (best, steepest, shallowest).
- Figure 15: A graph of Position vs. Velocity with error bars and three gradient lines (best, steepest, shallowest).

The profound challenge we face is to accept the ambiguity of knowledge, the fundamentally interpreted condition on which data is constructed.

Drucker, 2014

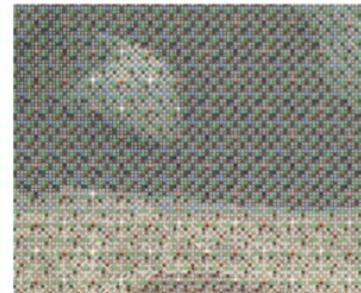
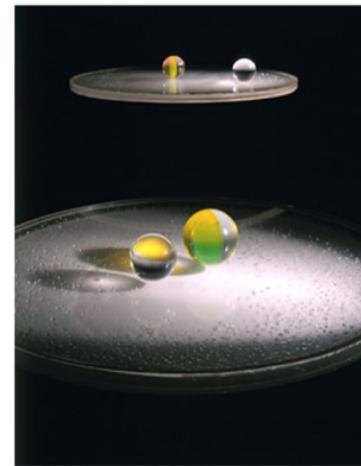
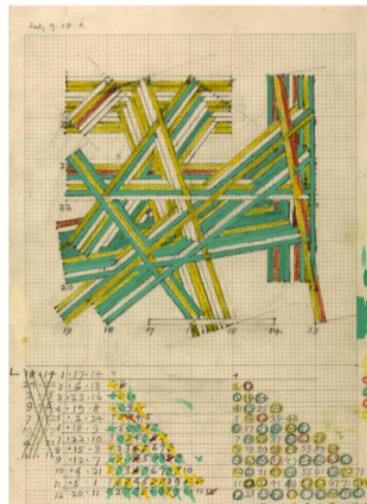
[VIEW ALL](#)

45 images of **point** expressed through **color** with **maximum** results
0 images of **area** expressed through **texture** with **specific** results

- signifiers
 - point
 - line
 - area

- variables
 - shape
 - color
 - orientation
 - texture
 - value
 - size
 - position

- range
 - specific
 - maximum



Clare Churchouse:
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Aaron Hill:
aaron.hill@newschool.edu

Download these slides at:
<http://aaronhill.nyc/aapor.pdf>

References

- Bertin, J., & Berg, W. J. (2010). *Semiology of graphics: diagrams, networks, maps* (1st ed). Redlands, Calif: ESRI Press: Distributed by Ingram Publisher Services.
- Drucker, J. (2014). *Graphesis: visual forms of knowledge production*. Cambridge, Massachusetts: Harvard University Press.

citations

Mira Schendel. Perforated V (Perfurados V). c.1970s. Perforated paper. 32 x 32 cm. Museum of Modern Art.

Jill Baroff. Blackbird. 1997. Graphite on cut-and-pasted Japanese paper on paper. 50 x 72 cm. Museum of Modern Art.

Kiripi Katembo, Subir, Un regard, 2011. photo, Lightjet print. 60 x 90 cm. Contemporary And Magazine.

Bruce Connor. Bombhead. 2002. Digital print with acrylic paint additions. 81 x 64. Museum of Modern Art.

Fernanda Gomes. Untitled. 2009. Wood and painting. 30 x 30 x 5 cm. Galerie Emmanuel Hervé.

Salvador Dalí. The Persistence of Memory. 1931. Oil on canvas. 24 x 33 cm. Museum of Modern Art.

Cornelia Parker. Cold Dark Matter: An Exploded View. 1991. Wood, metal, plastic, ceramic, paper, textile and wire. 400 x 500 x 500 cm. Tate.

Cai Guo-Qiang. Drawing for Transient Rainbow. 2003. Gunpowder on two sheets of paper. 455 x 405 cm. Museum of Modern Art.

Frédéric Benrath. Untitled. 1956. Lithograph on paper. 43 x 29 cm. Tate.

Glenn Ligon. Study for Black Like Me. #2. 1992. Oilstick on paper. 81 x 38 cm. Museum of Modern Art.

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Jeff Elrod. Green Echo. 2013. Digital print. 70 x 57 cm. Museum of Modern Art.

Gerhard Richter. Abstract Painting (726). 1990. Oil paint on canvas. 251 x 351 x 4 cm. Tate.

Uta Barth. Field #20. 1997. Digital print with acrylic paint on canvas. 346 x 416 cm. Tate.

James Turrell. Frontal Passage. 1994. Light. 392 x 686 x 1036 cm. Museum of Modern Art.

Luigi Veronesi. Photo n.152. 1940, printed 1970s. Photograph, gelatin silver print on paper. 32 x 30cm. Tate.

Lee Ufan. From Line. 1978. Oil paint and glue on canvas. 182 x 228 cm. Tate.

Anish Kapoor. Untitled. 2003. Pastel on paper. 55 x 75 cm. Museum of Modern Art.

Odilon Redon. Apparition in the Window. c.1892. Charcoal and chalk on paper. 46 x 31 cm. Museum of Modern Art.

Catherine Yass. Stage. 1997. Screenprint on paper. 89 x 74 cm. Tate.

Ed Ruscha. Untitled. 2015. Acrylic on canvas. 183 x 315 cm. Gagosian.

Natalia Goncharova. Composition. 1920. Watercolor on paper. 28 x 20 cm. Museum of Modern Art.

Monika Sosnowska. The Tired Room. 2005. Painted mdf. Installation view, Freud Museum, Vienna, Austria. Capitain Petzel.

links

Mira Schendel. Perforated V (Perfurados V). <https://www.moma.org/collection/works/94752> accessed 5/17/18.

Jill Baroff. Blackbird. <https://www.moma.org/collection/works/37447> accessed 5/17/18.

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Fernanda Gomes. Untitled. <http://emmanuelherve.com/en/artistes/oeuvres/8/fernanda-gomes> [16] accessed 5/17/18.

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Catherine Yass. Stage. <http://www.tate.org.uk/art/artworks/yass-stage-p78088> accessed 5/17/18.

Ed Ruscha. Untitled. <https://www.gagosian.com/artists/ed-ruscha/selected-works> accessed 5/17/18.

Natalia Goncharova. Composition. <https://www.moma.org/collection/works/33825> accessed 5/17/18.

Monika Sosnowska. The Tired Room. <http://www.capitainpetzel.de/artists/sosnowska-monika/> accessed 5/17/18.