Entity to Event: From Literal, Mechanistic Materiality to Probabilistic Materiality

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Materiality is a word now much in vogue. A term bearing all kinds of implication and suggestion, it is enjoying its current popularity as if it were a notion born yesterday to fulfill the appetite of pixel-plagued bit-weary early millennial writers who have discovered a taste for 'stuff' – the *matter* of the *real* put into opposition (wrongly, I believe) with the *immateriality* they attribute to the *virtual*.[1] Myths upon myths, these concepts build on oppositions and binaries that come to us out of classical philosophy as well as the prohibitions that the Abramic religions institutionalized within their teachings – so that the pure and the impure, clean and dirty, virtuous and vice-ridden map their hard orthodoxy onto the distinction of matter as always aligned with the earthly, the physical, and most tainted of all, the realm of the senses, the body – the flesh.

All this is ancient history, overturned of course in the writings of feminists and queer theorists, in the revival of affection for Lucretius, the resurfacing of phenomenology after its long banishment from the structuralist court, and the recent enthusiasm for various formalisms in critical theory or aesthetics.[2] Right?

Perhaps. The attempt to theorize materiality remains locked into a peculiar straight-jacketedliteralism, I suggest, characterized by gestures towards and rhetoricabouttheneedtoengage with matter, but little actual skill in the undertaking.Inventories,lists,descriptivepassages, the analysis of–what? Languageandmeter,prosodyandcomposition,writing technique are on displayagainasifnoticingtheformofexpressionwerearare novelty rather than thebaselinestartpointforanyinterpretationitshouldbe.Sometimes a bit of descriptivebibliographicalinformationevenappearsinrareandmore ambitious casesamongthosewillingtodipintothearchivesinaccessibleattheirdesktops and requiringstill,intheselazydays,avisittothespecialcollectionsroomand its rusty treasures.Materialityintheeagertermsofitsnewdevoteesconsists largely of a languageofthickdescription,attentiontophysicaldetailsand identification of themanufactureofpaper,styleoftype,orcostofbinding.[3] All this characterizationispressedintoanindexical taxonomy through which these materialcluestrackintotherichfield of conditions of social production and historicaltraditions.Allthisis good, as far as it goes, and much to be preferred tothealternative—thehabit of ignoring material instantiation of text or imageasifitwere an act of intellectual immodesty to look at the way works arecomposed and made. The celebration of *transparency*, in which physicality

The first gestalt principle, emergence, or putting together, shows the need to differentiate figure and ground, see the coherent pattern among stimuli, make the first decisions about what belongs with what. Such cues as we rely on now, not always a feature of textual practice. Time was when no word space was used and none seemed to be required. But we can't navigate without it any more, lost in the thicket of those lines of text.

and materiality are wished away, is a pernicious practice rooted in the worst sort of denial or denigration of our embodied condition.

But if that descriptive literalism is what is usually meant by materiality among the current acolytes to its cause, then how might the idea be expanded in a dialogue with received traditions and a theoretical grounding in probabilistic rather than mechanistic approaches to the practice of interpretation?

Did we make a huge leap in that last sentence? Were we walking on a measurable road, finding our way among familiar milestones and landmarks, when suddenly a chasm appeared in the rhetorical path as fantastic as any gaping canyon in a tale from Narnia or the dimension-bending universes of science fiction's parallel worlds and alternate realities? Go back and look and see what radical sleight of mind is performed by the conjunction and the phrase that modifies the term 'grounding' in that sentence – even as the very earth beneath our intellectual feet appears to give way.

Reification, the second gestalt principle, refers to the tendency to group things by implication, to fill in what is not there. If this were not such a complicated paragraph, more would be left out – words and connectors. That will occur later. Here, the usual spatial continuity is disrupted, giving the eye a bit of gymnastic activity. Bad line breaks, anti-poietic.

Probabilistic materiality conceives of a text as an event, rather than an entity. The event is the entire system of reader, aesthetic object and interpretation – but in that set of relations, the 'text' is constituted anew each time.[4] Like weather produced in a system around a landmass, the shape of the reading has a codependent relation to the structure from which it arises. Probability is not free play. It is constrained play, with outcomes calculable in accord with the complexity of the system and range of variable factors, and their combinatoric and transformative relations over time. A text is a highly complex system, containing a host of thermal sinks and basics of attraction.[5]

All of this sounds heady. Unfamiliar. Our imagination reaches almost to embrace these ideas – and then hesitates, unsure how to translate them back into a relation with real things, objects, texts on a page, books, typography, images and illustrations.

Backtrack into the literal concept of materiality and imagine a reading of this page that examines all its elements in some enumerated list of entities. Header, page number, text body and – ? White space. Think again, the spaces on the page are not entities, intact elements that can be lifted out of the page like things.[6] The dimensions of the margin create a field that has a certain weight, heft, as the gap between the page header and top line of the text has a vectorial force, distinguishing one element from another in a textual system. Likewise, a paragraph indent serves a signaling function that only has value because it is within a conditional whole, and the openings in counters of letters, their distinction from each other, word breaks and line endings – devices and

conventions on which we depend. They each do work, act, have a behavioral function in relation to their presence on the page. Not things, not entities, these white spaces are a field of forces in dynamic tension.

Conce(i)(p)ts of materiality h(e)ave a long/e history in poetics and aesthetics, and in the legacy of Plato and Aristotle as in(ef)fluences (i)on Hellenistic and Christian th(dr)ought. Or, we can begin earlier, with Thales, a pre-Socratiç whose late 7th and early 6th century BCE though(t), as characterized by Aristotle, was concerned with the n(m)ature of ma(u)tter as the principle of all th(s)ings. @ttention to the prop(e)r(ie)ties of the p(h)ysical and natural world w(e)ave®s through the Greek philo$ophical tradition. Plato was committed to a hierarchy in which idea made into manifest form was already debased, but when rendered as artistic representation fell even further from truth, gave voice to a theory of atomistic meaning rooted in material when he let Socrates speak in the *Cratylus*.[7] The debate in that dialogue between natural and conventional signs, the idea that letters might by their shape or sound communicate their meaning directly, was a material theory of media. Socrates compares the letters to colors, and suggests they may be applied in a similar way to form mimetic expressions. Serious or not, Plato's essay has been a touchstone for theories of sound symbolism ever since, and the long history of mimetic belief, grounded in a theory of natural signs, forms one side of an argument in which conventionalists present an alternative position.[8] But convention and belief in the materiality of signification are not irreconcilable. Even if the value of materials resides in their place in social systems, rather than being inherent in their physical properties, the integral of matter and expression can be (necessarily must be) theoretically sustained.

In his *Poetics*, Aristotle lists *means*, *objects* and *modes* as the basis on which the genres of tragedy and comedy may be distinguished. His poetic means include language, harmony and rhythm – the *elements* of language – while his attention to voice – performance and influence – and to the *character* of language, engages him directly with materiality.

Early Christian thinkers, synthesizing Platonic thought and Church doctrine, created semiotic theories that were the beginnings of a study of language. Clement of Alexandria, in the *Stromates*, outlined a four-part analysis of Egyptian letters as the scheme on which interpretation of symbols could be based (hieroglyphic, curiological, allegorical and symbolic).[9] The system depended upon careful attention to the features of the visible signs, their material expression and organization. The mythic force of figural and allegorical images resonates with other features of medieval belief. Clement's system remained a basis for interpretation of signs well into the late Renaissance.

Augustine *A* A A A⁺ Augustine, developing his own theory of signs as a basis for religious belief and teaching, considered all visible appearances to be merely means for learning about realities, dispensable once true knowledge was obtained.[10] But his intellectual inquiries

led him to careful distinctions between saying and meaning that opened the door to analysis of sound outside of sense, a material expression that had to exist in order for meaning to arise. He may well have taken this idea from Plotinus, the neo-Platonist, who described speech as 'a disturbance set up by the voice in the surrounding air'.[11] But recognition of materiality of expression registered in his thought and practice.

Aristotle divided the world of substance into
matter and form – the stuff things are
made of and the patterns
or shapes they assume or are given.
The philosopher aligned each with
gendered attributes, matter, material,
with mater, the mother, and form with
the paternal or masculine. These categories
passed into western legacy by way of
those great translators and exhaustive compilers.

The third century neo-Platonic philosopher, Porphyry, composed introductions to logic and Aristotle's *Categories* that attempted to harmonize the natural philosopher's method of beginning with particulars to the Plato's attachment to the realm of ideas. In the sixth century, Boethius passed these lessons from antiquity forward, as part of his endeavor to render the entire Greek corpus into Latin and preserve a crucial part of the Greek cultural legacy during the centuries in the West after the Roman Empire dissolved in the late fifth century and Europe did not exist except as a landmass invaded by Goths and Visigoths, Vikings and other raiders. During these centuries, Islamic culture rose in the East, along with the power of the Byzantine empire, and at the courts of enlightened Caliphs, natural philosophy and Greek intellectual traditions were preserved and expanded, in mathematics, medicine, astronomy and other disciplines. Beyond the horizon of western culture, in India and China, approaches to matter and/as energy took different forms, but these came late to the western theatre of operations in which our discussion of materiality takes place.

Aristotle's distinction between matter and form was passed on through Isidore of Seville's *Etymologies*, the masterly seventh century lexical compendium, which became the basic reference text and model for all subsequent medieval encyclopedias. The *Etymologies* continued to transmit their preserved portions of classical thought into the early age of print, as many editions of the work were issued in the late fifteenth century, after which the text fell out of favour. His definitions of matter and *materia* are central concepts in the role of materiality in Christian practice, particularly in the later middle ages when the cult of relics and age of miracles arrived. Manifestations in physical form supported strange occurrences up close and mysterious influences at a distance because matter was the accidental individual appearance of that divine essence that was everywhere.[12]

Among the other ancients we can also point to Cicero as a figure of influence throughout the middle ages.[13] His role in the imagery of material

means of communication is connected to his concept of memory as inscription on a wax tablet. This became one of the central figures of mnemonic device in the middle ages. The images is both allegorical and literal, a way of describing memory as a process and an actual description of its operation according to material features of wax and stylus, imprinting and then slow blurring, of those inscribed lines.

Theories off media are trumped inch the late medieval period and early Renaissance bye treatises one technique. Explicit theoretical reflection, though everywhere implied in the study of pigments and effects, can only be teased out off the treatises one technique authored bye Leonardo, Cennini, Alberti and others.[14] The early industrial age off print witnessed a passion fore manuals, such as those inch typography and book production, exemplified inch an era opened by Geoffrey Tory's *Champfleury* inch 1529, or finding its early *summa* inch Joseph Moxon's *Mechanik Exercises*, 1694. But though each exhibits inch its rhetoric an engagement with material means, the idea off theorizing materiality and media explicitly must await a later moment and more modern sensibility.

Closure is the principle of finishing what is present by filling in according to expectation or habit or most familiar outcome. We see and read what we expect to see and read or what seems to be most likely. Prepositions, these critical pivots, are of course the ones to erase from view.

Attention shifts away from technical matters to sensibility and taste in the eighteenth century writings of Alexander Baumgarten, which make attention to media and matter integral to aesthetics.[15] At the moment that Baumgarten inaugurated the new field of aesthetics and Johan Winckelmann laid the groundwork for modern art history, the play of materiality as the foundations of taste and connoisseurship began to come into view. Though Immanuel Kant's forceful *Third Critique* rejected any notion that aesthetic value was inherent in objects, positing instead that judgment was a property that connected practical and pure reason through the sensible, even his rejection of a formalist premise for assessing aesthetic value could not erase the need for judgment to arise in some crucial way from material and its effects. If, as Aristotle stated, form is what allows sense to appear to sentience, then matter is the instrument and vehicle through which sensibility attends to those provocations we term aesthetic.

Theories of materiality came to the fore in the nineteenth century. Baudelaire's 1859 *Corréspondances*, 'which sing the ecstasies of the mind and the senses', became a touchstone for Symbolist aesthetics.[16] Close in time, Gotthold Lessing's 1853 'Laocoon: Essay on the Limitations of Painting and Poetry' insists on the distinction among the material properties of artistic modes, emphatically engaging with material practice as the foundation of artistic activity.[17] Sculpture is not painting, volume is not illusion, and the properties of each medium belong to its proper sphere of expertise and production. And yet, on a higher level, the symbolists transcend their material excesses by imagining a synaesthetic world of vibrations and equivalent harmonies.

Modern art and its theorists abounded with references to materiality.[18] The attention to matter, media and the particularity of the arts is one of the points on which art becomes modern. The specificity of media as an essential feature of the arts, is a central argument of Clement Greenberg's

'The New Laocoon'.[19] Greenberg's mid-twentieth century insistence on the flatness of the canvas, extending the early twentieth century attention to paint, brushstroke, pigment and daub as the first and most essential aspect of any composition – these are well-known and much attended to tenets of modern art.[20]

In addition, we may can return to Wassily Kandinsky's *Point and Line to Plane*, to the Symbolists over-worked surfaces, Gustave Moreau's shimmering jewel-encrusted Salomé, to see the ways material means come into their own in the production of an aesthetic of experience.[21] We can note the neo-plasticism of Piet Mondrian, imagined ideographic directness of Ezra Pound's imagist appropriation of the Chinese character, Tristan Tzara's dictum 'meaning is made in the mouth', and Pablo Picasso comparing the self-evident identity of a painting to that of a child stating 'you do not represent a baby, you present it' as if the analogy completed an argument about autonomy that required no further support.[22] These and many other assertions formed the basis of modern autonomy and its insistence on materiality as the foundation of that position.

We may look to Velimir Khlebnikov and Alexsei KrutZhenyk's great Zlaims in 'The Word as SuZh', and 'The Letter as SuZh', to the writings of MauriZe Denis, for other expliZit examples, as well as the Prague SZhool semiotiZians, suZh as Jan Mukarovsky for elaborations of materiality as a signifying prinZiple.[23] No shortage of suZh Zitations exist, quite the Zontrary, they are everywhere in the aesthetiZ writings of late nineteenth and early twentieth Zentury aesthetiZs, as well. Konrad Fiedler and his student Adolf von Hildebrand espoused theories of 'plastiZ' form that were rooted in essentialist notions of materiality. The ZonZept of self-evident visual means, or of formalist teZhnique, was a reZurrent theme in the 1920s and 1930s. Pavel Medvedev and Mikhail Bakhtin, in 1928, 'The symbolist word neither represents nor expresses. It signifies. Unlike representation and expression, whiZh turn the word into a Zonventional signal for something external to itself, this "signifiZation" preserves the ZonZrete material fullness of the word [...]'.[24] And if we wish to revisit the formalist position, we have only to read the words of Z.K. Ogden and I.A. RiZhards: 'Every medium has as a material its own partiZular effeZt upon our impulses. Thus our feelings towards Zlay and iron, towards the organ and the piano, towards Zolloquial and Zeremonial speeZh, are entirely different'.[25]

<div style="margin-note">Similarity is the principle of associating like things with like, whether they belong together or not. Ze effect can be remarkably Ztrange.</div>

We can (and I have) scoured the writings of late nineteenth through twentieth century artists for support of the premise that attention to literal materiality is a premise on which art practice and its critical and philosophical understanding must be based. Everywhere in the writings of Albert Gleizes, Jean Metzinger, Picasso, Paul Klee, Theo von Doesburg and the various communities of Russian formalists and the Prague school, we see attention to the material foundations of aesthetic expression explicitly addressed.[26] Among the formalists, and their Prague followers, a dialectical approach to materiality comes into view. In the work of Mikhail Bakhtin and Pavel Medvedev, Jan Mukarovsky and Yuri Lotman, we glimpse the recognition that material has value within a set of social conditions and

systems, antithetical and synthetic relations.[27] Inherent properties, attention to faktura, material facts, are essential, but not sufficient as a way to understand the values of aesthetic artifacts whose reading must be situated within social and cultural semiotic systems. In that world, materiality becomes enlivened by a recognition of the need to combine literal materiality with a dialectical approach.

But whereas the 'language of form' – a phrase and attitude that are prevalent throughout the twentieth century until the conceptual turn of the 1960s – proposed a systematic formalism, one in which a set of universal principles, it was imagined, might be articulated as guides to interpretation as well as composition, we, now, I think, must qualify and refine, expand and extend, this formalism through the many lenses of historical, cultural, ideological and cognitive approaches to materiality. And in addition, make the leap suggested earlier to go beyond the limitations of literal and dialectical materiality, based in a notion of discrete physical entities or structuralist systems, towards a probabilistic approach.

Now we must arrive at the realization that our very apperception, guided as it may be by habits that can be characterized and predicted to some extent by gestalt methods, are subject to conditions of behavior, disposition and use. Enter the probabilistic.

A probabilistic reading suggests that any text or image (or other aesthetic object – church, theater production, musical piece) is performed when it is read, looked at, experienced.[28] The aesthetic object presents a set of constraints and possibilities – it can be read a certain number of ways, gives rise to a set of possible interpretations. These cluster, as in any other statistically measured human experience, around a norm, with an error distribution. Outliers will occur. The performance of the work constitutes it, but also, has an effect on the cognitive experience of the reader/viewer. Working with a radical constructivist (rather than representational) notion of cognition, we know that experience is neurologically based.[29] Trauma studies show, through the extreme case, that a physiological transformation occurs as the result of experience. Stimuli transform our capacities for perception, as surely as our predisposition to perceive selectively transforms the objects in our view. We do not *see* them, we have a neuronal response to the stimulation they provide.[30]

Symmetry is the principle of preference for bilateral balance. This only distorts our text sightly, or slightly, but could be pushed to any and many an extreme, as per George Herbert's many angels and urns.

The aesthetic object offers its possibilities, not as a thing or entity, but as a provocation to interpretation. Thus we have to understand texts, images, etc. as *events*, not *entities*. In their literal and physical construction, they express conditions and a field of forces, not a set of things in relation to each other whose identities are fixed or self-evident.[31] Nor are the 'things' of a text self-identical.[32] They are always probabilistic entities, subject to constrained but indeterminate possibilities. As in any probabilistic field, the act of intervention (reading, seeing, watching) constitutes the event, gives it determinate form from its potential.

With such concepts in mind, we see the page, book, print, or screen space of text and image quite differently from the usual static presentation of thing, and see it instead as an active, dynamic field of forces and energies in dynamic suspension, acting on each other and within a frame of constraint, to produce the conditions a reader is provoked by in the constitutive act of reading that makes the text. Again I come back to the central premise that a text, work of art, aesthetic expression is an *event* not an *entity*. The material existence serves as a provocation, set of clues and cues for a performance of the text.

In the framework of perceptual and cognitive approaches to the act of reading

Continuity is that principle of imaging that an appearance of action or dynamic movement will probably continue, unless there is reason for it to cease. or viewing, we can draw on gestalt theory in the visual realm for insight into the ways such probabilistic concepts emerge from literal understandings. For the laws of gestalt are all specific analyses of physical/visual properties of graphical forms but they only describe the possibilities and likelihood of what will be produced in the act of viewing or reading.[33] All of the gestalt principles depend

upon a performative act, rather than suggesting that the image 'is' an entity constituted by its formal arrangement of elements. The image is a potential field for meaning production. It its produced, constituted, created through an act of viewing in accord with the 'laws' of gestalt (which are really laws of probability that predict likely outcomes). An image, text, film, movie, any aesthetic artifact will have a tendency to be read one way rather than another across a probability distribution. A certain percentage of persons will read a sentence or image in a particular way, and the error ratio can also be mapped statistically around the features that serve as basins of attraction, sites or node of attention, to varying degrees. Those gestalt principles are: emergence (putting together coherence from stimuli), reificiation (filling in, generating a coherent whole from implication or suggestion), multistability (ambiguity in play), invariance (some things stay the same no matter what the size, scale, location) and pragnanz or conciseness (the tendency to put things into order as much as possible, proximity, closure, similarity, symmetry, continuity).

These principles are always working in the graphical field, they are what makes a text block cohere, a paragraph indent read as a break and word groupings and line continuity seem to be natural phenomena. They are not natural of course, and the conventions that govern the organization of page space are those of long tradition. The emergence of the modern scholarly book from the undifferentiated pages of classical and medieval manuscripts gave rise to the graphical structures we depend on for the functional operation of book and page space.[34] By intervening more radically than usual in those conventions, my intention has been to demonstrate the ways the principles of graphic order – when disrupted – are immediately called to our attention. Graphic principles are not rules governing a mechanistic, static, order and organization. They are not simply guidelines for the creation of display. They are principles for structuring possible behaviors, functional cues to use across a probabilistic curve. What has been disrupted here is not the literal organization of the page, but the way the graphical organization of a probabilistic field gives rise to certain outcomes over others.

In conclusion, I invoke aesthetics in order to suggest that the force of materiality supports provocations to knowing. Art is the practice of form-giving, aesthetics the field of philosophy concerned with knowledge that arises from perception. So if the task of art is form-giving, and form-giving is the expression of knowledge, then the possibility of envisioning reinvention of our understanding of our own processes relies upon a recognition that they are indeed at work. The sensible page is only the appearance of a provocation to perception – it is not a literal template transferred to the mind.

No exhaustive description, however thick, of the type, page, paper, print,
style, conventions, mode and matter of this production will be sufficient
to guarantee that it is read the same way twice. By definition, it can't be.
Aesthetic expressions do not exist in a condition of self-identity any
more than other objects. Look and think, be provoked, into a
reading and response, a creation of the text, page, image,
as an event. The cognitive mind, unaccustomed,
reprograms, running its synaptic patterns
through a habitual response it finds
inadequate to the new task,
so new tracks and trails
are scribed
and inscribed, made to fashion a world
of concept anew in the autopoetic mind. There, where the world is what we
perceive it to be (paraphrasing Heinz von Foerster), the force of aesthetic
propositions has its way, making it possible to imagine the world as it is, has
been, may be.[35] Form is idea, but not in fixed form. The cognitive process
is p e r f o r m a t i v e, not procedural, probabilistic, not mechanistic. Texts,
images, experiences are not entities but e

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Notes

[1] 'The materiality of the signifier' was the mantra of my graduate school mentor whom I first encountered in 1980. He celebrated the modernist interest in formalism and its attention to device, even as he pulled us into the world of structuralist systems. His heroes were Dziga Vertov and the Ferdinand de Saussure of the *Anagrams*, Sigmund Freud of the dream-work and other formalist structur-alists who turned their interest in matter into method. Under his tutelage we read Roland Barthes, Tvetzan Todorov and many classic semiotic texts. By insisting on the relational quality of semiotic systems while calling our attention to the deep shadows and silvery light of the nitrate prints we were still privileged enough to sometimes watch at the Pacific Film Archive, he alternatively exhorted and seduced us into a belief in the necessity of paying attention to the work of aesthetic artifacts as the very premise on which other interpretative activity could proceed. Prob-ability was not in the mix in those days. But I am referring to the current vogue, such as N. Katherine Hayles, *Writing Machines* (Cambridge, MA: The MIT Press, 2002), or the discussion in Marjorie Levinson's 'What Is New Formalism', *PMLA*, 122:2 (March 2007), pp.558-69, or Hans Gumbrecht, *The Production of Presence: What Meaning Cannot Convey* (Stanford: Stanford University Press, 2004).

2 For a good treatment of materiality, even if focused on relatively recent discussions, see Matthew Kirschenbaum, *Mechanisms: New Media and the Forensic Imagination* (Cambridge, MA: The MIT Press, 2008). The discussion of forensic and formal materiality is particularly valuable as a way to distinguish analysis of physical aspects and meaning-production features.

3 Textual scholarship informed by bibliographical studies is rare under the dominance of cultural studies, but the tradition persists among those most excellent and expert practitioners: Anthony Grafton, Eveyln Tribble, Elizabeth Lyman, Jerome McGann, William Sherman, Stuart Sillars, Randall McLeod, Steve McCaffery and the late Douglas McKenzie, to name just a handful of outstanding figures.

4 As a science, probability arose from games of chance, Pascal and Fermat, in 1654, were drafted by a nobleman who found himself losing more than he wished to at the gambling table. Why, he wondered, were his own calculations of outcomes so mistaken? Probability and statistics arise in the same era, at the beginning of the long eighteenth century that inaugurates our modern world and its attempts at empirical understanding of all and every aspect of the natural universe. Probability lays the groundwork for the administrative computations of human and social phenomena, for the universe of 'political arithmetic' articulated by the aptly named William Petty and his precursor, William Graunt. Probability was originally intended as a way to calculate the odds, control an apparently uncontrollable outcome, make chance the servant of decision and strategy. Among its followers, the frequentists, so termed for their addiction to figuring how much out of how often and other numerically measured factors. Statistics arises as a set of laws of error, means, averages. Pierre Simon Laplace, passionate inventor of the error function, Francis Galton, the regression to the mean, tendency of extremes and outliers to move back towards the science so social physics, discovered by the Frenchman L.A.J. Quetelet's, and the work of the brilliant Fourier, who predicted that heat energy neatly compressed into a single source would distribute itself in perfect performance of a distribution of error curve if left undisturbed as it dissipated. The statistician's alchemical arts, turning the dross of real behavior and commerce, mortality tables and actuarial computations into the gold of predictable outcomes serves as a mainstay of the modern state (the term *status* from which each word

derives is only the start point of their common cause). See T.M. Porter, *The Rise of Statistical Thinking* (Princeton: Princeton University Press, 1986).

5 I'm referring here to complex systems theory, which emerged from chaos theory, and the work of Edward Lorenz, *The Essence of Chaos* (Seattle: University of Washington Press, 1996).

6 See my essay on the white space in a page of William Morris's Chaucer, in 'Visual Performance of the Poetic Text', in *Close Listening*, ed. Charles Bernstein (Oxford: Oxford University Press, 1998), pp.131-61 and also in a more developed form in 'Graphical Readings and the Visual Aesthetics of Textuality', *Text*, 16 (2006), pp.267-76.

7 Cratylus, translated by Benjamin Jowett, <http://classics.mit.edu/Plato/cratylus.1b.txt > [10/05/2009].

8 Gerard Genette, *Mimologiques* (Paris: Seuil, 1976).

9 Clement of Alexandria, *Stromates*, *Chapter IV*, *Divine Things Wrapped up*, in Figures, <http://www.ccel.org/ccel/schaff/anf02.vi.iv.v.iv.html > [10/05/2009].

10 R. A. Markus, 'St. Augustine on Signs', *Phronesis*, 2:1 (1957), pp.60-83. For a detailed discussion of the intellectual background from antiquity in the Hellenistic thought from which Augustine's concept of signs is drawn, <http://philpapers.org/rec/MARSAO> [10/05/2009].

11 R.A. Markus, 'St. Augustine on Signs', p.65.

12 Caroline Bynum, Lectures on Christian materiality, given at the Stanford Humanities Center in March, 2009.

13 Mary Carruthers, *The Craft of Thought* (Cambridge: Cambridge University Press, 2000) and *The Book of Memory* (Cambridge: Cambridge University Press, 1990).

14 Mary Philadelphia Merrified, *Medieval and Renaissance Treatises on the Arts of Painting* (London: John Murray, 1849), consisted of her translations of texts from the twentieth century through the eighteenth century.

15 Monroe Beardsley, *Aesthetics* (Tuscaloosa: University of Alabama Press, 1975).

16 A.G. Lehmann, *The Symbolist Aesthetic in France* (Oxford: Basil Blackwell, 1950).

17 Gotthold Lessing, *Laocöon. An Essay upon the Limits of Painting and Poetry: With Remarks illustrative of Various Points in the History of Ancient Art*, trans. Ellen Frothingham (Boston: Little, Brown, 1904).

18 Michel Seuphor, *Abstract Painting* (New York: Dell, 1964).

[19] Clement Greenberg, 'Towards a Newer Laocöon', *Partisan Review*, 1940.

[20] Francis Frascina, *Pollock and After* (New York: Harper and Row, 1985) and Johanna Drucker, *Theorizing Modernism* (New York: Columbia University Press, 1994).

[21] Wassily Kandinsky, *Point and Line to Plain* (New York: Guggenheim Foundation, 1947).

[22] Johanna Drucker, 'Visual and Literary Materiality in Modern Art', in *The Visible Word* (Chicago: The University of Chicago Press, 1994), pp.49-90. Also, Ezra Pound, 'From the Manuscripts of Ernest Fenellosa', <http://infomotions.com/etexts/gutenberg/dirs/etext05/7cnpj10.htm> [10/05/2009].

[23] Anna Lawton and Herb Eagle, *Russian Futurism Through its Manifestos* (Ithaca: Cornell University Press, 1988) and Maurice Denis, 'Remember that a painting – before it is a battle horse, a nude model, or some anecdote – is essentially a flat surface covered with colours assembled in a certain order', in *Semiotics of Art: Prague School Contributions*, eds Ladislav Matejka and Irwin R. Titunik (Cambridge, MA: The MIT Press, 1976).

[24] Pavel Medvedev and Mikhail Bakhtin, *The Formal Method in Literary Scholarship*, (Cambridge, MA: Harvard University Press, 1987), p.57.

[25] C.K. Ogden, I.A. Richards, J. Wood, *Foundations of Aesthetics* (New York: Lear Publishers, 1925), p.28.

[26] Herschel B. Chipp, *Theories of Modern: A Source Book* (Berkeley: University of California Press, 1984).

[27] Victor Erlich, *Russian Formalism* (New York and The Hague: Mouton, 1980).

[28] Paraphrasing Mary Carruthers here.

[29] Ernst von Glasersfeld, *Radical Constructivism: a Way of Knowing and Learning* (London: Falmer Press, 1995).

[30] Humberto Maturana and Francisco Varela, *The Tree of Knowledge: The Biological Roots of Cognition* (Boston: Shambala, 1987).

[31] My former colleague, Jerome McGann, came up with this analogy of page and text as a wave function that collapses when he was reading Heisenberg in our SpecLab days.

[32] Similarly, the concept of non self-identity from George Spencer Brown's *Laws of Form*, came to me through the readings of Jerome McGann.

[33] Gestalt principles originate with Max Wertheimer, but almost any contemporary psychology of vision book replicates these examples and the images that demonstrate them. See, for instance E. Bruce Goldstein, *Sensation and Perception* (Belmont: Wadsworth Publishing Company, 1984).

[34] Malcolm Parkes, *Scribes, Scripts, and Readers* (London: Hambledon Press, 1991), Linda Brownrigg, *Medieval Book Production* (Los Altos Hills: Anderson-Lovelace, 1990) and Anthony Grafton and Megan Williams, *Christianity and the Tranformation of the Book* (Cambridge, MA: Belknap Press of Harvard University Press, 2006).

[35] Heniz von Foerster, *Understanding Understanding* (New York: Springer Verlag, 2003).

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