

□□□ ΜΝΗΜΟΣΥΝΗ: *Nel mezzo del engram* □□□

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(Synopsis)

I took a Ph.D. in Comparative Literature with a specialization in Italian literature (Dante and Semiotics), taught at UCLA, and worked at the Getty Research Institute for the History of Art and the Humanities in Los Angeles for seven years, doing research on prospective Scholars and on seminars. I was a producer for a major, international multi-year project (in cooperation with various Italian institutions) for research on and exhibitions of the Italian Renaissance painter “Dosso Dossi.” I also produced, for the director, Dr. Salvatore Settis, an annotated bibliography of work in the neurosciences, art history, and the humanities on the topic of “visual perception.” While working at the GRI, I was diagnosed with adult onset epilepsy, treated with a barrage of medications, and underwent “Asleep-Awake-Asleep” neurosurgery. My recovery involved—and still involves—substantially *different* post-resection experiences in language, imagery, and memory. I returned to my original work on cognitive processing in Dante’s texts¹ with an altered sense of polymodal “learning” and “memory.” I did some research on epilepsy and neurosurgery and wrote a book about my case.² When I contacted the professor who had mapped my brain during the surgery,³ she invited me to attend her class on Functional Neuroanatomy; I have since attended several classes at UCLA in Neuroscience, Neurobiology, Cognitive Psychology, and Neurolinguistics.⁴ And I have begun to think about imagery, *non*-declarative memory, hippocampal RAM, and cultural LTP.⁵

¹ with the profound sense of irony that a team of doctors had to carefully map my *selva oscura* while I took a wild, Dantesque, “A-A-A” trip (with Guido da Pisa) in the *mezzo* of my own *cammin*. Any citations I draw from Dante’s *Commedia* are from Giorgio Petrocchi, ed., *La Commedia secondo l’antica vulgata* (Milano: Mondadori, 1966), unless otherwise noted.

² *Brainquake: In the Grip of Epilepsy* (Philadelphia: Xlibris, 2003).

³ Assoc. Prof. Susan Y. Bookheimer, Psychiatry and Biobehavioral Sciences, UCLA.

⁴ Please see the attached list for the professors and classes involved.

⁵ “Long-term potentiation is the primary experimental model for investigating the synaptic basis of learning and memory in vertebrates.” T.V.P. Bliss and G.L. Collingridge, “A Synaptic Model of memory: long-term potentiation in the hippocampus.” *Nature* 361, 7 Jan 1993, 31-39, p. 31. *Please note: I will purposely observe the distinct rhetorical styles of notation practiced in the disciplines of the sciences and the humanities.*

My project is in the mode of the “humanities,”⁶ not the neurosciences; I cannot evade the genre of a first-person account.⁷ While my own “attention” is explicitly one subject of this project, another is the concept of *attentiveness*, a topic—and an issue—of major cultural importance.⁸ This project is not about *me*. (I’ve written that already.) It’s about a perspective on neurological issues that science doesn’t have (and, arguably, wants to avoid), and that certain disciplines of humanities insist on [pre]understanding from afar.⁹ In a sense, I am imitating Dante’s rhetorical presentation of his own interior self as a *whichever* brain,¹⁰ while standing in Augustine’s caves of memory, hearing Virgil’s discourse about Aeneas looking at the images of history on the walls in Carthage. I’m not claiming to be another Dante, but my narrative will *witness*, while my logic will argue. Here’s the case:

While working on understanding Dosso, scholar years on Memory and the Passions, and research on visual perception, my own neural circuitry (in the left temporal lobe [and hippocampus]) was intermittently blitzing itself in the auditory, visual, linguistic, and short-term memory decks. My seizures startle me awake from sleep, and produce radically altered, powerful moments of perception in multiple senses, i.e. in existence itself. They fragment those senses, pull them apart and itemize them, generating “fear” and sending waves of *déjà vu*. They perform *остранение*¹¹ on me. They scramble language and cognition and then shadow my episodic memory—my *μνημοσύνη*¹²—of them. When I report them to my neurologist, I try to be descriptive, and not narrative—right lobe, not left.¹³ And yet, I try for episodic, not semantic¹⁴: I try to remember the

⁶ Invoking distinctions between “Renaissance” and “medieval” models (outlined by A. Grafton and L. Jardine, *From Humanism to the Humanities: Education and the Liberal Arts in Fifteenth- and Sixteenth-Century Europe* [Cambridge: Harvard University Press, 1986]).

⁷ Benveniste et al.: who can? See “De la subjectivité dans le langage,” *Journal de psychologie*, 1958, reprinted in *Problèmes de linguistique générale* I.; p. 131: “nihil est in lingua quod non prius fuerit in oratione” in response to Aquinas, “nihil est in intellectu quod prius non fuerit in sensu.”

⁸ *Aufmerksamkeit* is Alois Riegl’s term; Riegl (and von Schlosser) will stand in here as reference to a complicated tradition of investigation and analysis of visual reception (see M. Olin’s monograph, *Forms of Representation. Alois Riegl’s Theory of Art*, 1992). There are some parallels between the First Vienna School’s interest in the non-figural, a tradition of literary criticism (H.R. Jauss et al), and some work on the neurology of vision itself.

⁹ N. Bryson, for example, insists on “the social character of the image, and its reality as *sign*”—a position staked out in *Vision and Painting: the Logic of the Gaze* (New Haven and London: Yale University Press, 1983), xii.

¹⁰ Reiterating Singleton’s insistence that “every” and “whichever” are crucially distinct (“The Allegorical Journey” in *Journey to Beatrice*, vol. II of *Dante Studies* [Cambridge, Mass.: Harvard University Press, 1958], pp. 3-14, p. 5).

¹¹ De-familiarization: “...to impart the sensation of things as they are perceived and not as they are known. The technique of art is to make objects ‘unfamiliar’....” Victor Shklovsky, “Art as Technique” in *Russian Formalist Criticism: Four Essays*, eds. Lemon and Reis (University of Nebraska Press, 1965), p. 12.

¹² As the art historian Aby Warburg’s concept of “memory”—I discuss this in more detail.

¹³ “The Split Brain Revisited,” by Michael S. Gazzaniga, *Scientific American*, July 1998, pp 51-55: “False memories originate in the left hemisphere...only the right is active during a true memory...” (p. 53); “[w]hen presented with new information, people usually remember much of what they experience. When questioned, they also usually claim to remember things that were not truly part of the experience. If split-brain patients are given such tests, the left hemisphere generates many false reports. But the right brain does not; it provides a much more veridical account ... the interpretive mechanism of the left hemisphere is always hard at work, seeking the meaning of events. It is constantly looking for order and reason, even when there is none—which leads it continually to make mistakes. It tends to overgeneralize, frequently constructing a potential past as opposed to a true one” (p. 54). (In his book, *The Mind’s Past* [University of California Press, 1998], Chapter 6: *Real Memories, Phony Memories* opens with Augustine’s famous citation on memory from Book X of the *Confessions* [p. 123]. Gazzaniga’s first sentence: “If only it were true.”) I’ll discuss this further.

experience, rather than analyze—in a classic Manzonian sense—what *must have* happened.¹⁵ It's hard to keep your left temporal lobe from making up stories—or theories—but I try. And yet, for this argument, the story is important.

When Dr. Settis took over the GRI, I undertook a major endeavor, producing a multi-year, international research and conference project on the Italian *cinquecento* painter known as Dosso Dossi. His work (in the court of Alfonso I d'Este at Ferrara) reflects some of the mysteries of Italian Renaissance culture manifest in neo-classical, allegorical subject matter (the Getty owns his *Allegoria della fortuna* and *Allegoria con Pan*). Our seminars addressed (in part) a prominent and difficult topic—how to interpret visual imagery with suggestive but (as yet) unclear literary or historical clues. In two years on that project, I spent a lot of time in Italy (Roma, Trento, Bologna...) looking at paintings (sculpture, monuments, ruins...), and listening to arguments about them. I'm not an art historian. Because my background is predominantly literary, I'm more of an argument historian. I spent time considering *how* we were understanding what we were looking at (and how we were arguing about it).

I did research on possible scholars to invite for upcoming scholar years on "Memory," "Collecting" and "Representing the Passions," all from a variety of disciplines. Because Salvatore had asked me to do an annotated bibliography on the general topic of "visual perception," I researched what the "sciences" "know" about neural "functions"—involving whether perception is "linguistically" organized or not¹⁶—and what the "humanities" "know" about the "concept" of "perception."¹⁷ I spent some time thinking about my quote marks, and did some Heideggerian "dwelling" on how, perhaps, some brains *gestalt* that we are culturally predetermined, while simultaneously dwelling on neuroscientific models of *gestalt*. And all the while I was intermittently having *gestalt*-fritzing seizures and contemplating whether I was, in any sense, relevant to the question of what is or is not "the case" (as opposed to "my case"). A question I contemplated: do we learn to make *gestalted* cultural sense (not just "practical sense") of our perception as a survival tactic? But, still, logically, (culturally *gestalted*) "a" and (survival) "b" are only corollaries.

I had more seizures in a Pandora's box of interlocking physiological and cognitive side-effects, "breaking through" all the medications. The only remaining treatment option was neurological invasion: "Asleep-Awake-Asleep" left-temporal-lobe neurosurgery, an attempt to remove the portions of the brain—as inferred from a battery of previous tests—which produce the seizures. I was awake—with my skull sawn open and my brain stuck with electrodes—for nearly three hours. Some *aides-de camp* spoke to me in English, Italian and French, because the team had to map the "eloquent cortex"—

¹⁴ Two distinct modes of memory. See Zola-Morgan S, Squire LR. Neuroanatomy of memory. *Ann Rev Neurosci* 1993;16:547–563.

¹⁵ To find "la strada che le cose *avrebbero dovuta* prendere per arrivare dove sono arrivate," *Del romanzo storico*, II.i.(paragraph 4), *Opere*, a cura di R. Bacchelli (Ricciardi: Milano, Napoli, 1953).

¹⁶ The argument of Zenon W. Pylyshyn, *Computation and Cognition: Toward a Foundation for Cognitive Science* (Cambridge: MIT Press, 1984), vs. that of Stephen M. Kosslyn, *Image and Brain: The Resolution of the Imagery Debate* (Cambridge: MIT Press, 1994) (among others).

¹⁷ Which contributed to the Getty seminar *Perception/Art*; it took place at the GRI May 5, 1999.

the geographical locations of those spoken languages and the performance of verbal naming of images of objects—before carefully removing brain tissue where intractable seizures originated (like landmines in the naming fields).

Right after the surgery, what came back first was not my native language, but bizarre imagery of random things: segments of Dosso paintings, figures walking in conflicting spatial planes, a *klettersteig* on a mountain in the Dolomites, mutating three-dimensional geometric forms, the vase from Simone Martini's *Annunciazione*, zoom shots of feet in a mosaic, and fractured snippets of Russian—a language in a different alphabet learned twenty years before and no longer spoken.¹⁸ In short, another universe.

I have difficulty, now, with names and nouns. In order to find words or construct sentences, I often have to construct words by sorting through acoustic rhymes or visual images, sometimes of things and *loci*, or of the written words. Sometimes I have to reason my way through multi-lingual syllables.¹⁹ Language itself—for me—is now a distinctly different world. Why? Because of packet-switching in my synapses.

Now I go to classes in various schools of the neurosciences. I listen with profound curiosity as the professors construct narratives to explain experiments done on synaptic functions of the hippocampus (*locus* of my seizures and a major target of synaptic neuroscience²⁰). I listen to their rhetoric and contemplate their visual artifacts—diagrams, symbols, graphs, math—trying to understand the logic of the problem. But now—post-surgery—I also have to stave off marauding *imagery* of numbers climbing boxes and shooting arrows and Greek letters teeter-tottering with each other.

Things, for me, have changed.²¹ Thinking—in discourse and imagery—has transmogrified. Thinking *about* discourse and imagery has transmogrified.

ΜΝΗΜΟΣΥΝΗ: *Nel mezzo del engram* maps some of the multiple dimensions of this larger *selva oscura*.

The exploratory team includes Pietro Alighieri, Guido da Pisa, Aby Warburg, Michael Baxandall, David Freedberg, Antonio Damasio, Michael Gazzaniga, Joseph LeDoux, Larry Squire, C.S. Peirce, Gianni Vattimo, Augustine of Hippo, Karl Lashley,

¹⁸ From Bookheimer's neuroanatomy class: the brain makes functional anatomical distinctions, not only between imagery and language, but among the categories of language(s): speaking, writing, understanding, hearing, and reading.

¹⁹ There are different pathways (superior and inferior) for segment phonology and piecemeal analysis versus whole word recognition. Different parts of the brain "store" different kinds of things and processes; language is (almost always) in the left temporal lobe; music, prosody, intonations, environmental noises are processed in the right. Symbolic math involves the temporal, parietal and the occipital lobes. The anterior frontal lobe puts separate things together in chunks. Her summary: "Any kind of chunking works."

²⁰ "The hippocampal formation has attracted considerable attention during the recent explosion of interest in cellular and synaptic neuroscience... (a) It is a region of the brain implicated in a number of important (and interesting) "normal" behaviors, such as learning and memory; (b) both functionally and structurally, the hippocampus shows an unusual degree of neuronal "plasticity"; (c) it has been implicated as a focus of pathology in a number of neurologic disorders ranging from epilepsy to global ischemia to Alzheimer's disease to traumatic head injury...." Jerome Engel, Jr. and Timothy A. Pedley, *Epilepsy. The Comprehensive CD-Rom*. Lippincott Williams & Wilkins, 1999; Chapter 28: *Limbic Anatomy and Physiology*.

²¹ Both *cogitans* and *extensa*.

Richard Semon, C.P. Snow, Stephen Kosslyn, Semir Zeki, E. O. Wilson, the stone Assyrian bas-relief from Nimrud, Charles Singleton, Ernst Curtius, Dosso Dossi, Dante Alighieri, and the Horn of Ammon.

The humanities could argue that the narrative of science is just another narrative. Art history could argue that it (art history) alone embraces (or subsumes?) the visual.²² Science, including Neuroscience, could argue that it's trying to use something other than left-temporal-lobe stories to think with, because there is something other than the story to (*choose your verb here*) ... "think about." The voyage of the vast frontal lobe (through time and space) might be to get the myelinated troops from boot-camp, "image" some vectors for this problem and try them out. Do we want to stroll the portico and rhetorically argue ourselves into thinking that we already know how we can think? That we know all the vectors? Or shall we try to *grok* some LTP and send out another recon (shooting for a "newcon") foray?

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UCLA Classes in the Neurosciences pertinent to this paper:

Information on most of these professors can be found at the website:

COMPLETE LIST OF NEUROSCIENCE FACULTY

<http://www.medsch.ucla.edu/som/bri/nsidp/faculty/fullfac.htm>

(Many also have additional websites of their own.)

Fall 00

Ad hoc class on functional neuroanatomy, Susan Y. Bookheimer, Psychiatry and Biobehavioral Sciences

Winter 01

Neurosci M130 Biological bases of psychiatric disorders - Levine, M.S.

Linguistics C235. Neurolinguistics - Curtiss, S.R.

See: <http://www.linguistics.ucla.edu/people/curtiss/curtiss.htm>

Spring 01

Neurobio 200E. Regulatory, Behavioral, and Cognitive Neurobiology - Micevych, P.E. / Silva, A.J. et al (see below)

Neurosci m205. Behavioral & Systems Neuroscience - Colwell, C.S. et al (see below)

Psychtry 208B. Clinical Neuropsychiatry - Asarnow, R.F.

Psych 265. Thinking – Holyoak, K.

²² Even if, on the part of some, as a kind of graphical user interface of essentially linguistic "concepts"—I discuss this in more detail.



See: <http://www.psych.ucla.edu/Faculty/HOLYOAK/Default.htm>

Winter 02

M169 History of Neurosciences - Frank Jr, R.G.

Several of these classes were taught by teams including:

Department of Psychiatry & Biobehavioral Sciences

Mark Barad

Susan Y. Bookheimer

Christopher Colwell

Alcino J. Silva (also Depts. of Neurobiology and Psychology)

Departments of Neurobiology and Psychology

Dean Buonomano

Department of Neurobiology

Roger Gorski

Charles Woody (also Dept. of Psychiatry and Biobehavioral Sciences)

Department of Physiological Science

David Glanzman

Department of Psychology

Stan Schein