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The Computer as Theater of Memory¹

The functions of the brain are so complex and imponderable that in order to make them at all conceivable we must seek recourse in metaphor. Such metaphors are not constant, however, but vary with the course of history.² Thus, for some time now, we have been able to observe a shift in the prevalent model of the human memory: from a repository to a theatrical stage.³ The objects of our recollection no longer seem to us to constitute a passive inventory for deposit and withdrawal; rather, they seem far more like actors in a succession of changing *mis-en-scène*.

The metaphor shift in the neuro-sciences goes hand in hand with corresponding changes in the ways we speak about computers. In the wake of advances in interactive applications, the function of digital technology is no longer described merely in terms of "storage and retrieval," but rather in terms of the performativity of images in motion. In this connection, one of the most influential books about contemporary computer interface design is entitled *Computers as theatre* (1990); its author, Brenda Laurel, was one of the first to propagate this new way of looking at computers.

What does it mean to conceive of the computer as theater? Is this an appropriate form of metaphorization? Or does it tend to conceal, rather than to capture, the actual processes? Could it be that there is even more to this metaphor than at first meets the eye? What sorts of historical affinities does it reveal? Do older forms of theatricality

¹The issues introduced here will be explored in more depth in a research project led by the author on the theme "The Computer as Theater of Memory." More information can be obtained online at www.sfb-performativ.de/seiten/b7.html.

²Cf. Draaisma, Douwe, *Die Metaphernmaschine. Eine Geschichte des Gedächtnisses* (Darmstadt, 1999).

³ Cf. Bernard J. Baars, *Das Schauspiel des Denkens* (Stuttgart, 1998).

return in computer theater? Do they do so as the belated fulfillment of past promise, or as a parody of their former content? And what repercussions, finally, does construing computer memory in theatrical terms have for our image of the human memory?

My essay will take up these questions. But before they can be answered, we must first specify what sort of theater – if it is to describe the interaction with computers – we might have in mind. The possibilities are many and various. For instance, faced with the cabaret productions that the desktops of even serious text- and data-processing programs seem to have become, some users might be reminded of vaudeville, and might deplore, with Neil Postman, the banality of "infotainment."⁴ In contrast, Umberto Eco takes the "icons" of the newer user interfaces quite literally: in the market victory of the graphical user interface popularized by Macintosh, Eco recognizes the historical drama of the Counter-Reformation, thus prompting questions of a religious-historical nature – such as whether MS-DOS is Calvinist.⁵ Brenda Laurel goes one step further and proclaims Greek tragedy of the 5th and early 4th centuries BC to be the archetype of and the model for mouse-driven interaction.⁶ There is no irony intended in the comparison, and it is worth taking a closer look at the foundations of the argument.

Laurel points to the Dionysian context of ancient Greek tragedy and emphasizes its ritualistic aspect as against the cognitive aspect that we normally associate with computers. On her account, the distinguishing character of computers consists not so much in their representation of knowledge, but rather more in their representation of actions in which human beings participate. She calls for a human-machine interaction that, like the theatrical praxis of Greek tragedy, would incorporate all aspects of life, including spiritual experiences:

⁴ Cf. Neil Postman, *Amusing Ourselves to Death: Public Discourse in the Age of Show Business* (New York, 1985).

⁵ Umberto Eco, "MS-DOS ist calvinistisch: Über die Religion der Betriebssysteme," *Spiegel-Spezial* 3 (1995): 38.

⁶ Brenda Laurel, *Computers as Theatre* (Reading, Mass., 1991) 38.

"Recall that in the Greek theatre, actors were the priests of Dionysus, the god of ecstasy and rebirth, and during the act of performance they felt themselves to be in possession of the god [...].

I think we can someday have Dionysian experiences in virtual reality, and that they will be experiences of the most intimate and powerful kind [...].

But for virtual reality to fulfill its highest potential, we must reinvent the sacred spaces where we collaborate with reality in order to transform it and ourselves."⁷

If this re-sacralization of virtual reality were to succeed, she enthusiastically concludes, it would be a "quantum leap in human evolution."⁸

When one looks around on the Net, one can certainly get the impression that Laurel's vision is not all that far from being realized. Digital amphitheaters with names such as "Holy Mission," "Quest for the Eternals," or "Heaven's Door" offer the visitor an experience of self-transformation through participation as "Avatar," the Hinduistic term by which cybernetic reincarnation most commonly goes.⁹ Under certain circumstances, this virtual drama can even lead to real tragedy, as in the case of the collective suicide of cult leader Applewhite and thirty-eight of his followers, who abandoned their "containers" – as they called their own bodies – in order to catch a heavenly ride on Comet Hale-Bopp. The Internet had provided them with an earthly living, but, at the same time, it apparently also fueled their yearning for disembodiment. While working on projects for their web-design agency "Higher Source," they kept a constant eye on the animated comet's tail of the Netscape browser's logo. And in their virtual home, on their homepage at "heavensgate.com", they announced their imminent union with the real higher source in the following words:

⁷ Laurel 196f.

⁸ Laurel 198.

⁹ On this subject, see Peter Matussek, "'www.heavensgate.com' – Virtuelles Leben zwischen Eskapismus und Ekstase," *Paragrana* 6 (1997): 129–147.

"If you study the material on the website you will hopefully understand our joy and what our purpose here on earth has been. You may even find your 'boarding pass' to leave with us [...]"¹⁰

Admittedly, this was not what Brenda Laurel, a thoroughly life-affirming computer scientist, had in mind. Yet we might have already learned from the ancient Greek texts that ecstatic practices are not without their dangers. There, many an initiate in the grip of Dionysian madness did not return from his altered state, or made bloodthirsty claims on the lives of others. Even if the use of digital simulacra generally sheds no blood, the effects are not unproblematic. And when computer kids describe their ecstatic Avatar experiences in the terms documented by the computer psychologist Sherry Turkle, it is only a small step from ecstasy to escapism: "'This is more real than my real life,' says a character who turns out to be a man playing a woman who is pretending to be a man."¹¹

Yet, despite the ambivalences inherent in such statements, one must concede to Brenda Laurel that Greek tragedy is not the worst model for today's computer interfaces. We continue to consider it as the epitome of a unified culture of multimedial participation, and look back on it enviously from the standpoint of an impoverished, alphanumeric, high-tech civilization. Theorists of the media from McLuhan, through Walter Ong, to Vilém Flusser have found it thoroughly worthwhile to aspire to break away from the text-boundedness of the Gutenberg galaxy, and finally to break through to a second orality, visuality, and tactility of the Turing galaxy. The computer, in its function as calculating machine, may stand at the farthest remove from the participatory experience of Greek tragedy (or, what we take it to be); but if it should now also become the instrument of the return of that development, then this would be only fitting.

The extent to which the comparison Laurel attempts may actually involve either the return of historical phenomena, or only a parody of them – the satyr play *after* the

¹⁰ Sources: www.heavensgate.com and www.highersource.com. In order to be able to give away as many of these boarding passes as possible, the *Heaven's Gate* programmers embedded hidden Internet search engine key-words in the code of their webpages. These included "Angels," "Away Team," "Bodhisattva," "Glorified Body," "Theosophy," and "Yahweh."

¹¹ Sherry Turkle, *Life on the Screen: Identity in the Age of the Internet* (New York, 1995) 10.

tragedy – is a question I will not pursue further here. What may be established, however, is what kind of technology can accommodate the postulated participatory experience. This technology is an interface design that allows the user to merge completely with the events in cyberspace, as if immersed in them. Brenda Laurel speaks laconically of a "vanishing interface." With the saying, "Whoever discovered water [...] certainly wasn't a fish," she reminds us that a medium can offer a perfect environment only when we do not at all recognize it *as* a medium.¹²

This may well be a fascinating perspective for adventure games. But is it also a valid one for other forms of computer use – say, for scholarly works *about* adventure games? At best, we can concede this to be the case for the initial field research phase, in which, on the pretext of scientific inquiry, unsuspecting children are robbed of their Lara Croft CDs in order to provide the researchers with practical experience of the "vanishing interface" phenomenon. But otherwise, we tend to find theatrically-staged elements rather disruptive of scholarly work. Certainly, to forget the mediality of a book or computer screen is the very measure of mental absorption in research, reading, or contemplation. However, this kind of situational forgetfulness is not achieved through the intensified performativity of data presentation, but rather, on the contrary, through its immutability, which leads to tunnel effects in our attention. This is vividly illustrated in Plato's anecdote about the philosopher Thales, who fell into a fountain while making astronomical observations. He may have felt like a fish then, but he was surely hard pressed to enjoy the immersion experience that startled him out of his contemplation. The situation is here the reverse of the computer theater favored by Brenda Laurel: Our imaginative activity diminishes in direct proportion to the increased activity on the screen. Whomever the programmers at Microsoft had in mind when they put a smart-alecky, comic-book assistant in the text-editing window, who starts making noises of boredom as soon as we pause to reflect, so that we have to turn our attention to him instead of to our thoughts – whomever these programmers had in mind, it couldn't have possibly been anyone

¹² Laurel 210.

who wants to use this word processing software to actually process their own words (i.e., to write).

On the other hand, it would be a mistake to believe that any text-editing or database software could be entirely free of staged elements that shape the form of the presented information, and thus also influence the process of its reception. Programmers have to pull quite a few illusionistic tricks before a "page," an "index card," or a "folder" can appear on the monitor. In this regard, the contemporary standards for Mac and Windows environments are not historically indifferent. They, too, can be traced back to an antique heritage – although it is one that stands in opposition to that of Greek tragedy. As Nicholas Negroponte has implied,¹³ there is an affinity between Simonides von Keos, to whom the Roman rhetoricians ascribed the invention of the ancient art of memory, and Steve Jobs, who supposedly invented the Macintosh User Interface.¹⁴ This new interface put to new use an old insight of the Roman rhetoric manuals – namely, that the highest degree of mnemonic efficiency is exhibited by techniques involving topographical arrangements of mental images (*loci et imagines*). That the use of image-based technology might have involved an actual historical reprise in the computer age was explicitly reflected already by the *Architecture Machine Group* who developed the *Spatial Data Management System* during the seventies. As Richard Bolt reports: "Intrinsic to the ensemble of studies outlined in the proposal was a study recalling the ancient principle of using spatial cueing as an aid to performance and memory: the 'Simonides Effect'."¹⁵ And also the *Human Interface Guidelines*,¹⁶ which were

¹³ Nicholas Negroponte, *Total digital. Die Welt zwischen 0 und 1 oder Die Zukunft der Kommunikation* (Munich, 1995) 135ff.

¹⁴ In fact, the parallel between Simonides and Jobs extends to the dubiousness of both assumptions of authorship. In the former case, the Simonides inheritance of the Roman rhetoricians should be seen merely as a legitimating legend (cf. Stefan Goldmann, "Statt Totenklage Gedächtnis: Zur Erfindung der Mnemotechnik durch Simonides von Keos," *Poetica* 21 [1989]: 43–66) and in the latter case, it was not Steve Jobs, but rather Lawrence Tesler, of Xerox PARC, who developed the foundational elements of the Macintosh Interface (cf. Owen W. Linzmayer, *Apple Confidential: The Real Story of Apple Computer, Inc.*, [San Francisco, 1999] 51ff).

¹⁵ Richard A. Bolt, *Spatial Data Management*, (Cambridge, Mass., 1979) 8.

¹⁶ Apple Computer Inc., *Human Interface Guidelines: The Apple Desktop Interface*, (Reading, Mass., 1987).

developed by Apple's Human Interface Group during the eighties could well have been borrowed from the traditional teachings of rhetorical *ars memoria*. In addition to the basic "See-and-Point" principle, which recalls the ancient *loci et imagines*, the most important key words in the *Guidelines* are "Feedback and Dialog," "Consistency," and "Perceived Stability." In the *Rhetorica Ad Herennium* we read that rote learning is most effective "when we [employ] not mute and indistinct images, but rather ones that set something in motion" (Apple's "feedback and dialog"); these actuating images (*imagines agentes*) must be "arranged at certain fixed locations" (Apple's "Consistency"); and finally, says the *Rhetorica*, there must be no opportunity for us to "accidentally be mistaken in the number of locations" (Apple's "Perceived Stability").¹⁷ Psychological studies in the work place have confirmed that these principles considerably increase the ease with which the use of operating systems and software applications is learned.¹⁸

However, the Macintosh desktop was designed for a relatively small, manageable amount of data. At its inception, the user had 128 KB RAM and 400 KB internal "mass" storage at his or her disposal. Under these conditions, whatever one had to arrange on the monitor's surface in terms of icons, menus, and program or document windows, was held within the limits of manageability. Today's personal computers – with a storage capacity many thousand times larger than before, and with Internet access to amounts of data that, printed out, would cover the entire globe – pose qualitatively incomparable challenges to creating a mnemonically meaningful presentation.

It is evident that, considering the explosion in user-designated storage options, the particular architecture of memory suggested by the desktop metaphor will have been put out of joint. And if we stick to the terms of our historical analogy, we might say that the current situation corresponds to the phase in which the classical memory palaces of antiquity gradually collapsed under the pressure of increasing amounts of

¹⁷ *Rhetorica Ad Herennium* III, XVIIIff., Apple Computer 3ff.

¹⁸ Cf., e.g., Alexandra Altmann, "Direkte Manipulation: Empirische Befunde zum Einfluß der Benutzeroberfläche auf die Erlernbarkeit von Textsystemen," *A&O: Zeitschrift für Arbeits- und Organisationspsychologie* 3 (1987): 108-114.

amassed knowledge. Thus, today's PC-user, faced with the overabundance of nested memory blocks on his desktop, may feel somewhat like St. Augustine when the latter reports of toilsome excursions through "the plains, and caves, and caverns of [...] memory, innumerable and innumerably full of innumerable kinds of things."¹⁹

"When I enter there, I require what I will to be brought forth, and something instantly comes; others must be longer sought after, which are fetched, as it were, out of some inner receptacle; others rush out in troops, and while one thing is desired and required, they start forth, as who should say, 'Is it perchance I?' These I drive away [...] until what I wish for be unveiled, and appear in sight, out of its secret place."²⁰

And Augustine had even anticipated the solution to the problem – a change of perspective: from that of a fixed standpoint within the classical architecture of memory (in which individual memories can be found as if by reading off their location from a wax tablet)²¹ to that of a free movement in space. "Over all these [memories]," he writes, "do I run, I fly; I dive on this side and that, as far as I can, and there is no end."²² Some readers might well be reminded here of William Gibson's "Cyberspace."²³ And certainly, the staging of memory in the *Confessions* is not unlike that of *Neuromancer*.

Indeed in the past as well as in the present, there have been parallel attempts to actually approach this fiction in reality. The historical pivot of such attempts rests in a kind of theater that I would like to propose here in contrast to the one suggested by Brenda Laurel: the memory theater of Giulio Camillo.

Camillo's intention, as we can gather from his treatise *L'idea del teatro*²⁴ and from contemporary reports, was to reanimate the art of memory in the spirit of Neo-Platonism. The antique *ars memoria* was, despite the fact that we translate *ars* as

¹⁹ Augustine, *Confessions*, trans. Edward B. Pusey, 55th printing (New York, 1965) 174.

²⁰ Augustine 166.

²¹ *Ad Her.* III, XVII.

²² Augustine 174.

²³ Cf. Erik Davis, "Techgnosis, Magic, Memory, and the Angels of Information," *Flame Wars: The Discourse of Cyberculture*, ed. Mark Dery (Durham and London 1994) 34f.

²⁴ Giulio Camillo, *L' Idea del Teatro* (Florence, 1550). Cf. Giulio Camillo, *L' Idea del Teatro* with Engl. trans., *An Examination of L' Idea del Teatro of Giulio Camillo* by Lu Beery Wenneker, diss., Pittsburgh, 1970.

"art," not a *poiesis*, but a *techné*. It was not meant to release the vital force (*vis*) accumulated in living memories; rather, it was more like a practice of taxidermic mounting meant to improve retentiveness. The Simonides story testifies most vividly to this necrotic tendency: It reports of a banquet at which the remains of guests crushed to death in their seats were easily identifiable by way of being gruesomely fixed in their pre-assigned places. Yet the Roman textbooks of rhetoric advised the use of *imagines agentes* whose composition, on the express recommendation of the author of the *Rhetorica ad Herennium*, should be left to the fantasy of the memorizer. The Roman model thus still contained elements of a productive use of the imagination. It was the scholastic treatises of the middle ages that curbed this remnant of mnemonic freedom in favor of a mechanical rote learning of prayers, virtues, and lists of objects.²⁵ And it is here that Camillo comes in with his attempt to reanimate the now mechanical and uncreative *memoria*.

For this purpose, he transplanted the arena of *ars memoria* from the traditional treasuries (*thesauri*) and palaces of memory to the Vitruvian theater.²⁶ The "drama" that he produced on this stage made use of the teachings of antiquity, but dressed them up in hermetic, cabalistic costume. Camillo also departed from the tradition in one other aspect, in that he reversed the topography of the neo-Classical theater's structure. The visitor stood on the stage and gazed into the amphitheater-like auditorium, whose tiered, half-round construction was particularly suitable for housing the memories in a clearly laid-out fashion – seven sections, each with seven arches spanning seven rising tiers. With this inversion, the efficiency of the ancient architecture of memory could be significantly increased. Viglius Zuichemus, who had the privilege of visiting the mystery-shrouded theater, writes to Erasmus:

²⁵ Cf. Frances Yates, *The Art of Memory* (London, 1966) 114ff. This does not stand in contradiction to Horst Wenzel's observations on the participatory character of medieval *memoria* in Horst Wenzel, *Hören und Sehen. Schrift und Bild. Kultur und Gedächtnis im Mittelalter* (Munich, 1995).

²⁶ Here, I pass over the objections raised against Yates' reconstruction by Julia Mummenhoff ("Das Gedächtnistheater des Giulio Camillo," *Denkräume zwischen Kunst und Wissenschaft. 5. Kunsthistorikerinnentagung*, eds. Silvia Baumgart et al., [Hamburg, Berlin et al., 1993]: 177–198) and Lou Beery Wencker, since these are irrelevant to my argument.

"The work is of wood, marked with many images, and full of little boxes; there are various orders and grades in it. He gives a place to each individual figure and ornament, and he showed me such a mass of papers that, though I always heard that Cicero was the fountain of richest eloquence, scarcely would I have thought that [...] so many volumes could be pieced together out of his writings."²⁷

This arrangement of astrological and cabalistic signs, allegories, and emblematic elements was made flexible through the use of the Lullistic *ars combinatoria*. But that an undreamt-of quantity of information could be contained in such a relatively small construction (presumably, it was a cabinet in which just about two people could stand upright²⁸) is mainly due to the fact that Camillo conceived of his mnemonic system as a navigable space. Its user could move through the three-dimensional arrangement of his own will and vary his view between near and far accordingly. Camillo explicates the advantages of this mobility in an analogy to a forest, which we experience as unfathomable when we are within its plane, but which we increasingly apprehend in its overall shape, the more our view point is raised above it.²⁹

The history of the newer interface technology similarly begins with a mobilization of the memory map. A first step in this direction was the above mentioned *Spatial Data Management System*. It allowed the user to switch back and forth between different screens whose contents he could zoom toward or away from him, creating the impression of navigating through a "dataland."³⁰ Hypertext, Hypercard and HTML, the original language of the World Wide Web, have popularized this kind of navigation in two-dimensional form. For some years now, there has been work on their expansion through 3D visualization processes: vector-driven cartographies such as Hyper-G, Xspace, or VRML, which alter the depicted space with every movement of the mouse. Such means are used to attempt to increase the number of memory locations without creating disorientation. This transition from

²⁷ Yates 136.

²⁸ This may be extrapolated from Viglius Zuichemus' letter to Erasmus. Erasmus Desiderius Roterdamus, *Opus Epistolarum des. Erasmi Roterdami denvo Recognitum et Auctum per P .S. Allen*, ed. H. M. Allen and H. W. Garrod, vol. 10 (Oxford, 1941) 30.

²⁹ Yates 147f.

³⁰Bolt 13.

a static, topographical memory space to an active, navigable one suggests the comparison with Camillo's theatricalization of the *ars memoria*.

No doubt the juxtaposition of two historical moments has something of a burlesque reductionism about it. But the parodic element had been brought into play by Camillo himself. Thus, during his own lifetime, there were already polemics in which his theater was held up to the great works of contemporary rhetoricians and found lacking. As Eugenio Garin explicitly noted, the theater's construction was seen as a mere "parody of all that the Renaissance theorists had rigorously attempted."³¹ Dolet and other Parisien scholars referred to Camillo unceremoniously as a "quack."³²

This might be traced back particularly to Viglius' report; for it, too, is not devoid of ironic distance. The letter to Erasmus is tinged with something of that coy display of one's own technical ignorance that is, to this day, the distinguishing feature of the educated humanist. Viglius also expressly emphasizes that Camillo could speak "Latin with difficulty," and makes clear in this erection of a language barrier that his marveling is based more on bewilderment than on respect. And it is Camillo's spiritual fervor that is particularly suspect for Viglius. He reports that he only managed to secure his initiation into the arcanum by feigning great enthusiasm, whereby he was "speaking religiously" and pretended to be "stupefied by the miraculousness of the thing."³³

The Viglius Zuichemus of our time probably writes for the culture section of a high-brow paper, in whose employ he might also be called upon to write about people such as Ted Nelson, creator of the neologisms "docuverse" and "hypertext." This latter-day Viglius may also see himself, tongue firmly in cheek, compelled to use the language of religion and to act as if captivated. Is there, then, also a historical

³¹ Eugenio Garin, *Alcuni aspetti delle retoriche rinascimentali* (Rome and Milan, 1953). Cited in Paolo Rossi, *Clavis Universalis: arti della memoria e logica combinatoria da Lullo a Leibniz* (new edition; Bologna, 1983) 119n8.

³² Erasmus, vol. 9 (Oxford, 1938) 479, footnote.

³³ cited in Yates 136.

parallel with regard to an occult spirituality? Do similarities in mechanical function also give rise to similar forms of bewitching fascination?

On Frances Yates' account, the historical explanation for Camillo's magic lies in the writings of the Hermetics. In this literature, the microcosm of the human being represents the divine macrocosm by analogy and thus transforms the human being into the *alter deus* who carries the universe in his memory. There is a structural affinity between such ideas and the digital theater of memory; notwithstanding the incomparability of the mythological connotations or the historical contexts in which these were valid, today's technology produces similar effects: The "Pan-Mnemonism"³⁴ of our time is nourished by the dream of a universal, encyclopedic machine. And, according to Paulo Rossi, this dream also constitutes the central moment distinguishing Camillo's *Teatrum Mundi* from the classical *ars reminiscendi*.³⁵ The above-mentioned hypertext-guru Ted Nelson has something comparable in mind:

"Universal or grand hypertext [...] means [...] an accessible great universe of linked documents and graphics [...]. This is an idea many people now share – the idea that we can get to everything, add to everything, keep track of everything, tie everything together, that we can have it all."³⁶

What's at stake here is no longer mere, profane information retrieval, the functional organization and recall of locations in the memory. What's at stake is the spellbinding attraction of an omnipotence fantasy: having the sum total of the world's knowledge at one's disposal. And the Lullistically-inclined spirituality of the "divine Camillo" – as he was known to his contemporaries³⁷ – had also partaken no less of this intoxicating source. His theatrical model resituated the visitor in the position of world creator – a move that his patron, the King of France, surely appreciated.

Now, it is in the nature of the dream of a total encyclopedia that it must remain a dream. In this respect, it is worth noting that Camillo's *Idea del Theatro* (which he

³⁴ Elisabeth von Samsonow, "Zeit bei Giordano Bruno oder: Zum Verhältnis von Kosmochronie und Mnemochronie," eds. Eric Alliez et al., *Metamorphosen der Zeit* (Munich, 1999) 140.

³⁵ Rossi 118ff.

³⁶ cited in Robert E. Horn, *Mapping Hypertext: Analysis, Linkage, and Display of Knowledge for the Next Generation of On-Line Text and Graphics* (Waltham, 1989) 259.

³⁷ Yates 135.

dictated shortly before his death, with decades of construction work behind him) was formulated in the future tense – as if the actual theater of memory was still to be built. Incompleteness is here no shortcoming, but rather a surplus; it does not mitigate, but rather intensifies the mystery. The World Wide Web, too, owes its aura as pan-mnemonic docuverse to the *sfumato* of a diffuse presentation of data, whose incompleteness stimulates us to act on hunches and intuitions, and thus produces that feeling of exuberant spatial experience with which passionate web-surfers are filled. The necessarily limited frame of the monitor only augments this experience through its peephole effect; it feeds the voyeuristic fantasy that there is still something infinitely more thrilling to discover than what is actually before one's eyes. The *Idea del Teatro* also leaves much in the dark. Its "revelation" begins with a reference to the significance of silence in the face of divine secrets. And no doubt, Camillo's mystique only profited from the fact that he divulged just bits and pieces about how his theater was made.³⁸

There are numerous other points of comparison, but the parallels already cited should suffice to provide the background against which the principal differences might now emerge. These, namely, rest on an overabundant realization of the idea of Camillo's theater by means of digital 3D visualization techniques. What differentiates Camillo from today's cybernauts and sheds light on the possibly untapped potential of the digital theater of memory is the fact that his data construction always appears *as* theater. The sites and images of his model are not meant to fascinate in an unmediated way, but should rather be reflected on as staged objects. They are *imagines agentes*, active, actuating images, not because their specific function is the "painting of an entire scene," but rather because the imagination is stimulated through their agency.³⁹ Camillo expressly emphasizes the matter that concerns him:

³⁸ Cf. Yates 140.

³⁹ The *Rhetorica ad Herennium* III, 37 makes clear that they are called "*imagines agentes*" because they are striking images that stimulate the mind – rather than being "mute and indistinct" ("*non mutas nec vagas*") – and not, as Schmidt-Biggeman writes, because it is their specific function to "paint an entire scene" (Willhelm Schmidt-Biggeman, "Robert Fludds *Theatrum memoriae*," *Ars memorativa. Zur kulturgeschichtlichen Bedeutung der Gedächtniskunst 1400-1750*, eds. Jörg Jochen Berns and Wolfgang Neuber [Tübingen, 1993] 157; see also 156).

"to find, in these seven comprehensive and diverse units, an order that keeps the mind keen and shakes up the memory."⁴⁰ In contrast, the technical activation of images by means of computer animation does not lead to reflection but is instead perceived passively, in a reflex-like manner; instead of shaking up the memory, it conditions it. Camillo's theater presents itself as an enclosed space, and, precisely for that reason, incites one to transcend it. On the other hand, the forms of 3D visualization, which give the illusion of endless space, prevent the data-traveler from realizing that the trajectory of his transit is fixed and thus undermine the desire for transcendence.

This fundamental difference in reception despite a superficial similarity of presentation was brought about as a consequence of an earlier technological transformation, which makes itself manifest on hand of the change in panorama technology at the beginning of the 19th century. As Jonathan Crary emphasizes, a decisive turnabout in the techniques of observation takes place at this time: In the older panoramas (such as the famous London one of 1791), the visitor walked about inside; in the diorama of 1823, the observer stood at a fixed point, and the panoramic image revolved around him.⁴¹ Thus, the activity of the recipient was literally brought to a standstill – that is to say, transferred over to the apparatus. An analogous phenomenon can, in my assessment, be traced in the difference between the memory theaters of the Renaissance and the animated virtual reality scenarios of today's computer interfaces. In Camillo's theater, the visitor similarly went inside and actively moved within the collection of memories, while the computer navigator, armed with his mouse, is condemned to immobility before the screen. In contrast to Crary, however, I see this difference as being purely metaphorical. It is not necessary to set the body in motion in order to mobilize the mind (that the Peripatetics philosophized *ambulando* is commonly known to be a rumor). It is not necessary to

⁴⁰ Cited in Mummenhoff 182 (English version follows the German translation). The formulation that the memory should be "shaken up" (originally, *percossa*) underscores the self-relexive character of this remembering in the sense of Platonic anamnesis, which also goes hand in hand with a concussive experience, namely that of *aporia*.

⁴¹ Jonathan Crary, *Techniken des Betrachters. Sehen und Moderne im 19. Jahrhundert* (Basel, 1996) 117f.

do away with sitting still in front of the screen in order to achieve mental mobility in Camillo's sense – and besides, the bodily movements of the user come into play again in the newer "cave" installations. What is decisive is the orientation of inner movement. With computer animation, it is directed unambiguously at the consumption of an object; in Camillo however, the self-reflexive contemplation of the object by a subject also involves a rebound movement back to the subject. This reflexivity is made evident in Camillo's inversion of the theater structure, which places the objects of memory in the tiers, where *they* simultaneously return the gaze of the observer while he stands on the stage and constitutes the center of intellectual activity. This inversion of the classical Vitruvian theater means that Camillo had already effected a reversal of the very transformation that Crary pinpoints as only having first taken place with the diorama. Thus, Camillo stands at a critical distance not only to the traditional memory architectures of the ancients, but also to the systems of memory theater developed immediately after his – from Zwinger's *Theatrum vitae humanae* (1565) and Quicchebergs *Inscriptiones vel tituli theatri amplissimi* (1565) through Pierre Boaistuau's *Theatrum Mundi* (1581), Lomazzo's *L'Idée del Tempio della Pittura* (1590), Bodin's *Universae Naturae Theatrum* (1597) and Alsted's *Theatrum Scholasticum* (1610), to the *Theatrum orbi* in Robert Fludd's *Ars memoriae* (1697).

Does this turnaround make Camillo's memory theater a viable model for turning the digital staging of information into a self-reflective form? There have been occasional attempts in artistic as well as in scientific experimental research, that suggest this – for the most part implicitly, but at times also in an explicit play upon Camillo.⁴² They indicate that an anamnesis of computer-presented data is encouraged

⁴² In this field of reception, the transition from analog to digital media may be seen as a repetition of the "panoramic turn." Pre-digital projects like Bill Viola's video installation *The Theatre of Memory* (1985) or the installation exhibit *Memoriatheater* by Mikael Thejll (1993) create staged spaces that call on the recipient to move around on his own initiative. In contrast, computer simulations such as Robert Edgar's *Memory Theater One* (1985) or the *Memory Theater VR* by Agnes Hegedüs (1997) propell the amphitheatrical space around a fixed viewing point. Net art – e.g., the Camillo installations of Emil Hrvatin (www.ljudmila.org/camillo/front.htm) – appears to take up an intermediary position between the two models of reception: on the one hand, it operates with illusionistic, computer-animated elements that move around on the monitor before the fixed gaze of the beholder; on the other, it counteracts this illusion of movement with a data presentation whose

not, as postulated by Brenda Laurel, when the interface vanishes, but rather, on the contrary, when it is mirrored back to the observer.

What could this mean for the concrete praxis of the way information is staged in the future?

Camillo's example cannot help us any further. No records of what the *Theatro* actually looked like have survived. It may be that it's construction was never completed, which would have been entirely in accordance with Camillo's intentions. Only as long as he continued to work on its expansion, to endeavor constantly to overhaul its architecture and iconology, could he have given himself and others the feeling of being on the trail of the secret of the alchemistic transformation of memory into recollection.

flat, consciously pronounced forms demand a self-motivated, autonomously selective act of reading and beholding. And so it seems that it is hyper-media such as the World Wide Web that are destined to carry out the "epicisation" of performative modes that Brecht had envisioned for the traditional theater. (That such tendencies toward "epic" forms are not unknown in the recent history of art can be seen on hand of a suggestive example: Anna Brailovsky, "The Epic Tableau: *Verfremdungseffekte* in Anselm Kiefer's *Varus*," *New German Critique* 71 [1997]: 115-141.)