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Reading (in) the Net

Aesthetic Experience in Computer-Based Media

In his empirical theory of literature *Filozofia Przypadku* [*Philosophy of Chance*] that Stanislav Lem published in 1968, he sketches a sort of creative process between the brain of the writer and the paper he is using. It is

> eine Bahn im semantischen Raum. . . . Die "Absicht" liegt gewissermaßen halbwegs zwischen der ständigen "Problematik" des Schriftstellers und dem konkreten "Thema" des Werks. . . . Es geht um gewisse "ständig aktivierte Gradienten," "Pole" im semantischen Raum, sich gewissermaßen kreisförmig wiederholende Prozesse von emotional wirksamen Erinnerungen und Erregungen; das, was die Absicht darstellt und schon den thematischen Keim des Werks bildet, gruppiert sich gewissermaßen um jene Zentren, die bestimmte Inhalte, Beobachtungen, Urteile zu erfassen und teilweise zu ordnen scheinen und ihnen dadurch eine "latente" Geschlossenheit verleihen. (80ff.)

> a track in semantic space. . . . The "purpose" lies, so to speak, halfway between the constant "set of problems" of the writer and the concrete "subject" of the work. . . . It is a question of certain "constantly activated gradients," "poles" in semantic space, in a sense circularly repeating processes of emotionally effective memories and states of agitation; the elements pertaining to the purpose of the work and that already create its thematic core are virtually grouped around those centers that seem to grasp (and in part also to order) certain contents, observations, and judgments, thereby lending them a "latent" closure.

Even if Lem is deducting this description from the comparison of ideas, drafts and finished novels in the sense of a process between an individual person's brain and an environment, one can definitely read it as a current description of the brains connected through computer-based media that continue communicating with the purpose to enter another "second world" which we continue to call "literature" for lack of a more suitably fitting name. The difference to literary communication in printed media consists in the fact that it is not only one person who is writing and the others who are only reading. In computer-mediated communications, the world of simulation starts, and this means that the drafts in which aesthetic intentions are turned into short poetic texts or long

narratives are realized in a still quite unexplored, open and multiple recursive process between "writers" and "readers" whose writing and reading activities often are transformed by "autonomous" programs, "agents," etc.

This essay tries to give a brief outline of our theoretical and methodological approaches for analyzing such changes in *literary* communication triggered by computer-based and networked media. This leads to questions such as: Can we discover a new quality of literariness? What are the terminological and methodological means to examine these literatures? How can we productively link the logics of the play of literary texts and their reception in the reading process? What is the relationship between literary writing and programming? Is there a unique *aesthetic difference* regarding literature in computer-based and net-worked media?

After one hundred years of ongoing avant-garde "revolutions" in the arts, it seems about time to reassess which of all the innovative artistic practices are today interesting only for historians—and which, on the other hand, have had a lasting and enduring effect on contemporary arts. At present, indeed, various elements, structures and procedures of 20th century avant-garde continue to have a strong impact on visual arts, music and, last but not least, literature in computer-based media. For example, Marcel Duchamp's *ready-mades* or William Burroughs' *cut-ups* are apparently being taken up in works such as Noah Wardrip-Fruin's "textual instruments" *News Reader* or *Regime Change.*

But if we do a double take, things turn out to be more complicated: What on the surface seem to be resemblances or analogies of new media art to the modernist tradition are symptoms of a radical change in media technologies whose mid- and long-term consequences we are only beginning to realize. If we approach computer-controlled processes in the context of industrial production from the producer's point of view, we could argue that manual work has been replaced by industrial work and automation technologies. This can also be observed in the arts: Whereas the Cubists and Dadaists had to work with paper, scissors and paste, contemporary artists trust in fast word processing, communications, image editing, graphics, animation and motion tracking software. Tristan Tzara's instruction how to make a Dadaist poem or Burroughs' cut-up poetics—to name only two examples—have turned into cut-and-paste or "StorySprawl" tools, and Mail Art is being succeeded by web logs and wikis. From the point of view of a reader, spectator or listener, we could argue that these tools demand a much higher grade of activity than the coughing, snorting and hawking which John Cage activated in his famous composition *4'33".* As regards the work of art, it seems as if the individual piece with beginning, middle and end had actually vanished from the scene or—to put it more mildly—had been transformed into an open and recursive process between producers, programs, and readers/spectators/listeners.

However, these considerations will not suffice to comprehend the pivotal changes imposed on the arts by the latest developments in information technologies. We would like to suggest thinking about literature in computer-based and networked media from a wider perspective: Many participants, human as well as non-human "actants," collaboratively create structures, forms and patterns that none of them has ever intended to produce—nor have any of them foreseen the horizon, the aim or even the meaning of the emerging phenomena. Literature has always been a medium in which intelligence and stupidity, understanding and misunderstanding, causes and consequences of love and power discourses have been *aesthetically* reflected, i.e., it is this particular *aesthetic difference* which must also be taken into account when art and literary theory turn to analyzing projects in computer-based and networked media. The following considerations introduce some basic ideas, key hypotheses and interim results of our recent research which, under a broader transdisciplinary perspective, aims at analyzing social and cultural changes caused by the dissemination of computer-based and electronically networked communications systems. As regards literature, the moot question is whether a "new" literature is arising, i.e., whether those aesthetic communications in computer-based media that we still regard as "literature" retain the aesthetic difference essential for traditional print literature.

Language, Semiosis and Media

Various methodological approaches have been introduced and different terms have been proposed for many good reasons since literature in computer-based media has attracted the interest of many scholars all over the world. This includes such influential theories as "hypertext" and "hyperfiction" (Bolter; Landow; Suter and Böhler), "E-Poetry" (Glazier), "cybertext" and "ergodic literature" (Aarseth), "interfictions" (Simanowski, *Interfictions*), or "literature in electronic space" (Heibach) and—last but not least—"electronic literature" (Hayles) and "digital literature" (Simanowski, *Digitale Literatur*; Wardrip-Fruin, "Five Elements of Digital Literature"), which have turned out to be sort of umbrella terms.

We, however, prefer *not* to talk of "electronic" or "digital" literature but of "net literature" as an abbreviatory term for "writing in networked and programmable media" (Gendolla and Schäfer).[1] This is not for desperately adding another label for its own sake but because we think that there still is a continuous misunderstanding about both the etymology and meaning of "digital," which has serious consequences for the scholarly discourse. Speaking of "digital literature" is a tautological argument that ignores the peculiarities of

human perception and cognition. By reading a text, human beings only perceive *discrete alphanumeric signifiers,* which could have been encoded in *any* sort of medium previously (Schäfer, "Sprachzeichenprozesse").

We consider the existence of information feedback loops between humans and sign processing machines as the major modification caused by computers in literary communication. Sense or meaning emerges from networked literary processes quite explicitly only through multiple "writing back" or "overwriting" activated textual elements or lines, as Ludwig Jäger has conceptualized it in his theory of recursive transcriptivity for all mediated processes of linguistic signs (29ff.). In local-area as well as in global computer networks every single bit of data can be processed at any point, so that, under the conditions of "permanent mutability" (Chaouli 68), every reading is just a temporary glimpse at a text in flux. The supposed "digitality" of computers, however, does not provide further assistance in explaining these processes. We do also insist that the "digital" should not be confused with binary code and that it is not necessarily tied to computer technologies. For defining the digital, binary coding is contingent, arbitrary, and independent of the medium (Pflüger 66ff.), and we do not need electronics to build a computer.[2] The crucial advantage of the binary code is that it can *easily* be electrified, thus allowing the calculation of every bit-serial, that is to say the processing of signifiers or symbols by programs. It does not need any further explanation here that the computer as a universal programmable machine is not a specific medium in itself but can potentially simulate every other medium. Hence computers are nothing else but temporary programming devices, a processing of a logical machine connected to analog input devices such as keyboards, microphones, mouses, motion sensors, and output devices such as screens, virtual reality environments or mobile phone displays.

Secondly, and this is of equal importance, a literary text has always been the result of digital coding. Literature operates with letters in the basic medium we call language, i.e., it is nothing else but a peculiar combination of discrete, discontinuous and arbitrary signs. It should not be forgotten that the etymological origin of "literature" can be traced back to the Latin *littera* (letter) that initially denoted all kinds of written texts. In a strict sense, it does not make much sense to talk of digital media regarding the storage and transmission of information.

However, we are not pretending that it does not make any difference whether literary texts are stored and transmitted in print or electronic media. That is why we would like to make clear now why we regard the aspect of computer-aided net-operations, the "net" as a multi-source feedback system for literary or other signs as the essential difference to literature in print media. It is not surprising that early discussions of literature in computer-based media

to a large extent were focused on functions and semantics of the printed book. Although this is not in the focus of our interest, we would like to note that the transmission of linguistic signs via electronic networks represents the replacement of the well-established distribution system of the book culture that was based on the printing press and the book market. This position is currently being taken by a system with a completely different structure in which the feedback channel between producer and recipient is in principle open.

As regards literature, this also allows for a fresh perspective on the difference between offline and online projects. What we call "net literature" is not necessarily restricted to the Internet or the World Wide Web—even though the effects we briefly touched on are expanding in the global network in a very literal sense. But in our perspective it is crucial to keep in mind that feedback loops are a basic feature of the stand-alone computer itself as well as of communications of a user with his computer or communications of many users via computer networks.

These recursive transcriptions—and especially the enrichments or losses of meaning occurring there—cannot be fully recorded, let alone understood at present. But notably to the extent to which human sensory channels are linked to electronic sensor technology—and at present this is happening more and more densely and frequently—it is becoming more urgent to understand them better. In the run-up to such terminological and theoretical awareness, already today projects of net literature are reacting; they perceive the short-lived effects as well as the long-lived consequences, the positive and the negative possibilities of these transcriptions.

Thus, the *Assoziations-Blaster* by Alvar C.H. Freude and Dragen Espenschied already since 1999 represents the potentially unlimited possibilities of linking in the World Wide Web by processing the limitless, permanent white noise of the communication currents thereby documenting the pure "being-online-to-participate." But the fact that from the elements of such information currents sense can be generated by using combinatorial procedures poetry already has known since antiquity. Since that time it has always played with these possibilities and has discovered—since the first attempts of the "Stuttgarter Gruppe" ('Stuttgart Group') or the French group Oulipo in the 1960s—computer-aided media as ideal tools for this kind of production. The creation of such elementary sense can be observed by any user of quite simple poetry generators, for example on the *Internet Anagram Server*—and the generators can of course primarily be used by him- or herself (Wordsmith).

Barbara Campbell, who has allowed us to participate in her *1001 Nights Cast,* is also showing how a lasting effect can be gained from the never ending flow of news in the World Wide Web today—in other words, how complete and to-be-continued narratives can be built around the subject "survival-by-

narration" as already did the oldest narratives from *A Thousand and One Nights.* Campbell attempts—analogous to the frame narrative of the oriental collection—to reactivate the motivation for narratives from out of the will to survive of the fictitious narrator (whose husband has died), and thus to reactivate also the thematic fascination for the Orient even under the changed conditions of computer-based and networked communication. Every morning she is looking in the daily papers for current articles on political events in the Middle Eastern countries; she gathers terms or fragments of sentences from them that might contain a generative potential for possible inside narratives in the context of the frame narrative. In other words, they are supposed to serve other authors as stimuli for the contribution of such an interesting and entertaining story that it is able to help the protagonist of the frame story to get over her loss, motivating her to continue her fictitious journey. Campbell presents this fragment on the site as so-called "prompt word/phrase," quasi as an appeal for potential authors to create texts of their own.

This collaborative writing project in principle offers an open entry for narrators of inside narratives or embedded stories within the frame that Campbell has provided as the initiator of the project. In this way, the project "describes" quite literally reflexive and sensory consequences of the novel links between body and spirit with social agents, devices and institutions. Thus, we can ask for the interplay of freedom and constraint, of indeterminateness and determination through formal directives induced as much by technical parameters and temporal constraints as by connections to historical genre conventions and the attribution of social roles. By asking these questions, the project permits *aesthetic* perception as literature always has done.

What then needs to be done in research on literature in computer-based media? In our opinion, two issues need to be given priority: First of all, a theory of literary human-machine communication is to be elaborated, and secondly, such an approach needs to be amended by an aesthetic theory of literature in computer-based and networked media.

Networks and Human-Machine Communication

The creative processes operating between the ideas of writers, the reactions and interventions of users, and the "autonomous" part of the machine have so far been neglected not so much by computer studies but certainly by literary studies. These heterarchical, distributed, and mutual connections between "writers," "works," and "readers" need to be taken into closer consideration.

Computers and networks should not be misunderstood as mere channels for the transmission of messages. In contrast to print media that—generally

speaking—aim at storing and transmitting its input, computers are able to process signifiers according to a program and thus generate an output that can neither be predicted nor kept fully under control by writers or by readers.

We provisionally distinguish three parameters of communication:

- *Human-human communication,* i.e., various people co-operate in computer networks and thus become co-authors of a collaborative work, as, for example, in Claudia Klinger's *Beim Bäcker* ('At the Bakery') or the Austrian installation *Lichtzeile* ('Light Line'). Such *collaborative projects* are rooted in Dadaist and Surrealist cooperative works and in networked collaborative works that have been realized in the respective current communication networks (telephone, fax, radio broadcasting, satellite TV, e-mail, "Minitel," World Wide Web, mobile phones, SMS, etc.).

- *Human-machine communication,* i.e., literary texts that originate from computer-controlled processing of signifiers; the "creativity" is (partly) transferred to the machine in projects such as David Link's *Poetry Machine 1.0* or in the text generators documented in Christopher T. Funkhouser's eminent monograph *Prehistoric Digital Poetry.* Such automatic text generators generate literature by calculating new character strings. This means that the counting with a random number replaces the execution of a literary idea. They have a long previous history in the diverse forms of combinatory poetry experimenting with the fact that the literary text is also determined by technical levels of programming and processes (Schäfer, "Gutenberg Galaxy Revis(it)ed").

- *Human-machine-human-machine-etc. communication:* These are potentially endless collaborations of writers, readers, and computer programs. Before, during, *and* after its production, transmission and reception/consumption this "literature" is affected in many ways by the processing of computers. What traditionally has been called "intersubjectivity" enters into a new dimension when automatic and autonomous transcriptions of intended and realized texts do not only affect their design but also have a strong impact on the meaning of a text, on its semantics. Thus, the environment furnished with electronic sensors and the direct linking of the bodies with networked systems are playfully interacting through or reflecting each other in the different literary projects. The installation *Text Rain* by Camille Utterback and Romy Achituv for example initially disassembles the elements of its own basis, namely the poem by Evan Zimroth "Talk, You" on the difficulties of communication and physical nearness, at the outset dissolving it into letters and words falling from up above with which the viewers then can "play" with their hands, arms,

legs, and the silhouettes of dark objects: they can catch them, gather them, divert them and hold onto them. One could also say: they "read-out" the elements and reconnect them in an altered way into meaningful and sensible or senseless "words," into ephemeral successions of signs that for a short while seem to have "meaning" that, however, can directly dissolve again.

It is our key hypothesis that it cannot definitely be decided *who or what* is at the origin of such a process of signification. This definitely calls the conceptions of "author," "work of art" and "reader" into question—with far-reaching aesthetic but also very severe legal consequences. A work of art or a literary text thus can no longer be regarded as the materialization of a finalized creative process of a gifted person (Rohrhuber). It is just an ephemeral, transitory or mutable stage of a potentially never-ending process of creation, a sort of computer-based *ars combinatoria.*

We thus believe that an enhanced *model of literary human-machine communication* has to be worked out starting from the assumption that there are various layers that mutually influence each other in new media or are influenced by new media. The French theorist and artist Philippe Bootz has already developed initial ideas for such a model. He differentiates the functions of writing, processing and reading:

> From a semiotic point of view, we can separate the classical and general semiotic notion of text (the text is the object of interpretation) into three different parts that do not act in the same space. Program and data (in high-level forms) constitute the *texte-auteur* ("author-text" or "text-of-inscription"). This is a sign that is only accessible by the author. . . . The second sign is constituted by what will be considered as "the text" by the reader. It is the *texte-à-voir* ("text-to-be-seen" or "text-of-visualization"). It is a part of the observable transient event that can differ from a reader to another . . . The physical process itself is a function. From a semiotic point of view, it transforms the *texte-auteur* into the *texte-à-voir.* (93ff.)

Between writing and reading a text, there are various encoding and decoding procedures on distinct human and machine levels, which mutually "read" and "write" onto each other. The role of the arts in general and of literature in particular may be seen in an *aesthetic perception and reflection* of transitions, disturbances, associations between these levels, identifying the crucial junctions of decisions between humans and machines.

For this approach, the definitions and conceptions of "nets" and "networks" are decisive. It is quite useful to realize that the word fields open up

lots of seemingly incompatible definitions from fishing nets to traffic systems, from neural nets to energy supply grids, from soccer goals to spider webs. At first glance, it may not be obvious what all these different sorts of nets may have in common. We thus refer to the philosopher Hartmut Böhme, the sociologist Manuel Castells and the network theorist Albert-László Barabási who—among others—coined very broad definitions, which nonetheless may be helpful. Böhme defines nets as follows:

> *Netze sind biologische oder anthropogen artifizielle Organisationsformen zur Produktion, Distribution und Kommunikation von materiellen und symbolischen Objekten. . . . Netze bilden komplexe zeiträumliche dynamische Systeme. . . . Sie tun dies nach stabilen Prinzipien, doch in instabilen Gleichgewichten, selbstgenerativ, selbststeuernd, selbsterweiternd, also autopoietisch und evolutionär.* (19)

> Nets/networks can be regarded as biological or man-made, artificial organizations for the production, distribution and communication of material and symbolic objects. . . . Nets create complex dynamic systems in time and space. . . . Their bases are stable regularities but instable balances, they are self-generating, self-controlled, and self-expanding, that is to say: they are autopoietical and evolutionary.

According to Castells, a network is a set of interconnected nodes with a node being a point with a curve intersecting itself. This implies that networks are *open* structures that are able to expand beyond all measure and thus integrate new nodes—it does not matter on this general level whether these are brain cells, human beings, machines or societies.

These arguments have two consequences: First of all, they imply that all these nodes must be able to communicate within the network, which means that they either need to share the same communication code or that these codes can be translated into each other (Castells 470f.). That is why networks may be regarded as topological configurations, which are well suited for explaining the increasing complexity of interactions and the emergence of nonpredictable developmental patterns as a result of generic "creative" processes. Secondly, this approach connects the self-organizing dynamics of mental processes with that of computers producing hitherto unpredictable configurations. Computer-based media and electronic networks permit and require an increasingly far-reaching modularization of production processes, which potentially are always under construction. Due to the structural congruence of standalone computers and computer networks—the German media theorist Hartmut Winkler, for example, claims that it is telegraphy which is operating both inside and outside the single computer—(213), the principles of storing, processing and transmitting signifiers potentially expand without any limit.

According to Barabási, networks are generally not random; particular nodes are being favored. They form so-called "hubs," i.e. nodes with an extraordinarily large number of links: "Hubs appear in most large complex networks. . . . They are ubiquitous, a generic building block of our complex, interconnected world" (63). Whenever various elements are connected to networks, the so-called "connectors," i.e., "nodes with an anomalously large number of links" (56), either immediately or gradually develop a strong attraction to energies, to information or to communication. Similar processes are tuning in with one another, enhancing mutual feedbacks, canceling dissimilar processes.[3]

Another corresponding conception has been repeatedly brought forward by the German philosopher Hans Blumenberg, namely that of *simultaneousness*. Blumenberg argues that at any point the most banal and the most important things happen at the same time. The relation between occurrences that we regard as significant and those that we regard as completely insignificant derives only from this simultaneousness. According to Blumenberg, the simultaneity of various major events, minor occurrences and subjective trains of thought amalgamate to a sort of joint "horizon of meaning" (Blumenberg) which is the ultimate pre-condition for any emergence of meaning.

A model that has been intensely developed in the research done on artificial intelligence in recent years and that certainly can be connected to these ideas—namely the so-called *connectionism*, or better the theory of connectionist systems going far beyond the actual AI—is based on the assumption that a multiplicity of heterogeneous but effectively connected units of processing can be networked into a system. Through this networked interconnection, the individual elements permanently influence each other in their functions. It is true that this approach, as far as we can see, cannot yet be directly applied to literary procedures and especially not to the new procedures developed in computer-based networks of literary communication. However, it clearly lends itself as a comprehensive model for the constantly occurring, split-second, automatically coupled or specifically and intentionally planned multimedial and multimodal links between man and machine. We thus think that for working out a revised theory of literature, especially of "net literature," those four conceptions we mentioned should be taken into further consideration:

- attraction in networks ("hubs");

- synchronizations by resonances;

- narratives as means of creating meaning from coincidental actions and occurrences;

- connections of texts, images and sounds as multimodal operations be-
  tween the central nervous system, physical-sensual interfaces and com-
  puters.

Why that? On an abstract level, literature has always been a mode of connect-
ing contingent events to more or less meaningful strings of signifiers—to sto-
ries, poems or drama—or in the words of the French philosopher Paul
Ricœur: to an *intrigue*. It was Ricœur who once drew our attention to the ety-
mological source of "intrigue," which derives from the Latin *intricare*, "tying
things together". Literary texts emerge from connecting or coupling coinci-
dental, simultaneous, similar, etc., occurrences and ideas which seem to hap-
pen by chance to a meaningful chain of events—no matter whether they are
thrilling, tragic, amusing or boring. For doing this, cultures throughout time
invented various literary genres and canonical models which—this has been
the basic idea of all theories of "intertextuality" from Mikhail Bakhtin to Julia
Kristeva and others—eventually constitute the realm of literature as a whole by
interacting through various cultural and media systems.

This is what different approaches of critical theory such as hermeneutics,
systems theory or reader-response theories have in common: There are noth-
ing but signifiers referring to signifiers, symbols referring to symbols, commu-
nications referring to communications—which eventually constitute networks
of texts: of "great" classics as well as of minor adaptations, of pulp fiction as
well as of diaries of amateur writers.

If, however, "writers" *and* literary texts *and* "readers" are connected
through computer-based electronic networks, these theories, formal con-
straints and cultural practices prove to be insufficient and need to be comple-
mented by the physical laws and technical procedures mentioned above:

- attraction of certain themes, motives, and methods simply for reasons of
  accumulation: elements often copied or repeated must be important; text
  generators based on technical linkages create automatic associations or
  completions of net literature;

- effects of synchronizations and resonances during the processing of texts
  in the net, including "net poetry" or "net literature."

This does not immediately lead to great narratives, and the long-awaited "Ulys-
ses of the Internet" is still to come. But we can certainly observe some clus-
terings, some patterns, or some focal points of attention. Under present-day
cultural and technological conditions, there apparently is nothing like a "work
of art" which has been finalized by its creator, a solitary, complete and unique
piece to which nothing can be added or from which nothing can be taken
away. Instead, we can only observe mutable and transitory effects on screens

or other display media: a constantly transforming Web of signifiers that may constitute a *"net-work."*

Aesthetic Difference and Literariness

However, from our point of view, such a theory of communication cannot be regarded as a sufficient theoretical model for describing the peculiarities of the *literary* system. As literature in general can be regarded as a medium of *testing action* of interactions and its consequences, it should be worthwhile to apply *aesthetic criteria* to literary human-machine communications in networked media. From this point of view, literature has been a medium of *virtual realities* long before modern computer technologies developed. The alphabetic script, i.e., discrete and alphanumeric code, has proved to be the most successful medium of storing, processing and transmitting information in/from the human mind to storage devices such as stone, wood, papyrus, leather or paper to date. If we regard literature as a sort of meta-medium, a commentary to the consequences of the exteriorization of imagination and ideas by producing an alternative reality, the specific *literariness* of texts needs to be put at the center of attention of research. In our opinion, in most studies this has not been done so far: This even applies to such important books like Espen Aarseth's seminal study *Cybertext* or Christiane Heibach's *Literatur im elektronischen Raum* [*Literature in Electronic Space*] which claims to focus on what she calls "Sprachkunst" ('art of language') in its varying medial surroundings but avoids any answer to the crucial question whether there is a unique *aesthetic difference* regarding literature in computer-based and networked media.

In order to illustrate what is meant by *aesthetic difference* let us return to Utterback and Achituv's *Text Rain*: The poem by Evan Zimroth as the basis of the installation talks of the wish for communication, and in a literal sense: as a wish of the body transferred into speech, into words:

> I like talking with you,
>   simply that: *conversing*,
> . . .
> At your turning,
> each part of my body turns to verb.

And it is just that which is declared impossible in the poem, a turning into nothingness, empty chatter:

. . . we are synonyms
for limbs' loosening of syntax,
and yet turn to nothing:
It's just talk. (40)

Here, from the conflict between the writing surface and imagination, between the two-dimensional medium of letters on a surface—on the page of the book, the monitor or the projection screen—and the multidimensional imaginative realm of the reader, develops *aesthetic difference.* This conflict, indissoluble in the traditional space of the medium book now, in the three-dimensional space of the installation is solved in a quite specific way by returning the words back to the bodies. However, the conflict on this level is also renewed: The body or the bodies may move as they like; they are unable to reassemble the poem *as a whole. Aesthetic difference* as a perceptional conflict or tension between the senses and sense in this installation has been transcribed into the electronic-organic coupling.

What then are the methodological consequences for research in net literature? First of all, the established theories of literature such as hermeneutics, formalism, reader-response theory, systems or discourse theories need to be critically reviewed. How do they conceptualize literariness? What do they regard as specific aesthetic qualities of texts? Are any of their key terms and conceptions such as "defamiliarization" (Shklovsky), "horizon of expectation" and "aesthetic experience" (Jauß), "gaps" and "implied reader" (Iser), "interdiscourse" (Jürgen Link), "autopoiesis" and "communication" (Luhmann), and so on relevant for analyzing "net literature?"

The question remains whether a radically new literary quality is developing: Is it possible to amalgamate the openness of networked communications with the claims of traditional aesthetic theories for perfection, consistency and harmony of finalized texts or works of art? Texts in computer networks can only be described as transitory effects of human-machine-human-etc.-communication. Consequently, we argue that the reassessment of some important epistemological and aesthetic categories may provide a theoretical foundation for the key question about the specific aesthetic qualities of literature under the conditions of permanent mutability of signifiers.

- *Intentionality vs. chance:* How do intentional actions of the persons involved—particularly those of writers—coincide with computer-based chance operations? How can the consequences for traditional conceptions of "authorship" be described? Unlike print literature, the initial and intentional idea of the author—for example Umberto Eco's desire of "poisoning a monk" (509) when he wrote *The Name of the Rose*—is being refracted or transformed by both human and machine "agents" in net

literature. It is only effective in particular time segments, for example when an author lays down his initial idea or when some other participants are actively contributing to the text; in other time segments, computer programs are "writing." Hence every primordial intention is being split up spatially as well as temporally: It does not emanate from one exceptionally talented mind but is being agglomerated step by step from recursive processes between minds and computers.

- *Performativity/performance:* How can the relations between the hidden processing of algorithms and the performance of transitory texts on various interfaces be described? This hidden processing can only be perceived—and then be manipulated—when its output (as pixels, sound waves, touch or smell signals) is projected onto various interfaces. There is nothing like the progression from manuscript to the printed book but writing itself becomes performative, and this performance is in part defined by software (Kamphusmann).

- *Emergence*: How can the shift of the emergence (of meaning), which once used to be an element of text alone, be described as something that now is generated in processes between human and machine agents? The emerging meaning can no longer be regarded as part of the finished work of art, but it is generated in recursive actions between writer(s), readers and computers.

- *Game/Play:* Does it make any sense to examine new forms of "net literature" using terminologies and concepts of various theories of play? It may be helpful to analyze all those new forms, procedures and objects that become manifest in net literature by taking up the new approaches of game studies and ludology.

The specific "virtuality" of literature has never been primarily dependent on its relation to nature, society, etc., but above all on its *self-reflective relation to the literary tradition* (this may be called first-order virtuality). In computer-based and networked media, literary forms have emerged that can no longer be produced, stored or transmitted by traditional materials and media. It is only these forms that now could be called "virtual" with some validity. In terms of "virtuality," these forms then would allow for forms of second- or third-order virtuality—or even virtualities of n-dimensional order corresponding to the grade of explicit or implicit self-reflectivity.

A prominent example of *first-order virtuality* can be seen in Cervantes' *Don Quijote* who is continuously virtualizing knightly romances. American and European Literature of the 19th and 20th century continued with these procedures of reflexivity by inventing metaphors, introducing the montage of ad-

vertising materials in Alfred Döblin's *Berlin Alexanderplatz* or by using "stream of consciousness" in James Joyce's *Ulysses*.

By playing with functional or mechanized communications net literature on the one hand assembles an aesthetic difference—that is to say a difference in the perception of our world. On the other hand, media technologies are giving important impulses in the evolution of literature, and only in the interplay of that difference and these media technologies are the literary forms emerging. We would like to distinguish this essential virtuality—i.e., the first-order virtuality—from procedures of virtualization of the second, third or n^{th} order.

A first, rather simple example for *higher-order virtuality* is a text adventure like Thomas Holz' *Murder Without Escape,* which on the one hand is a murder mystery, while on the other is a game using elements and modules of crime stories (crime, murderer, victim, rooms, trails, circumstantial evidence and so on). The key issue for our argument is that the *implicit* mental position of crime stories—the (murderous) imagination of the reader—is turned into an *explicit* combination of reading and acting: into reading, clicking and, potentially, writing.

Narrative Models and Story Elements: An Exemplary Case Study

Processes or "works" of net literature fundamentally pose all those questions once more that can be asked of printed texts as well. Therefore, the comparison to book-literature promises to provide interesting information on continuities and discontinuities. Given that a migration of literary forms from printed texts into computer-aided media apparently is taking place, there must be invariant structures that only enable us to speak of "literature" as a single field. Our assumption is that the semantics of literary concepts therefore need be more durable than the pragmatics of communicative acts. Among those concepts, literary genres still play an important role since they reflect core aspects of literariness. For reasons of space we would like to illustrate this with an example of only one narrative genre, namely crime fiction, which continues to be popular to this day—maybe because it is structured in a comparatively conventional way.[4] As common features between crime fiction in books and computer-based media we can note three basic elements that, according to Ulrich Schulz-Buschhaus, can be identified in all crime novels, films, TV drama, hyperfictions or computer games:

1. *Mystery:* In the beginning, there always is a mystery that the detective has to solve during the course of his investigation. It is both the precondi-

tion *and* the continuing antinomy of the detective's investigation that eventually lead to a—usually unexpected and surprising—solution of the case and to the revelation of the culprit.

2.   *Analysis:* The reader competes with the detective in making observations, analyzing the testimonies of witnesses and suspects, assessing evidence, setting up hypotheses, and so on.

3.   *Action:* This category describes the plot of the story; it covers all the narrative elements such as the committing of the crime itself, the detection, the escape and chase of suspects, and so on (Schulz-Buschhaus 3).

At the beginning of *A Scandal in Bohemia* (1891), the first ever Sherlock Holmes story, the detective is described as "the most perfect reasoning and observing machine" (Doyle 1). His systematic investigation of the crime competes against the criminal's strategy of obscuration that allows the reader to draw conclusions about his intentions. These mutually determining strategies constitute a narrative model in which—due to the antinomy of revelation and obscuration—*visibility* serves as a fundamental structural principle. Every criminal action leaves a number of clues at the crime scene. The detective thus has to be attentive for the most ephemeral, heterogeneous and disparate clues—in particular small or even microscopic objects such as hair, blood spots, fingerprints, ashes or DNA traces. According to K. Ludwig Pfeiffer, the investigative work thus requires a "semiotische Empirisierung der imaginativen Analyse" ('semiotic empiricizing of the imaginative analysis') (251). It is based upon the interpretation of indexical signs in order to recover the existential link between the signifier, the signified and the referent, which is the starting point for uncovering hidden connections and for reconstructing the chain of events.

The pleasure of reading such a novel derives from its *hysteron-proteron-*structure, a particular reversal of the chronological order: Since the detective who is gathering evidence and fitting them to his hypotheses advances into the past in order to examine the interplay of causes and effects which led to the crime, the initial event—the criminal action—is only told in detail at the end of the story. Whereas the plot of an adventure story is arranged on a narrative trajectory in the temporal order of *events,* the plot of a crime story follows the order of *discoveries.*

In our context, the crucial question arises whether this specific tension in crime fiction can be transferred to computer-based media. Is there any equivalent to the narrative trajectory of traditional crime novels in print media? Do hypertext fictions and games, in which the plot is separated into a multitude of narrative threads, also satisfy the criterion of narrative coherence? Have the

elements of "mystery," "analysis" and "action" survived the transferral into a different media dispositive? If yes, then how have their interrelationships changed?

Using crime fiction, it therefore is possible to illustrate our thesis that computer-based media demand an explicitly active engagement with the plot of narratives. This again points to the question to what extent *games* are "narrative"—and on the other hand, to what extent *stories* can be playful. If the "narrativity of games is not an end in itself but a means toward a goal" (Ryan 349), we have to be aware of the latent conflict between the writer's or game designer's aim to preserve narrative coherence and the reader/player's desire for *interactivity*.

This indicates a crucial difference between detective stories in books and those in net literature or in computer games: In crime fiction, all the necessary clues have to be revealed but, at the same time, the mystery has to be strictly preserved until the end of the story in order to sustain the suspense. While the coherence of the story and the complete process of induction, abduction, and deduction remain under the author's control, in games as well as in net literature, however, the solving of the mystery has to be subdivided into a series of minor challenges which the reader/player has to pass one by one in order to advance.

This leads us back to our introductory assumptions that, firstly, applying narratives to computer-based media increasingly requires a *modularization* of processes, and that, secondly, the *implicit* mental position of crime stories is turned into an *explicit* combination of *perceiving and acting.* In games and in net literature, the detective's investigation has to be realized as a *series of solvable problems.* The entire case thus is subdivided into a number of autonomous missions that have to be completed in a successive order. The key question is whether—as a result of this modularization—there is a general and unavoidable tendency to prematurely unravel the mystery—or at least to reveal important clues too early. If this in principle is the case, this raises the further question whether there are strategies to compensate for this loss of narrative coherence, and, if yes, by which means either an equivalent or a different form of narrative trajectory can be implemented.

On the *pragmatic* level, the analysis centers on the user participation, i.e., on *interactivity* and *reactivity.* We consider readers/players' actions as *hybrids* of both narrative and playful moments. This can paradigmatically be seen in *mystery games,* which have adapted the motives and devices of crime fiction to computer-based media. According to Ryan,

> this genre allows greater narrative sophistication than the others because it connects two narrative levels: one constituted by the actions

of users, as they wander through the fictional world in search for clues, and the other by the story to be reconstructed. Since the story on this second level is independent of the actions of users, it can be as fully controlled by the author/designer as the plot of a novel. (352)

If the story emerges as an output of a series of readers/players' actions, the *abductive* process of evaluating clues and of developing hypotheses about what has really happened stimulates the reader/player's imagination in a very similar way to that of the reader of a novel. The suspense is maintained by "the taking together of both past and future horizons, which consciousness spans" (Rankin 4), or, in the terms coined by Husserl and Ricœur: by "*retention*" and "*protention.*" In both stories and games, readers or players organize events into successions by reassessing their past experiences and hypotheses and by looking forward to possible future developments.

The deductive element of the detective's method, however, which, in print media, is to provide a surprising solution of a case only at the end of a story, has in principle been maintained in computer-based media—but with far-reaching modifications. In games and net literature, the mystery is unraveled if—and *only if!*—the readers/players' actions, which have been inspired by their imaginative analysis in the course of the reception, turn out to be in accordance with pre-scripted solutions that have been programmed by the game designers and implemented into the rules and computer operations. There is no way for the reader/player to keep up the suspense without constantly surmounting challenges, i.e., without complementing the imaginary activity of perceiving what is happening on the screen with explicit actions such as, for example, choosing between different links in a hypertext fiction or by controlling an avatar in a virtual world.

In the computer game *Sherlock Holmes: The Case of the Silver Earring*, which is full of allusions to the long tradition of Sherlock Holmes novels and movies, players are strongly encouraged not to miss out on any of the dialogue options, because these interrogations give meaningful evidence, and because—which, at some point is even more significant—sometimes talking about one subject opens up possibilities for others. Of core importance is Holmes' notebook in which, most importantly, all the testimonies of the characters in the game the player (as Holmes or Watson, his assistant) has spoken to, as well as the reports and documents such as newspaper clippings, postcards, pictures, etc., that have been uncovered, are collected. Hence, everything the player needs in order to solve the mystery is gathered in the inventory in the course of the investigation.

It is of eminent importance not to neglect any object or testimony, because otherwise it is impossible to advance to the next level of the game. Thus,

even the minutest clue has to be discovered and all interrogations have to be conducted before Holmes and Watson note that all their tasks on this day of their investigation, i.e., on this particular game level, have successfully been performed and that it is about time to return to their quarters. The return to their lodgings always indicates that the player has to take a *quiz*, in which s/he has to answer "yes" or "no" to each question and to provide evidence from the notebook to justify the answers given. Hence the deduction, the third and last element of the detective's method, is implemented into an abstract game in which success depends on correctly answering questions.

Most notably, *The Case of the Silver Earring*, like mystery games in general, is a "progression game," but its hybridization with both "emergence game" elements and narrative cut-scenes helps to resolve the paradoxical relationship of narrative and game elements. On the one hand, there is always a link between playtime and fictional time in games, which Juul described as "projection": "Projection means that the player's time and actions are projected onto the game world where they take on a fictional meaning" (143). The chronology of the fictional time must be strictly respected in games, because both flash-forwards and flashbacks in interactive media would inevitably end up in the paradoxical situation that player's actions on one time level may render the fictional world on another time level impossible. On the other hand, the narrated story often requires different time levels. Therefore, two strategies of correlating different time levels are applied in the game: Firstly, the player only gets to the next level if he/she has correctly answered all the quiz questions—in other words, Sherlock Holmes can only carry on with his investigations on the following day if the player has succeeded in the quiz game. Secondly, the narrative coherence of the mystery game can only be controlled if additional information about the fictional world is again and again introduced to the player.

Frank Klötgen's hyperfiction *Spätwinterhitze* demonstrates that it is by no means simple to create the agonal tension of crime fiction while at the same time opening up interactive possibilities. The reader neither has many opportunities to influence the progression of the story by deciding for multivariant plot lines, nor is he authorized to actively contribute to the story. In most parts of the story, he can only click from one link to the other, from "footprint" to "footprint"—in a literal sense the "footprints" are links to the following point of the story—and thus come across one clue after the other. Having in mind that there is a conflict between the reader's desire for narrative coherence and the permanent mutability of signifiers in computer-based media, Klötgen may have been aware that

> it is simply not possible to construct a coherent story out of every permutation of a set of textual fragments, because fragments are

> implicitly ordered by relations of presupposition, material causality, psychological motivation, and temporal sequence. (Ryan 341)

There are only a few points that permit a certain degree of interactivity: At one point, the reader has to choose—in a multiple-choice test with pre-scripted answers—between different options in order to get on with the investigation. At this point, the interplay of abduction and deduction is implemented into a combination game that assesses the reader's comprehension of the story up to this point. He can only read on after having opted for the right combination of statements, which is only possible if the reader has followed the development of the story very carefully and has remembered the key situations (of course, he/she can also solve the puzzle by testing all possible combinations). At this point, *Spätwinterhitze* offers something like the nucleus of an "interactive narrative." It points at the crucial difference between reading a detective story in a book and "reading" it from a multimedia device: The imaginary tension between expectation and disappointment is disturbed or disrupted by the game features; the imaginary theater of the reader/detective is interrupted by the action of the player and his "agent." Therefore, the tension oscillates between the reader's reflections and his actions, so that the imaginary rapture of the reader and the player's immersion into the virtual world pale in comparison to his agency if linear narrative and interactive game features are brought together in one moment/situation.

If we regard literature as a specific mode of perception, as a sort of explicit "interface" for conflicts between an individual's subjective desires and social demands, in particular between the subjective and the collective unconscious, then media technologies add a sort of "technological unconscious," the forms and structures of which always have to be taken into consideration. In computer-based and networked media, code, scripts and programs represent the "technological unconscious." The complex feedback loops between individuals, society and technology are being reflected in net literature—ranging from consciously controlled to random processes.

Jean-Pierre Balpe's interactive and generative crime novel *Trajectoires* may serve as an example for the impact of algorithmic text generation on literary genres. It starts with a plot identical for every reader: On August 1st, 2009, in the region of Gâtinais, 24 persons receive an anonymous e-mail. Who is the "Raven" threatening to kill them? What is the difference between the psychological terror that he inflicts today and the political terror of 1793? The singularity of Balpe's project is based on the fact that it allows combining not just text, sound, pictures—stills as well as moving pictures—or interactive programs, but also computer codes (which are an integral part of the piece) for creating computer-aided literature.

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Trajectoires could have been a perfect example for supporting our assumption insofar as Balpe does not only confront the mail recipients'—and the reader's—subjective desire to survive the threat with collective social restrictions (which Balpe calls the "sous-univers" ('sub-universe'))—the intimidating power of terror in this case—but, in addition, these conflicts are technologically organized by computer software. Although this program can be influenced to a certain degree by the reader, s/he constantly has to cope with the arbitrary output of the text-generating computer.

Therefore, the emphasis is on "*could* have been:" although Balpe claims his piece to be a crime or terror story, he does not observe the rules of the genres. In particular, he disregards the requirement to carefully intensify and dissipate suspense by foreshadowing, postponing or misdirecting possible outcomes (what we earlier described as interplay of "protention" and "retention"). Instead, *Trajectoires* only offers variations of the same basic patterns that all too soon make reading and intervening rather boring—just like a game of dice without any chance of winning.

In contrast to Balpe's assertion, the reader does *not* become an essential element of this fiction because there are too many variations possible between random and intentional operations. Balpe argues as follows:

> The narrative is not totally built in advance but put together from a variety of virtualities that are—or are not—actualizing themselves in the course of reading. This reading is then fundamental and tends to substitute itself to the diegetic axis. Each new reading—actualizing the narrative in a new way, built on what I call micro-fictions—creates its own diegesis, which is not a predetermined but an undetermined diegetic axis. This really means: Any reader A needs to develop a unique hypothesis giving him an idea of the narrative that is different from that of any reader B. . . . One novel can thus be constituted by one or an infinite number of texts and no reader reads the same number of texts. There is no structure of the narrative, only an idea of a virtual one built by the reading itself. ("Principles and Processes" 313)

This, however, is contrary to the genre conventions of crime fiction. An imagination that creates nothing but variations cannot be held together by a larger narrative trajectory. It only provides opportunities to make free *associations,* but it certainly does not create anything like a narrative *reality.* Therefore, Balpe's idea that "generative literature's only pretension is to enrich the text's potentialities" (315) is too vague: Literature can only be expanded if it is *constrained* at the same time, as regards stylistic or plot variations.

When asked in an interview how the reader should cope with the possibility of not finding the same clues again if he/she returns to the same page for a

second time, Balpe argues: "Exactement comme si vous étiez un policier! Vous avez rencontré une concierge, elle vous a dit quelque chose, vous la rencontrez trois heures après, elle ne vous dira pas la même chose. . . ." ('Exactly as if you were a cop! You met a concierge who told you something, you see her again three hours later and she no longer tells you the same thing. . . .') (qtd. in Sadin). This may reflect the everyday working situation of detectives and policemen. The narrative trajectory of the detective novel, however, tends to follow a strictly defined pattern that is being narrated in reversed temporal order. *Trajectoires* would be a good example of narrative in computer-based media,

- if Balpe would have integrated the modules of the story into a narrative trajectory, at least a game-like one which is subdivided into various segments or a fragmentary one, for example one in which modules 1 to 24 are indispensable;

- if the text generator would be able to do more than just produce impressions or descriptions, namely *tell a story*—and this would necessarily require an intelligence that could anticipate and construct a story with an end in mind;

- or, if the reader could collaborate with the text generator in producing her or his own narration. In this case, however, the generator would be nothing but a sort of creative-writing tool.

Instead, the text/image generator enables the reader/user to generate lots of varying descriptions of characters, settings and situations that offer a vivid impression of the intimidating terrorist atmosphere—but it certainly is not what it claims to be: an interactive networked *crime* story. Markku Eskelinen, however, has imagined further new subgenres of crime fiction, for example stories whose genre or mode will change "based on how the text is being read—let's say the faster you read a detective story the faster it becomes a horror story to slow you down with gruesome details" (189), or a detective story may be turned "into a hypertext and boost its epistemological structures with conditional links, hiding the evidence so to speak, and then turn this ergodically static hypertext into an ergodically dynamic cybertext that after a certain time starts playing with both its own and its users' time and begins to destroy its static scriptons, that is, its very evidence" (191).

Conclusion

The examples discussed here for reasons of space were only able to give a brief overview of the questions with regard to literatures in computer-based media.

A lot of in-depth studies of net literature need to be conducted before our initial questions whether there is a "new" literature emerging and what this literature tells us about the state and the future of our societies will be satisfyingly answered. The first question can certainly be affirmed by now; the second question, however, whether this aesthetic reflection allows us to forecast how societies whose members are connected via computer networks will develop, whether their collaborations will eventually result in a state that deserves to be described as swarm intelligence rather than swarm stupidity, remains to be seen.

Translated by Brigitte Pichon and Dorian Rudnytsky

Notes

1   Our reserve against the aforementioned terms coincide with those that John Cayley as one of the most important writers, programmers and scholars in the international "electronic literature" community has formulated: "When I scratched around for a name to describe what I had been doing and continue to do, I rejected or badly needed to qualify those terms that had begun to circulate—hypertext, cybertext, hyperpoetry, cyberpoetry, elit(erature), epoetry, etc.—as either meaningless or misdirected. I still refer to what I do as 'writing in networked and programmable media' and I baulk at shortening this to electronic or digital writing. . . . Despite their association with a particular moment in cultural history, the 'new' of new media, the 'hyper' and 'cyber', the 'digital' and 'electronic', all these prefixes and the characterisations they encourage have the effect of removing history and locatedness. They substitute a fixation with the de-historicised 'new' and an over-emphasis on delivery media-as-technology that overwhelms the determinations of formal and compositional technique." (605).

2   As Florian Cramer once put it, "computers can be built from broomsticks—and computer networks via shoestrings or bongo drums—if digital data, including executable algorithms, can be printed in books and read from them back into machines or, alternatively, executed in the mind of the reader, there is no reason why computer network poetry couldn't or shouldn't be printed as well in books" (267-269).

3   Such resonances and synchronizations have been traced by Michel Foucault in the chapter "The Four Similitudes" of his *The Order of Things*. It has been said that such pre-modern ways of thinking have prevailed in

most cultures, and that they may be a sort of blueprint for theories of aesthetics as sensory perception, as a sort of interpretation or counter-movement against pure rationalism.

4   Our considerations on continuities and discontinuities in poetry and drama have been published elsewhere. (Gendolla; Schäfer, "Looking Behind the Façade").

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