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"Back to the Roots": The 10th ACM Hypertext Conference Met in Darmstadt

By Bernd Wingert

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1. Darmstadt, February 1999

Darmstadt, a city with more than a fair share of scientific institutions, ought to be used to international conferences. Accordingly, it would not really be worth mentioning that the ACM Hypertext Conference was held on the premises of the Darmstadt Technical University on February 21-25, 1999. However, that it happened to be the 10th meeting, and thus an anniversary event (with the subtitle, "Returning to our Diverse Roots," indicated above), may be worth referring too, after all, and is possibly due to the commitment of the local organizer who was in the conference chair this time (Jörk Haake), as well as to the institution with which he is affiliated (IPSI).

Anybody even remotely familiar with the history of hypertext remembers the famous inaugurating conference held in the United States, at Chapel Hill, N.C., in 1987. Why, then, is it that the 10th conference was held in 1999? It is the consequence of an earlier arrangement about alternating between the United States of America and Europe in holding one conference annually. There was no conference in 1988, then the first "ECHT" (European Conference on Hypertext) held in Versailles in 1990 was not organized by ACM, and thus does not count, and the '95 conference was organized one year later, i.e. in 1996. Next year, San Antonio in the USA will have the honor again to host the meeting, as it did in 1991 (see http://ht00.org/).

2. Program Survey

The conference was quite well attended with 170 registered participants; 115 papers were submitted and evaluated in a sophisticated assessment procedure.

The program, finally, contained 19 long and 14 short papers, the latter ones arranged under the more or less customary headings, broken down into two parallel trains and arranged in the following groups of subjects (the papers heard by the author will be marked by *asterisks*): The introductory lecture on the first morning was followed by *Discovering and Generating Structure,* and "Open Hypermedia Systems and CSCW;" in the afternoon, there was a panel discussion about *Writers and Designers: Crossing the Chasm,* which was paralleled by the first section of "Navigation and Visualization," the second part of which followed the next afternoon. This time, the "posters and demonstrations" were properly integrated into the conference agenda, and nobody had to spend their breaks trying to catch a glimpse of these events. On the first afternoon, there was also a short presentation of more or less artistic "hyperfiction" titled *Hypertext Readings.*

On the second conference day (Wednesday, February 24, 1999), the prize-winning papers were read in the plenary: The "Engelbart Best Paper Award" went to Frank M. Shipman (one of the organizers in San Antonio) together with Catherine C. Marshall and Mark LeMere, while the "Nelson Newcomer Award," which was given for the first time, was won by Jill Walker with a reading analysis of "Afternoon" (to be referred to later). In the late morning, this reviewer again preferred a panel discussion, this one on *Adaptive Hypermedia,* to the parallel event about "WWW and Open Hypermedia Systems." In the afternoon, the reviewer was attracted by *Hyperreading,* which was no course in high-speed reading, as the innocent visitor tired of the frequent "hyper-connections" might have guessed in a subversive mood; instead, the subject was interactive fiction. Two parallel papers about "Interoperability between Hypermedia Systems" and on hypermedia in industry were summarized as "Technical Briefings". In the late afternoon, this was followed by "Models, Development and Assessment," and by the second section, referred to above, about *Navigation* which this reviewer attended. Prior to the evening buffet dinner in the corridors of the auditorium building, the awards were given in a ceremony, inclusive of a video presence (which, strictly speaking, is no "virtual" presence) of Ted Nelson sent from Japan.

The half conference day on Thursday was introduced by two parallel sections about *Hypertext Writing* and "Multimedia" before Robert Cailliau commented upon the development of the web, which had been far from straight, having begun at CERN. This review will mainly refer to the sessions the author of this review attended, but also to the "Doctoral Consortium," which he did not attend, but whose position papers are available on the server of the moderator, Peter Nürnberg (Aarhus); a short publication is said to be planned). Six of the thirteen contributions to the "Doctoral Consortium" again dealt with hyperfiction. Reading hypertext and hypertext-based literature has become an important topic and will be one of the focal points in this review. These contributions, focusing on reading and literature, will be summarized in a separate block out of their chronological order.

It is a characteristic of the "hypertext community" that it still comprises very different disciplines and competences, from systems architects to programmers to philologists and linguists and to artist writers or designers.

3. The Introduction

Mark Bernstein, for more than sixteen years Chief Scientist with Eastgate Systems in Watertown, MA, had the honor to open the anniversary congress. Uffe K. Wiil introduced him as the person who had attended all previous hypertext conferences except for the first one in 1987. Mark Bernstein had the difficult job of introducing into the congress and setting the mood by presenting a lecture rich, sometimes too rich, in graphical and pictorial illustrations in which tribute was also paid to the genius loci by again and again adding decorations and figures of "Jugendstil" to a number of transparencies, and by once elegantly correcting "Jugendstyle" to "Jugendstil." Of course, this wealth of graphic elements, quotations, titles of books, poster texts, four characters acting out roles and voicing concerns, an interjected video of a newscast in the year 2259 etc. demanded at lot of the audience, for you can either absorb a quotation, admire a picture, or listen to the speaker but not do all this at the same time. It is a difficult job for a reviewer to filter out of these quotations, arguments and points of view something we have come to refer to as the message.

In my impression, the presentation was most captivating in the middle section, if you agree, the section about media theory, in which the author wondered where hypertext could find a suitable place in the competition of media, for it is not movie (which is a mass medium with expensive technology), nor is it book ("hypertext doesn't like the book channel"), nor is it computer games or free-of-charge informationware distributed to anybody interested at no cost, outside the economic distribution and utilization system ("a world of literary beggars"). But what then is hypertext? "Why is hypertext so unhappy?" Why are many authors reluctant to publish under the hypertext label? Because this is not a hallmark of literature ("the cachet of the novel")? The message probably ran like this: "We can and must build a new literary world!"

Anniversaries produce their own logic of argumentation, and it was obvious for Bernstein to extend the seven issues Frank Halasz' had presented at the '87 conference, after the presentation of "Note Cards," by adding his "eight open issues," which the reviewer would like to add without paraphrasing them as they will largely be self-explanatory: "Visualization: seeing and manipulating structure; enactment: seeing and manipulating dynamics; collaboration, graffiti, component systems; log analysis and user models; tension and excitement; real criticism of real hypertexts;

reactive hypertexts; spread the word" - meaning "go ahead and tell the people what hypertext means," and: "Write hypertexts!" According to Mark Bernstein, this request is still as topical in 1999 as it was many years ago at the San Antonio, Texas, conference in 1991 where Bernstein, in a joint paper with Bolter, Joyce, and Elli Mylonas, asked: "Where are the hypertexts?" (cf.op.cit., p. 256). Thus ran the title of his introductory paper.

4. Generating Structures

The first section of the conference attended by the reviewer was devoted to "Discovering and Generating Structure." The first contribution written by a team of authors and presented by Hermann Kaindl (Siemens, Vienna) dealt with the problem of generating glossary links in a semi-automatic mode; this approach was developed in the context of "requirements engineering." Especially in large collections of text and glossaries, respectively, purely manual production of these glossary branches may mean a lot of work. In their approach, the authors had to decide in favor of developing either a fully automated procedure, which can be very expensive and, given the sophistication of linguistic expressions, also very dangerous, or a semi-automatic approach in which the final decision lies with the user. The algorithm developed was tested with existing glossaries (among them an earlier glossary about artificial intelligence published by the author of the paper) and is said to have produced satisfactory results.

The second contribution came from the University of Kobe in Japan, which offers an extensive WWW site (more than 800 pages) which, in this case, served as a test case, and on which Keishi Tajima presented a couple of ideas and results. A web page can be reached in three ways, namely via the URL, a cross reference, and with the help of a search engine. Now, if the Database Group of the university mentioned above maintains a list of publications appearing as a "Publication List" at a lower hierarchical level (if it is known to belong to the Database Group), then the corresponding web site does not contain this added contextual information (the "Publication List" had better be called "University Kobe/Database Group/Publication List"). If the authors wrote their pages in line with this hierarchical pattern, the additional information may be contained in a path which a user may never find. Consequently, a method was developed in which the individual web sites are returned such additional information (contained in the path via the entry page). A test on the reviewer's server discovered nearly 80% of these entrance links.

In a first short contribution, Göschka and Falb (University of Vienna, Institute for Computer Technology) combined database technology and WWW technology in a new approach. In another short contribution by Alexander Mehler (University of

Trier) the question was examined how hypertexts could be generated automatically from conventional texts derived from various sources, and how cohesion of the parts linked in this way could be measured. For this purpose, the author suggested an "extended semantic space model." In the opinion of the speaker, the problem of automatically generating hypertext was still unsolved and worthy of research, although he did not overlook that normal texts as well as hypertexts may be perceived and interpreted differently, depending on the situational context.

5. Three Panel Discussions

David B. Lowe (Sydney) and Deena Larsen (hypertext author, USA) moderated a panel discussion about "Writers and Designers: Crossing the Chasm." Anybody who has worked with designers in an interdisciplinary development project knows that this cooperation may be full of tension and deep chasms.[1] Undoubtedly, the subject incorporates a problem to which attention at the ACM conference may have been drawn as a result of the discussions in the corresponding workshops run by the "open systems people," on the one hand, and the "writers and authors," on the other hand.

The moderators had invented a fancy framework for their panel discussion: In a scenario developed step by step (which began with the British government launching a major project of translating Shakespeare's works into hypertext), the panelists were to comment on various aspects of mutual blockages of communication and factual problems of cooperation (Mark Bernstein; Wendy Hall; Paolo Paolini; Susana Pajares Tosca, and Lawrence Clark). And while the discussion was still going on, Deena Larsen, the skilled author she is, had included the most important arguments in "storyspace" right away. All this was indicative of an interesting script, but the performance strayed off the mark and, unfortunately, turned out to be a case of Shakespeare's "Much Ado about Nothing," a real pity. Perhaps Bernstein was right in his introductory remark that the basic idea of the project, to fabricate a hypertext out of Shakespeare's works, was wrong. It was an intervention from the plenary (Jill Walker) which recalled the power games usually going on in such projects. The upshot of it is that this piece should be staged again, but differently.

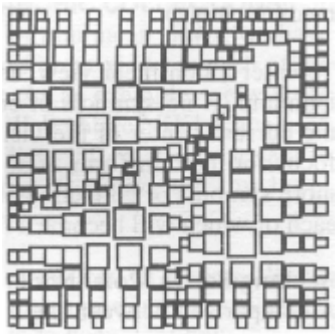
The second panel discussion attended by this reviewer on Wednesday was devoted to the subject of adaptive hypertexts: "Adaptive Hypermedia: Purpose, Methods and Techniques," and was moderated by Paul DeBra (Eindhoven) and Peter Brusilovsky (Carnegie Mellen). The panelists were Alfred Kobsa (GMD), John Eklund (Sydney), and Wendy Hall (Southampton). They all work with or about adaptive hypermedia systems, which made the discussion less of a dispute and more of a stocktaking

exercise trying to find out how adaptiveness can be produced (e.g. either at the links or in the contents) and what are the effects. As this reviewer is not an expert in this field, he is unable to judge the state of the art. However, if one considers the length of time for which adaptiveness has been discussed especially under the heading of learning software, the impression is bound to be that progress occurs at a snail's pace also in this case. This may very well be due to thinking habits. Thus, Mark Bernstein pointed out that authors would hardly make use of the possibility, inherent in "Storyspace," to work with conditioned pathways.

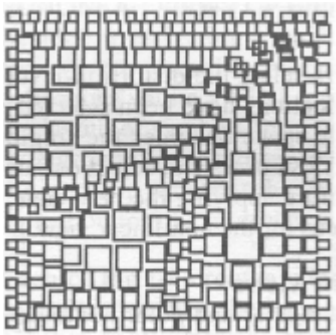
Another panel discussion, on Thursday morning, should be mentioned at this point. It dealt with "Heresies and Reformations: Hypertext Writing Outside the Lines," and was moderated by Jim Rosenberg, who is a hypertext author offering some samples of his most recent work in the "Hypertext Readings" on Tuesday afternoon and who opened with a statement by Wendy Morgan (of the section called "Hyperreading," which will be referred to below): "We have to be suspicious of our own stories." Accordingly, the panelists did raise a few rather critical points about hypertext, as did Susana Pajares Tosca when she inquired whether the "links" always keep what they had promised, or David Durand in his criticism of the labyrinthine reading situation with hypertexts, which made readers resemble rats running through a tunnel and hunting for "some juicy information" (the other panelists were John McDaid, Peter Nürnberg, and Frank Ricardo).

6. Navigation and Visualization

As mentioned above, the "Engelbart Best Paper Award" at this conference went to three authors, namely Frank M. Shipman (Texas A&M University), Catherine C. Marshall (Xerox, Palo Alto), and Mark LeMere (Guidant Corp., Menlo Park). They experimented on the basis of the VIKI system presented at ECHT '94 by Shipman and Marshall and a third author, which offered various ways of linking VIKI to the web and making available work spaces. Users have the possibility, inter alia, to mark, according to the processing status (for instance, the first inclusion in a bibliography, the production of comments, connection with other references, etc), any documents they may have called up from the internet. This marking may be done by different colors, narrow or wide margins, and the collections of such documents may be arranged differently on the screen. This approach is a further development of the "fisheye views," permitting up to three centers and an arrangement in accordance with meridians (polar coordinates) or straight vanishing lines (rectangular coordinates, cf. the illustrations reminding of Vasarely) to be produced.



a



b

The authors' concern is about working with spacial arrangements and non-linear views: "Beyond Location: Hypertext Workspaces and Non-Linear Views." This reviewer particularly liked in that contribution that modeling is based on real work processes and realistic, problem-related projects. The authors conclude that a lot still needs to be studied especially along those lines ("significant use experience"). The contribution can be found under "Visualization (II)" in the Proceedings.

In Ted Nelson's concept of hypertexts (or rather hypermedia), "interactive movies" had been included right away as "branching movies" in which the viewer himself or herself was able to select the development of events. However, this produces a conflict between two principles of order, namely the development of dramatic tension as construed by the author, on the one hand, and the freedom of choice enjoyed by the viewer, on the other hand. Guy Vardi (Interdisciplinary Center, Herzelia, Israel) presented a kind of (experimental) interactive movie which avoids this conflict: The scenes are filmed from the respective viewpoints of the actors (by cameras mounted on their heads). In this way, later viewers of the film may select a particular perspective without, however, influencing the dramatic development of tension in the plot. In this model, a linear flow of the narration, on the one hand, and interaction, on the other hand, are no longer opposites: "Navigation Scheme for Interactive Movies with Linear Narrative."

Reinhard Kreutz (Institut für Medizinische Informatik, RWTH Aachen) presented a study, written together with two co-authors, in which a large number of types of links are defined on the basis of Java applets and handled in a simple way by CBT authors. ("No Longer Lost in WWW-based Hyperspaces"). A test of the navigation aids with 60 students and a hypertext of more than 300 pages on radiological diagnosis had produced rather satisfactory results.

A different survey problem was addressed by Jean-Hugues Réty (Amsterdam), namely, how a hypertext author using conditional linkage is able to keep track of

things. For this purpose, the author suggested a PROLOG machine, stating that the hypertext community, in that respect, could learn a lot from fault diagnosis.

In a contribution written by Vijay Kumar and Richard Furuta, but read by one of their colleagues, the topic addressed was "Visualization of Relationships." On the basis of the "Tm-Viewer" system introduced earlier, which originally had been developed for visualizing references in time (such as the regencies and relationships in the British royal family), an expansion was developed to more than temporal characteristics, and was verified by a collection of documents on the subject of hypermedia. Such playing with relationships as represented is to enable users to add their own supplements to such relationship structures, discover new relationships and, in this way, recognize them more effectively.

Finally, Cornelia Seeberg presented results of a project run by the Darmstadt Technical University (together with Achim Steinacker, Klaus Reichenberger, Stephan Fischer, and Ralf Steinmetz); her paper is contained in a somewhat remote spot of the Proceedings (pp. 167f). The project, which is called "iTeach," is about the development of an adaptive multimedia learning environment by means of multimedia and based on the printed book by Steinmetz/ Nahrstedt. Tables of contents generated dynamically and composed differently as a function of learning strategy and user group offer individualized, but coherent learning packages ("Individual Tables of Contents in Web-based Learning Strategies").

7. Contributions Associated with Reading and Literature

The papers and presentations about reading and literature discussed below include contributions from various sections of the conference, such as the session about "Hyperreading" referred to above, from the "Doctoral Consortium" (all other contributions not related to reading are bypassed with a reference of interested parties to WWW, see above), and a couple of impressions from an event called "Hypertext Readings" organized on the poster afternoon.

a

In this reading section, the prize winner of the "Ted Nelson Newcomer Award," Jill Walker (University of Bergen), will be mentioned first. Her report about reading Michael Joyce's "Afternoon" won her the award. Her study at the same time is a master's thesis under Espen Aarseth, and her written contribution, which constitutes the basis of this review, is a well-written and precise report about the stages of her reading, from initial confusion to the first recognition of a few basic

facts in the story and on to the description of the more refined ramifications and reading paths. All this is enriched with a lot of examples and a few categories mainly referring to Genette, such as the distinction, also to be found with Licia Calvi and other (female) speakers, between a "story" and a "narrative," or that between forward (proleptic) and backward (analeptic) jumps.

In terms of reading psychology the contribution, in my view, becomes most interesting in those passages where the author talks about the repetitions in "Afternoon" and her experiences with those parts, such as the difference she recognized between re-"reading" a passage and its being "retold." However, in her case (as in the contributions to be mentioned below), this reviewer had the impression that she was directed more towards the reconstruction of the hyperfiction's subject than capturing an independent phenomenology of hypertext reading. This aspect certainly is going to be a subject of study for a long time to come. However, Jill Walker has drawn attention to some of these moments that should be observed.

b

Among all contributions (to the conference program), that by Licia Calvi (Trinity College, Dublin) most directly addresses the question whether and in what respect reading traditional literature would differ from reading hyperfiction ("Lector in rebus: The Role of the Reader and the Characteristics of Hyperreading"). In answering these questions, she uses conceptual tools by Calvino, Eco and Moulthrop, addresses three classical models of "interactive fiction" (namely "Afternoon" by Michael Joyce; "Victory Garden" by Moulthrop; and "Samplers" by Deena Larsen), and concludes that such differences exist, but are less formal rather than semantic in nature: "So, if we want to understand the particular character of hyperreading, we have to shift our attention from a syntactical to a semantic level and to focus on link creation, i.e., on links as the carriers of meaning and as the means to elicit knowledge." Although this reviewer occasionally felt that the reading experiences accumulated (as material for further conceptual condensation) were submerged somewhat in the theoretical categories, the speaker presented a fascinating analysis. Where "link creation" is the decisive issue, the following study will link up easily.

c

Susana Pajares Tosca (Madrid) was represented both in the "Doctoral Consortium" (DC) and at the conference. In the DC she presented her plan for a doctoral thesis: "The Process of Reading Literary Prose: a Hypertextual Edition of James Joyce's A Portrait of the Artist as a Young Man." She intends to produce a hypertext by means

of the book mentioned in the title in order to trace the immanent associative reading process. So, it is not a matter of producing a hypertext about the book, although that might be very helpful to students, but of reconstructing the work ".... to see if hypertext can uncover some aspects of the reading process and help us understand how we read, not only this text, but literary texts in general."

Within the framework of the conference program, the author presented a paper about the lyrical quality of links which she finds, for instance, in playing with interpretations, or in the brevity and succinctness of text units. She localizes hypertexts somewhere between "poetic prose and poetry." When talking about the "lyrical qualities of links," she is a close neighbor of Deena Larsen's who tries to put this concept into effect as an author, as presented in a sample read within the "Hypertext Readings": "Ferris Wheel." The Ferris wheel assumes the function of subdividing the pieces of the narrative. In a text accompanying her poster she emphasized that links, like bridges, were more than units connecting two shores. Also some of the other contributions presented (by Jim Rosenberg or Lawrence Clark) exhibit more deliberate playing with graphic structures.

d

Also William Cole presented a plan for a doctoral thesis ("Ezra Pound, The Cantos, and Hypertext") which will consist in a self-reading experiment of the Cantos published in the late works by Ezra Pound. For his approach Cole uses the surfing metaphor popularized by the web, i.e. (real) surfing, which he considers an interaction of freedom and constraint, on the one hand, following the lines of force of the waves (by means of links) and, on the other hand, enjoying the freewheeling momentum (by way of reading). Pound's work and its "ideogrammic method" to him appear to be literary precursors of hypertext theory, predating both Ted Nelson and Vannevar Bush. In his reading, he is not going to limit himself to an exhaustive discovery of the relationships, most of which have remained hidden so far, but will treat the reading of these bulky texts as an excursion with an open end. Cole postulates that reading the Cantos is that variant of reading which is required also for hypertexts: "... and I would argue that the literacy needed to read the Cantos is hypertextual literacy." The result is something to look forward to.

e

Johanna Bucur (University of Passau), in her DC contribution, submitted a conceptual model for understanding links in interactive narratives ("The HyLink Framework: A Study of Link Performance in Hypertext Fiction"). The key factor was the distinction between links relating, on the one hand, to the respective chain of events (by way of the story) ("relevant links") and, on the other hand, those links

which only have a supplementary, decorative function without advancing the plot ("plot irrelevant links"). The plot-related links are further subdivided into two types, i.e. those furnishing the reader with further information at a specific level of the state of events and of the plot, which are optional in character, and those with an indispensable (compulsory) function which solely advance the story and the tension generated. The author also seems to plan a reading experiment, as can be taken from the introductory remarks in her text, in which she wants to facilitate for her readers the job of selecting in reading by providing such typified links enabling readers to move through the "textual network" more easily.

f

Anja Rau (University of Mainz, American Studies) was represented also both on the "Doctoral Consortium" and in the conference program: "Towards the Recognition of the Shell as an Integral Part of the Digital Text." She emphasized that the paratexts and metatexts surrounding the "real text" were hardly considered in HT theory. She pleaded in favor of devoting more attention to these textual varieties because the distinction between main texts and subsidiary texts became more and more blurred anyway, or could even turn into an aesthetic program (as in "Afternoon" or in John McDaid's "Funhouse"). "Interpreters of digital fiction do well to include the Shell into their analyses." In her DC contribution, she looked into the relationships among authors, readers and texts, remarking critically: Contrary to the theoretical positions which made the reader, as suggested by Landow, a colleague co-writing the work ("w(riter)-reader"), readers de facto had only limited degrees of freedom, and the author put himself even more into the foreground instead gradually fading away and finally dissolving, as theory claims.

g

Wendy Morgan (in "Hyperreading") reported about a hypertext experiment involving a text written by two authors (Patti Lather & Christ Smithies) who presented their field research about women suffering from Aids in a report, presenting on the same page and with equal emphasis, the narratives of the women interviewed and the research and interpretation texts of the research scientists (in addition to other components, such as quotations, references, etc.). The speaker, with the consent of the authors, revised part of that report, supplementing it with material of her own - as a hypertext so as to analyze the result and the working process from a specific point of view she called post-structuralist and "post-feminist." Although hypertexts, "by their very nature," were not non-hierarchical, the tools did offer means to build decentralized, polyvalent, self-reflecting and rhizomatic text collages which remained open towards the reader and could be "continued." ("Electronic Tools for Dismantling the Master's House: Poststructuralist Feminist Research and Hypertext

Poetics," was the title of her presentation.) In a different way than with Deena Larsen, the links in this case become relationships.

That this continuation of writing may also have its negative aspects was noted by the speaker from the upset reaction of her colleague who hardly recognized her own texts in the new hypertext environment. A similar experience was made by Heido Idensen (University of Hildesheim) with collages of texts by congress participants, who reacted not only by showing pleasant approval. He presented this CD-ROM in the "Hypertext Readings" ("Netz Werk Kultur Technik").

h

Christiane Heibach (University of Heidelberg), in the early parts of her Ph.D. thesis, uses internet art projects to examine how traditional forms of art and artistic and aesthetic categories mix and require a new language of description which does not yet exist and develops only gradually. Thus, referring to some selected web projects and using Richard Lanham's concept of oscillation, she refers to the origins of new forms and phenomena: "All of those projects, at least all forms of communication, represent an oscillation between former separated categories. As a result of these oscillations new, 'third' phenomena come into being, formed by a 'polylectical' movement." This blurs the boundaries between forms of art (graphics, music, film), or between forms of communication, on the one hand, and forms of interaction, on the other hand, and makes the viewer truly a "co-creator" inasmuch as both art and its reception become strongly dependent on process and interaction. The examples she gave of such more recent art projects were "Grammatron" by Mark America, "WaxWeb" by David Blair, "Can You See Me through the Computer" by Juliet Martin, and "Beast" by Jacques Servin.

i

Not a hypertext, but literary theory was the subject of a presentation by Perla Sassón-Henry (New York State University), again in the DC: "Jorge Luis Borges: A Forerunner of the Technology of the New Millenium." Borges's story about the "Garden of Paths Branching out" is one of the numerous traditional models of the hypertexts born later. The author of the paper specifically traces this relationship between the story and HT theory. In a traditional medium, Borges indicates the possibility of infinite branchings of a story within that story by pointing, in one place, to the different futures in which the two main characters (Albert and Yu Tsun) may be once friends and once enemies. It was ironical, the speaker said, to announce in a paper-based medium a story with infinite branching capabilities. The poet created this imaginative space for the reader by means of language, while hypertext offered this branching de facto (as Stuart Moulthrop once actually tested in an experiment).

8. Conclusion of the Conference

Robert Cailliau read the final conference paper („The Sorcerer's Apprentice. Digging up Our Roots"), and he did so as a co-developer of the WWW at CERN, besides Tim Berners-Lee, who had changed to MIT in 1994. Both had won the ACM Software System Award in 1995, which they had shared with their colleagues of NCSA, Andreesen and Bina. A rundown of the individual steps of web development constituted the main part of Cailliau's presentation, after some critical introductory remarks about the state of development reached in the I&C sector in general and the internet in particular. Berners-Lee and Cailliau are in the process of writing a book about this history of the internet and the web, thus very soon providing an opportunity for everybody to study the original "Proposal" (1989), in favor of which Cailliau withdrew his own proposal, and to smile at the comments by Tim's boss at the time ("vague but exciting").

This paper was a popularized version of technology history, presented in a relaxed and ironic fashion. That scientists at CERN, of all people, happened to have the idea of developing a proposal of a hypertext-based "information management" system may be due to the fact, thus the speaker, that that high-energy physics laboratory had a long history of data processing and networking, and that the large number of guest physicists spread all over the world needed a communication system (there are a couple of web pages on that aspect: http://www.cern.ch/Public/). The invitation extended to Cailliau to present a paper at a hypertext congress, in a way, is a program, as SIGLink just changed its name to SIGWeb. Accordingly, the speaker ended by asking for intensified cooperation between the hypertext and the web communities. The web community is going to hold its next congress in Toronto in mid-May 2000.

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Notes

1. The experience accumulated by the reviewer and others was described in Böhle, Riehm, Wingert: Vom allmählichen Verfertigen elektronischer Bücher. Frankfurt am Main, Campus, 1997.