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technical report

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Interview with Charlie Kreitzberg re: *Amnesia*

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Preamble

This is an interview with Charlie Kreitzberg, conducted via email between March 8 and June 20, 2019. He ran and still runs Cognetics, now Cognetics Interactive, the company that developed the game *Amnesia*, which was eventually released by Electronic Arts in 1986 for the Apple II and other platforms.

This work received ethics approval from the University of Calgary's Conjoint Faculties Research Ethics Board, file REB16-1235. Both interviewer and interviewee have agreed to release this interview under a Creative Commons Attribution-ShareAlike 3.0 Unported License.¹

Interview

(Interview questions appear in *italics*.)

Having seen any number of early-1980s computer-related companies disappear, it was a nice surprise to discover that Cognetics is still in business in 2019. How did game development fit into the overall picture of what Cognetics was doing at the time?

When I graduated from college in 1969, I went to work at Educational Testing Service as a Senior Systems Programmer. I got that job because I had worked in the CCNY computer center for several years and was facile in both the IBM 7040 computer and the, then, new IBM 360. ETS was transitioning from 7040 to 360 so I was a good fit for their IT department.

¹<https://creativecommons.org/licenses/by-sa/3.0/>

I left ETS in 1982 to start Cognetics Corporation. Initially Cognetics was me and Susan Calia (née Arillotta). As an undergraduate, I had attended a class by the computer pioneer Richard Hamming. One day he raised the question, “why is there no style guide for programmers like Strunk and White’s classic Elements of Style?”

My classmate Ben Schneiderman and I discussed that question and resolved to write one. Much to my surprise, Harcourt agreed to publish it. Ben and I went on to write a second book which used an educational psychology model to present programming concepts. This book, FORTRAN Programming: A Spiral Approach, unexpectedly became a best seller. These books led to a series of consulting jobs for Harcourt in which I produced ancillary materials (teacher’s guides and test banks) for textbooks with my then wife Valerie Sasserath. The money we earned helped fund our graduate education.

In 1982, I left ETS to start Cognetics Corporation. The name Cognetics was a portmanteau word that combined cognition and technology. Our first client was Harcourt Brace Jovanovich which, based on my work as an author, asked me to develop a consumer-oriented computer program to accompany their study guide for the SAT. This product, called Computer SAT, was released in 1983. I designed it and it was programmed by Pat Reilly. Computer SAT became a bestselling educational software package.

In the 1980s, consumer software – games, educational and interest projects – was an emerging industry. Jane Isay is a brilliant editor who had started at Yale University Press and was the co-publisher of Basic Books, an imprint at Harper & Row. When Harper & Row decided to enter the consumer software field, Jane Isay was asked to run the new organization. Judy Greisman, who was an editor at Harcourt, moved to Harper & Row and introduced me to Jane Isay.

Jane and I developed a close relationship and spent a lot of time conceptualizing products. Given the success of Computer SAT (and follow-on programs Computer GRE and Computer ACT) and the potential of the relationship with Harper & Row, I decided that Cognetics Corporation would focus on consumer software.

At Cognetics, we did not see ourselves as a game company. Our clients were publishers who paid us to develop consumer software products they would market. Our initial tag line was “The design of bestselling software is no accident. We produce best sellers by design.” This design philosophy has been central to my work and to Cognetics over the years.

I led Cognetics for 25 years. Eventually, I “burnt out” and decided to shift my focus. In the early 2000s we downsized the company and I retained it as a personal services company. A few key staff members wanted to remain and continued to work with me but most quickly found other jobs.

In 2016, I joined Princeton University as Senior User Experience Advisor in a newly formed User Experience Office. Although Cognetics still exists (now under the name Cognetics Interactive), I use it only for occasional consulting services.

How did the idea for Amnesia come about, and how did Thomas M. Disch and Cognet-

ics become involved with the project?

The roots of Amnesia go back a long time. When I was at Educational Testing Service, I became aware of the emergence of personal computers. I was able to secure Commodore PET serial #26 and was enthralled by the potential and power I saw in these new devices.

At about the same time, I first encountered text adventure games. I don't recall if the first game I tried was Colossal Cave or Zork, but I was very impressed. Recall that at that time, it was pre-GUI and the only natural language processing that I was familiar with was Joseph Weizenbaum's ELIZA which had been released in 1966. The idea that it was possible to interact with a computer in natural language was really exciting.

My journey to software publishing started with books. Ben Shneiderman (now a Professor of Computer Science at the University of Maryland) and I had co-authored two books. Cognetics' first product – Computer SAT – was packaged with a book.

In addition, in 1982 Ben Shneiderman had implemented a new concept and research product that he called TIES (The Interactive Encyclopedia System). With TIES, Ben developed the idea of hyperlinks. When he shared his work with me, I was excited by the potential of hypertext to create electronic books. Cognetics developed a commercialized version of TIES we called HyperTIES – one of the first hypertext systems.

Working with Ben and the Association for Computer Machinery, we produced a special issue of Communications of the ACM called Hypertext on Hypertext. This electronic document was referenced by Tim Berners-Lee in his original World Wide Web proposal to CERN. We also worked with Ben and Greg Kearsley, to produce a book called Hypertext Hands-On, published in 1989 by Addison Wesley which offered the same material in both printed and hypertextual form.

All of this work seemed to be leading to new models of publishing. So, as Jane Isay and I thought through the relationship between books and software, we talked about adventure games as a possible vehicle.

Jane, of course, was well-connected with authors. And she brought Tom Disch to the project.

My understanding is that there was going to be a different publisher for Amnesia. Tell me the story of the game's publication process and how Electronic Arts wound up publishing it.

As was the case with many traditional publishers, Harper & Row was concerned that the software business would not be profitable and they decided to close the group down. This left us with the problem of what to do with the various projects in development.

Electronic Arts, then a relatively new company, picked up Amnesia. Don Daglow became the producer. A second adventure game Fraggie Rock: The Mystery of the

River of Song went to CBS software.

There is a script for Amnesia available online.² Is this authentic, and if so, who wrote it and how was it used during game development?

This is an authentic script and was what Cognetics used for development. Over the course of the project, there were many revisions. Also, as I recall, we started with a partial script and Tom wrote additional material as we went along.

What input did you personally have in terms of the gameplay, implementation (of the game or the game authoring system), or the story itself?

I led the project and was responsible for the overall design. Kevin Bentley did the programming of the script and James Terry developed the underlying system (which we called the King Edward language).

Development doesn't always go smoothly. Were there any problems during production of Amnesia? If so, what were they and how were they resolved?

It was brutal. James and Kevin worked countless hours on this project. At one point, Kevin drove from Princeton, New Jersey to California to work on the game at Electronic Arts and stayed there for several months.

What made the project so hard was that we were severely limited by the technology.

We developed the game on an Apple II computer. This was an 8-bit machine with no hard disc and limited RAM. We were able to purchase a third-party additional RAM for the computer and wired it in. It was too large for the case, so it hung out over the side.

Compiling the game took more than a day. The computer ran so hot that we purchased a large fan and pointed it at the open case. Every time we did a compile, we prayed that the equipment would keep working long enough to get us to an executable.

We were also limited by the fact that all we had were 5¼" floppy discs. There was no hard drive to work with.

The "King Edward" development system was apparently Forth-based. Why was the decision made to use this system, and were any other alternatives considered?

James Terry is a brilliant programmer. He was deeply invested in Forth and felt that it was the right tool because it was so technically efficient and extensible. Given the technical restrictions that we were working with, that was important.

Another feature of Forth is that it was not deeply embedded in an operating system. This helped when we had to port the product to other computers as well as enabling us to create the entire shell within which we programmed the game.

²http://ascii.textfiles.com/images/amnesia_manuscript.pdf

We did not program the script directly. Instead we came up with the King Edward programming language. King Edward was a shell which interpreted the script. The idea was that Kind Edward would be usable with many games and would interpret the script for each.

The paradigm for Kind Edward that I came up with, was to envision the game as a series of stage sets, much as you might have for a play. I thought of the game as a play where the actor (the player) did not have a written script.

For example, the hotel room where the game begins was one such set. The set was populated with objects. You could act on an object by typing a natural language phrase. So you could, for example, pick up a hairbrush. When you executed an action, it would trigger a routine attached to the object that produced an output and perhaps also set some state indicators. So, the player might type "Pick up hairbrush" and the computer would respond "You brush your hair, parting it on the left," or whatever the script said. The script was not 100% complete, so we added a lot of responses ourselves.

The model we created was somewhat analogous to the way virtual assistants like Alexa work today (although with text rather than speech). We would parse the text, delete extra words and then attempt to match it to a table of phrases. If we found a match it would trigger the associated response. If we could not match, we delivered a generic response.

Of course, we had to also add state information, and this became rather complex. If you picked up the hairbrush a second time you would not want to see the same response. It would be better if the computer replied something like "You already brushed your hair. Don't be vain." That was challenging because the number of states could get quite complex.

The name King Edward came about in an odd way. We got a phone call from someone in the media who was asking us about the project. They asked about the software language it was written in and what its name was. It didn't have a name. For some reason, a book of matches with an ad for King Edward cigars was sitting on the table (I am not sure why since no one, to my recollection, smoked). Someone, I think James, looked at it and without missing a beat said "It's the King Edward" language. And so it was, thereafter.

Writers can be notoriously quirky. How did you find working with Thomas M. Disch? Tell me about some interactions that you had with him.

Tom could be quirky. We did not have a lot of face-to-face contact. Most was done over the phone and a lot through Glen Hartley who later became his agent. Cognetics also had an agent, Steve Axelrod, who represented us in negotiations.

We were honored to work with Tom Disch whom we saw as brilliant. He viewed Amnesia as a new type of novel, and we all knew we were breaking new ground. I suspect that neither Tom nor Glen fully understood how hard we were working nor how difficult the technical challenge was.

One evening, Glen called while the staff was around. We were exhausted. When they

realized who was on the phone, the staff started booing. Glen was quite taken aback. But all in all, we were very excited to work with Tom and very proud of the product we produced.

There were several people apparently involved with development at Cognetics. Kevin Bentley was the programmer; James Terry developed the King Edward game authoring system that Bentley used; Pat Reilly was working on a Fraggle Rock game at the same time. How did all these people come to work for Cognetics?

When I left ETS in 1982 to start Cognetics in the basement of my home, Suzanne Calia (née Arillotta) joined me. Sue managed finance and operations for Cognetics and remained with the company for many years.

The first person we hired was Pat Reilly. He worked on Computer SAT and later on Fraggle Rock.

As the company grew, we hired more staff. Soon after our founding, we were faced with a client who had a serious technical problem on the Apple II. The consensus of the programmers they consulted was that the problem was endemic to the Apple II system and could not be fixed. We placed an ad for a programmer and James Terry and his brother Scott responded. They quickly fixed the unfixable problem and remained with Cognetics.

In Lawrenceville, NJ which is the next town to Princeton, there was a great grocery store called Bentley's which I frequently patronized. Kevin was the grandson of the owner. When the store closed, he asked about working for Cognetics. Kevin joined our staff and implemented the script, using James Terry's King Edward language.

Lis Romanov is pictured on the game's album cover – what role did she play?

We hired Lis as a technical writer to help us with documentation.

The game's album cover also says "Dedicated to Glen Hartley." Who was Glen Hartley, and who made this dedication?

Glen Hartley worked for Harper & Row and later became Tom Disch's agent. The dedication came from Tom.

The game comes with what (in Infocom terms) would be described as "feelies." Besides the usual manual and platform-specific instruction insert, there was a "Street and Subway Map to Manhattan" and "The X-Street Indexer," the latter being a code wheel for copy protection. Whose idea were the feelies? Were there others discussed but cut, and if so, what were they?

We wanted a way to copy protect the product. At that time, there were no copy protection schemes that we knew of for the Apple II, so we invented the "wheel." I don't remember exactly how it worked except that you could select a street on the circumference and view a code through a cut-out window. At that time, there was an algorithm

in the NYC phone directory that enabled you to estimate the cross street given a street address. I think we used something like that.

The subway map was, as I recall, a standard map that we included so the player could find their way around Manhattan.

I had this idea that the city should be responsive to the player. I wanted to do this because I was concerned that the game would become dull as the player wandered around unless there were interesting responses to the player's actions. So when we created the game, we added a whole bunch of functionality around the streets of Manhattan. As I recall, there was weather (you could get soaked in the rain) when you were walking on the streets. There were phone booths where you could call a few numbers (of course this was before cell phones). You could walk into buildings you passed and explore. And you could take the subway. I think that people also approached you for handouts.

The idea was great, but the execution was less so. We just did not have enough technology to manage the simulation and we had to code all the streets into an electronic map and fit it on the disc.

Do you know how well the game sold?

My understanding is that it did moderately well but was not the blockbuster that we, Tom, and Electronic Arts hoped for.

Beyond sales, how was the game received, and do you think it got a fair reception?

I don't know that the word "fair" makes sense. I think that Amnesia was a brilliant first attempt and had Harper & Row or CBS Software continued in business, we would have built on what we learned and created new and more exciting games. That was the vision.

As I recall, there was a nice feature in Newsweek about the game (though I have been unable to locate the article). I recall that when I read it, there was just a single mention of Cognetics. That hurt but I think it reflected the lack of understanding, outside Cognetics, about how truly difficult the project was and how amazing and innovative the King Edward system that James Terry developed was.

As an interesting aside, after Amnesia came out, Cognetics began to shift its focus from games to usability design and consulting. I felt that we were a bit too buttoned-down for the games industry and our fit to business was better.

About the time that Amnesia was published, we were hired by Citibank to help them design the next generation ATMs. A few days after we were hired, the Newsweek article came out and one of the senior managers showed it to the head of their new "Humanware" group. "I want you to hire people like these," he said, pointing to the reference to Cognetics. The head of Humanware replied, "I already did."

[The Newsweek article is probably "You Are What You Read," by D. Lehman, 12 January 1987, p. 67. Lehman's full interview with Disch is published in Southwest Review

73(2), 1988, pp. 220–321.]

Looking back, what would you have done differently with respect to Amnesia's development?

Amnesia was both a great success and a disappointment. We worked incredibly hard on the project. It stretched our technical chops, the hardware, and our stamina to the limit.

Yet, from a market perspective, Amnesia was not a blockbuster. Why?

I think there were several reasons.

One is that the time of text adventures had passed. Text adventures gave way to graphic adventures (like Myst) and these, in turn, gave way to shoot-em-up games.

Another issue was that we were far too constrained by the technology to be able to implement our vision. In this regard, I think that Tom Disch's script was probably too sophisticated for the computers available. Manhattan was too large. And the story too vast. If we had, for example, remained in the hotel, we could have built out the interactions in a more satisfying way.

None on these problems were due to the work that Kevin Bentley and James Terry did. It was nothing short of fantastic. The job was just larger than the technology at that time could support.

If I were doing it again, I would want to have a much closer and more interactive relationship with the author. I think that in Tom Disch's and Glen Hartley's mind, there was a separation between the writing and the implementation. More like traditional publishing where the author hands the script to the publisher who takes it from there. But I believe the result would have been better if we had been able to work more closely with each other.

It was also a time when personal computing and consumer software was brand new. No one really understood the business model. Harper & Row did not give Jane Isay the time she needed to build a thriving business. Neither did CBS give CBS Software the time it needed so Fraggie Rock never made it to market.

All this being said, it was a heady and exciting time. Amnesia was a work of deep love and passion. I see it as a high point in my personal history and am grateful for having had the opportunity to work with Tom Disch, Jane Isay, Don Daglow and the awesome staff of Cognetics.

If I were to do it over (which would be fun) I would stay with something close to the King Edward language. I think that the idea of stage sets with objects that have associated routines that are triggered by actions is still a good model and one which would work far better with the tools we have today.

I would opt for a smaller world so we could go deeper rather than broader.

Given today's ability to process natural language, I think the entire game could be spoken. Without graphics, as it was originally envisioned, Alexa or Siri could deliver

it and it would be much easier to play.

Should it have graphics? I don't know. Personally, I prefer images in my mind, evoked by the script rather than pictures.

What haven't I asked you about Amnesia that I should have?

We were finalists in the Software Publisher's Association annual awards. I got to wear a tux and hear Robin Williams joke about forgetting the name of the product that was up for the award. We didn't win but it sure was fun.