



TWISTY LITTLE PASSAGES
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AN APPROACH TO INTERACTIVE FICTION

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Of course, SHRDLU was not created to be a work of interactive fiction or to be an interesting literary experience. It was supposed to be, and was, an extremely important advance (or series of advances) in artificial intelligence and natural language understanding. Interacting with it-even without having any motivation provided by the scenario-was quite impressive for researchers at the time. As the first work with all the formal elements of interactive fiction, SHRDLU not only achieved its research goals but also allowed for more interesting potential narratives, simulated spaces, and challenges to later be integrated with the sort of structure it exemplified. By augmenting SHRDLU's parser and world model (actually, a far simplified version of these) in this way, interactive fiction could be fully realized.

ADVENTURE: WE HAVE CAVE

In 1975 Sandy and Laura explored a cave by having a conversation with a PDP-10 computer, almost certainly by means of a remote ASR33 Teletype (Adams 2002). The girls would have been about five and seven years old then (Brucker and Watson 1987, 71). They ventured into the Flint Mammoth Cave System through the Bedquilt Entrance in Kentucky, opening a steel grate beside a dry stream bed and finding a place underground that was full of turns and wonders. The computer program that took them there was able to communicate in plain English. It had some of ELIZA/DOCTOR's charm-at least offering them a spectacular environment to explore and a motivation to interact-but like SHRDLU it could also understand them well enough to have their caver "player character" take action within the world. This new program, which these two early interactors are said to have enjoyed, was called Adventure. It

was the first work of interactive fiction (certainly, the first created as such, with an intriguing world), and they were among the first to experience it-if not the very first-because it was written for them by their father, Will Crowther.

It was in 1975 that Crowther completed Adventure-his version of Adventure, the original, with the file name ADVENT. He made it available to his daughters and to any programmers on ARPANet-connected computers. Crowther, who worked at Bolt, Beranek and Newman (BBN) in Cambridge, Massachusetts, was one of the programmers who had developed the ARPANet, the basis for the Internet, a few years earlier. He had played Dungeons and Dragons regularly with a local group, started by a fellow employee at BBN. One of the players in that group, who joined after Crowther left, describes it as follows:

Eric Roberts ... started running a D&D group a year or so before Adventure was written. Eric had his own ideas about how D&D should be done, emphasizing story-telling and de-emphasizing the mechanical aspects of the game such as die-rolling (though there was still a lot of that). He tried to create a Tolkien-inspired world that was fun and consistent with Middle Earth.... I think one strong component of his D&D philosophy that carried over into Zork was to try to keep the mechanical workings of the game (the rules, or the implementation) as hidden as possible, which to me enhanced the fun and immersiveness of the experience. (Lebling 2002)

This report comes from one of the authors of Zork, who may have replaced Crowther in the group. He, like Crowther, played a thief. Their game sessions were, indeed, Tolkien-inspired, despite what TSR had to say about Tolkien and Dungeons and Dragons. Characters were killed off regularly, but usually not permanently.

Although Crowther was a player of these Tolkien-inspired Dungeons and Dragons games, when he described the underground setting of Adventure it wasn't fantasy writing. Crowther was also an experienced caver, and he had explored and mapped many parts of the cave system that Adventure simulates. In 1972 he had found a way to apply computing to caving by plotting maps of that cave system based on survey data, working with his wife Pat Crowther, who was also a BBN employee. The two had met at MIT, and she was also a caver (Brucker and Watson 1987, 167-177).

Will had been along with Pat on an unsuccessful 26 May 1972 expedition to try to find a connection from the Flint Ridge Cave System to Mammoth Cave, for instance. Later, on July 15, Pat managed to squeeze through the appropriately named Tight Spot in the Flint Ridge Cave System to explore, announcing to the others when she returned, "We have cave!" (Brucker and Watson 1987, 192). Then, on September 9, 1972, Pat was part of the first party to make it through the Tight Spot and find a connection from the Flint Ridge Cave System to Mammoth Cave. As a result of that expedition, more than 144 contiguous miles of cave were then surveyed. The two cave systems were joined to one, the Flint Mammoth Cave System, making it the longest in the world (Brucker and Watson 1987, 233-248).

Crowther explains that things were different later, when he began work on Adventure: "I got involved in a divorce, and that left me a bit pulled apart in various ways. In particular I was missing my kids" (qtd. in Peterson 1983, 187-188). He had stopped caving at that time as well, but decided, he said, to "write a program that was a recreation in fantasy of my caving, and also would be a game for the kids, and perhaps [have] some aspects of the Dungeons and Dragons that I had been playing" (qtd. Peterson 1983, 188). Crowther explained that BBN fortunately was, like MIT, openminded about programmers developing games on their expensive computer hardware: "The idea was that you did your work and if the machines were sitting idle and you had something else that you wanted to do, why not?" (Crowther 1994, 8). He developed Adventure while working there, in FORTRAN on BBN's PDP-10. FORTRAN, which some regard as the first high-level programming language, was developed at IBM and used widely in mathematical, scientific, and engineering applications. It came to be used in business, too, but although many hackers knew it, most in the artificial intelligence community eschewed this procedural language for the functional language LISP or one of its variants.

Some versions of Adventure (dozens of commercial and free implementations have been made available) are called Colossal Cave. The work simulates an area known as Bedquilt Cave (Adams 2002) or the Bedquilt Entrance, which was connected to Colossal Cave in 1896 (Brucker and Watson 1987, 294). (Bedquilt and Colossal are both entrances to the Flint Mammoth Cave System.) One caver, Mel Park, relates that in the actual cave system, just as in Adventure, "there is a Hall of the Mountain King and a TwoPit Room. The entrance is indeed a strong steel grate at the bottom of a twenty-foot

depression" (qtd. in Adams 2002). A small outdoor area leads, through this grating, to the main part of Adventure's simulated underground world. This world is described much as one would expect a caver to describe it: succinctly, but using the same terminology and with the same attention to essential details. "Staircase," "dome," "room," and "hall" are used to indicate natural formations, and the emphasis is on where there is access for further travel. Here is one description of a location in Adventure:

YOU ARE AT A COMPLEX JUNCTION. A LOW HANDS AND KNEES PASSAGE FROM THE NORTH JOINS A HIGHER CRAWL FROM THE EAST TO MAKE A WALKING PASSAGE GOING WEST. THERE IS ALSO A LARGE ROOM ABOVE. THE AIR IS DAMP HERE.

Crowther, departing from the realistic simulation of caving, placed five treasures within as an incentive to explore the cave. The interactor also has to figure out how to get past a snake to have the player character move deeper into the cave. The player character is harassed at times by attacking dwarves and by a pirate who pilfers treasure. There was a single maze in this first version, one that was essentially impossible to get through without making a map. The lantern in Adventure had limited battery life, too, adding some time pressure-or turn pressure, since time in the simulated world only passed in response to input (Nelson 2001b, 344). Some of these were the aspects that made Adventure a "computer version" of Dungeons and Dragons (Crowther 1994, 1). It imitated that role-playing game not by having dice-driven combat based on ability and experience points, or by allowing the interactor to take the role of a particular fantasy character, but by providing opportunities for creative problem

solving and by providing a challenge that could be definitively met. Like Dungeons and Dragons, Adventure, as Solomon (1984) explained, was a cooperative game: "If there are many players, as is often the case, they function as a team" (21). It seems likely that it was played cooperatively from the very beginning, by Crowther's daughters and by programmers working together. Another way in which it was more related to the riddle and to Dungeons and Dragons than to other types of gaming was that while it could be solved, Crowther's original Adventure did not keep score (Peterson 1983, 188).

But in 1975 Adventure had only begun. "Working at SAIL, the Stanford Artificial Intelligence Laboratory, in the Spring of 1976, Don Woods discovered Crowther's game among a number to be played across the burgeoning (110-computer) ARPANET" (Nelson 2001b, 345). Woods describes his impression of it and what happened next:

I thought it was a neat idea for a game, but there wasn't a lot to it, and it was full of bugs.... I sent mail to crowther@xxx for every xxx on the net. I got back lots of error messages, but eventually did hear from Crowther ... He sent me the source in return for a promise that I would send him any changes. (qtd. in Aarseth 1997, 99)

While Adventure was related to well-known artificial intelligence projects in some ways, and Woods was working in that field when he made his modifications to the program, he explained:

It was certainly never an official project. SAIL was simply the computer system where I had my primary account while at Stanford. So when I found Adventure (which was actually on

SUMEX, the Stanford Medical School's computer) and got the source from Crowther, I did all my development on it on the SAIL computer. I've certainly never claimed Adventure used any sort of AI (such as understanding natural language). To the contrary, I usually take care to emphasise that Adventure's language parser was extremely primitive even for the state of the art at the time. (2002)

It is the Crowther and Woods version of Adventure, with its primitive but effective way of understanding language, that endures and that became widespread. It also became the archetype of the text adventure and of interactive fiction. Crowther's original, which may have been lost, is not publicly available today. Woods fixed bugs in the original, for instance, repairing one location that for no apparent reason lacked exits (Woods 2002). Nelson (2001b) recalls that "Woods reworked the caves and stocked them with magical items and puzzles, liberally ignoring the original style from time to time" (345). The new additions included a maze with a vending machine from which one could buy batteries for the lamp. This would allow the adventurer to stay in the cave longer. Woods introduced more magic, and placed some of it close to the surface; in the original work, what magic there was was deeply buried (Jerz 2001b). An intriguing addition was an "endgame" segment that referred to Adventure being a computer program: The cave closed after all the treasures were collected, and the player character was moved to a place where the various creatures of the IF world were sleeping like uninitialized variables. Woods (2002) wrote in an email, "I realise it was a bit off, because it 'broke the fourth wall' and referred to the game." Yet this segment of Adventure was "off" in a very interesting way. The canonical first work of interactive fiction concludes by violating levels

of narrative and simulation, using metalepsis of the sort that makes many twentieth-century fiction works so intriguing. The new version was distributed widely, made available via the ARPANet and also handed out on tape by DECUS, a user group (Nelson 2001b, 345).

The two mazes provide one of the most popular expressions to originate with *Adventure*. (The magic word "XYZZY," with its frequent mention in computing culture (Rothstein 1998) is the other.)

The pirate's maze offers rooms that are all uniformly described as "a maze of twisty little passages, all alike." To figure out which room is which, the player character must drop objects to mark the different rooms. The rooms, once all alike, can then be differentiated based on their contents and mapping of the usual sort is possible. In the other maze, the interactor reads in one room that the location is "a maze of twisty little passages, all different" and may imagine being similarly stymied; but the next room will be something like "a maze of little twisty passages, all different" and there is a reward for close reading.

From the perspective of the interactor, a work of interactive fiction can itself be seen as a maze of twisty little textual passages-some alike, some different; some produced by the computer, some typed by the interactor-that is to be traversed. But of course it is also a maze of simulated passages through an IF world; this is what distinguishes works in this form from hypertext fiction, chatterbots, and random poetry generators.

Sarah Sloane (2000) noted that "from this one early game, *Adventure* ... came a variety of digital fiction conventions in how to move through the story space" (58), such as abbreviations for different compass directions. Not only did it establish interface

conventions and provide the default (underground) environment, the revised Adventure of Crowther and Woods also drew together a simulation of cave exploration, magic, and problem solving to create a work that had the archetypal texture of a text adventure.

Many different dates are given for Crowther's creation of the original Adventure and for the canonical version as augmented by Woods. The specific dates given range at least from 1967 (Herz 1997, 10) to 1978 (de Geus, Jongean, and Koelmans 1985, 1). Oddly, the one Ph.D. dissertation that has been written about this work (Buckles 1985) does not mention when Adventure was completed. Crowther himself has not given an exact date but says it was written within a year of 1975 (Jerz 2001b). The question of the date is so involved that a paper has been written about establishing the date of Adventure's creation from existing sources (Wille 1999). (It concludes that 1975 is most likely.) Given that Dungeons and Dragons was not published until 1974 (McGath 1984,6) and that Don Woods named April 1976 as the month of release of the substantially modified version he created (Aarseth 1997, 99), it is very likely, if not certain, that, as one famous computer scientist has concluded, "Adventure ... was originally written by Will Crowther in 1975" (Knuth 1998, 1).

Adventure may not have been much of an artificial intelligence system, but it was, as Crowther (1994) described it, "a thing that gave you the illusion anyway that you'd typed in English commands and it did what you said" (2). Understanding the interactor and doing what was specified within a simulated world made the program SHRDLU-like; the part that was an illusion of understanding-and was convincing-was following the tradition of ELIZA/DOCTOR. These two

programs were its most direct predecessors on the computer (McGath 1984, 11-14), though they did not directly give birth to interactive fiction. While Adventure used natural language (or at least a subset of English, as far as input was concerned) and was intended for people who were not programmers, its pleasures were in some ways similar to those of programming, according to Crowther (1994): "People enjoy it ... Because it's exactly the kind of thing that computer programmers do. They're struggling with an obstinate system that can do what you want but only if you can figure out the right thing to say to it" (2-3). Indeed, many programmers found that they did enjoy Adventure, which Steven Levy (1984) described as "a metaphor for computer programming itself-the deep recesses you explored in the Adventure world were akin to the basic, most obscure levels of the machine" (141). Whether the cave was a metaphor for the machine or not (and the final sequence that Woods added to Adventure certainly suggests that it is) the work presented a compelling challenge, to figure out both what to do and how to do it.

By 1981 Adventure was widely known among programmers and, as described in the next chapter, it was also widely imitated by them. Tracy Kidder's Pulitzer Prize-winning *Soul of a New Machine* brought it to the attention of the general reader that year. The book described, probably better than any academic article or piece of journalism since then, how a particular interactor actually approached a work of interactive fiction:

Carl Asling's cluttered little area made a small rectangle of light. Strewn before me across the surface of his desk, like relics from a party, lay dozens of roughly drawn maps. They consisted of circles, inside of which were scrawled names

such as Dirty Passage, Hall of Mists, Hall of the Mountain King ... Webs of lines connected the circles, and each line was labeled, some with points of the compass, some with the words up and down. Here and there on the maps were notations-"water here," "oil here," and "damn that pirate!" (Kidder 1981, 86)

Making such maps was an essential part of solving Adventure and would remain essential to interacting with most other works of interactive fiction. Kidder also described how, during an after-hours introduction to Adventure, more than one person was involved in interacting. In this case, Kidder typed while Asling looked at what he was doing and commented. This was one observation of people, playing this cooperative game, who did not interact in solitude.

Adventure has been the topic of a good deal of discussion and analysis, even if many important questions about it remain. This short section has treated only the most important aspects of the history and creation of Adventure. Despite the uncertainties that remain about exact dates and about the differences between the original and expanded works, a great deal is known about the influences on Adventure, the contexts in which it was created, and the authors themselves. While Crowther's original program is not available as of this writing, the canonical Adventure as expanded by Woods is one of the most universally available computer programs in existence, running on hundreds of platforms.

As important as Adventure is, however, it is impossible to learn about the course of interactive fiction's development by looking in detail at only this first work; the development of the form must be

seen in how later works differ from Adventure. The next chapter undertakes a detailed comparison of Zork and Adventure, with a focus on the former work. Aarseth (1997) complains, with justification, that Zork "is often, and undeservingly, claimed as the paradigmatic adventure game" (108). (For instance, Hamlet on the Holodeck, the first scholarly book to discuss Zork at length, does not mention Adventure U. Murray 1997).) In this book Zork is treated in more detail than Adventure to illuminate the form's history, not to set up Zork as the paradigm for the form. Zork was certainly important and popular, however; it and the other mainframe works that followed would serve to show that Adventure was not a dead end.