Somewhere Nearby is Colossal Cave
**Examining Will Crowther's Original "Adventure"
in Code and in Kentucky**

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Introduction

"Colossal Cave Adventure" was not the first computer game; nor was it the first game to accept textual commands, nor the first program to emulate something resembling conversation.[1] Still, by using terse, evocative prose to simulate the exploration of a well-defined environment, and later by sharing the source code in order to let other programmers build upon his work, programmer Will Crowther set in motion a series of events that demonstrated the transformative cultural potential of the emerging internet.   "[L]ike any significant program, Adventure was expressive of the personality and environment of the authors" (Levy 133). We know this environment was informal, collaborative, noncommercial, and as one might expect, highly technical. Yet "Adventure" has remained mysterious, in part due to Crowther's self-admitted fuzziness of memory when it comes to dates, and to his personal

choice to keep a low profile.[2] Little evidence has been available to counter

common but faulty assumptions – for instance, that Crowther's original

"Adventure" was a sparse map-like simulation, and that all the magic and gaming

elements were supplied by Don Woods. Inaccuracies are often perpetuated in

published accounts, due to the inaccessibility of two key resources – the original

source code and the original source cave.

The original source code for Will Crowther's original version of

"Adventure," recovered in 2005 from a backup of Don Wood's student account at

the Stanford Artificial Intelligence Lab (SAIL),[3] confirms that Crowther's original

version (internally titled "ADVENTURES") included puzzles (such as the

rod/cage/bird/snake sequence), subtle humor (such as the unexpected

involvement of the caged bird in the solution to the snake obstacle and the wry

responses to some player commands), and fantasy (including the magical

appearance of the crystal bridge and combat with the axe-wielding dwarves).

Yet Crowther's adventures in Colossal Cave began even earlier, with his

membership in the Cave Research Foundation (CRF) -- a group of amateur

enthusiasts who worked together to explore and map the hundreds of miles of

underground networks in Mammoth Cave National Park, in southwestern

Kentucky. CRF records include a number of artifacts that shed light on the pre-

history of "Adventure," including the survey map of Colossal Cave that is

occasionally conflated with Crowther's original Adventure game; expedition

records documenting Crowther's surveying activities and glimpses of his

character; and a personnel manual (with contributions by Crowther) that

describes recreational caving as it was practiced in the mid 70s. With some

feedback from Crowther himself, a compilation of published accounts in print and online, new interviews with many of Crowther's caving associates, co-workers, and family members, and with new insights gained from joining the Cave Research Foundation and participating in an expedition in the real Colossal Cave, it is possible to construct a much clearer understanding of "Adventure" as an artifact of digital culture.

Figure 1: Tourist Caves = Graphical User Interface

Tourist caves are kept clean and orderly. Visitors are carefully shunted along orderly routes. Some feature elevators and access ramps. The tours emphasize visual impact, and visitors are carefully isolated from the potential for uncertainty and confusion. The experience is optimized to meet the needs of large numbers of non-specialists, who would not otherwise experience even a sanitized approximation of a caving expedition.

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Figure 2: Wild Caves = Command Line Interface

Visitors hiking to the Bedquilt Entrance of Colossal Cave are likely to get tired, get ticks, and get lost.

Those who actually make it inside Colossal Cave are likely to get dirt in their eyes, sand in their gloves, and rocks in their boots. The benefit for a serious caver is the ability to choose which route to take, to link up existing routes in new ways, or to seek passages to "virgin cave."

Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

"Adventure" was written for fun and shared for free; it was the cultural

product of an educated, puzzle-loving, and fundamentally altruistic geek culture.

In his editorial in the first issue of *Game Studies*, Aarseth sketches a game studies

manifesto urging scholars to examine not only the huge industrial players who

have made the gaming industry into a bigger economic force than Hollywood, but

also the activities of the "world-wide, non-commercial, collective games movement." Writing of game mods in 2002, Au observed that they "represent the most visible success of the free software movement on the larger culture. For the millions who play computer games, the same ethos of volunteerism and shared ownership that characterizes free software has helped utterly transform the gaming experience and the $8 billion-plus gaming industry" ("Triumph of the Mod"). Ryan articulates her vision of what might happen "if computer games could emancipate themselves from the tyranny of the market," which, as is the case in Hollywood, forces developers to appeal to the broadest audience. Contrasting the high overhead of games with the low cost of producing literature, Ryan posits that "if games could enjoy a comparable freedom of expression, we might see hybrids of literature and games which would place greater aesthetic emphasis on the plot" (fn. 9).

In pondering the future of computer game studies, Poole observes that a generation ago, cinema and jazz studies occupied only marginal spaces in academia a generation ago; yet today, they are today considered respectable subjects for academic examination (13). A close relation of the adventure game, the MUD, has already drawn considerable academic attention.[4] The rhetorical connections between IF and MUDs have not been fully explored, even though the first MUD was a hacked version of a text adventure game. The text-adventure genre, with three decades of history but with so little basic research published, is a promising subject for this kind of digital humanities research. Considered as an emerging literary form or at least a curious textual oddity, interactive fiction has been the subject of sporadic scholarly attention for nearly as long as the genre has

existed.[5]

Many things that "Colossal Cave Adventure" [6] did well in the 1970s —logic puzzles, inventory and resource management, and exploration of a virtual topography—remain staples of modern computer games. Many things that Crowther's "Colossal Cave Adventure" did not implement — complex NPCs, believable AI, dynamic branching plots — still remain extremely hard to do in any genre. An MIT undergraduate project investigating the rise and fall of Infocom interviewed Dan Horn, who observed that the technology for visually presenting a story advanced faster than the storyteller's ability to use that technology; it is far more efficient to get the players to role-play, and thus generate narratives for each other. "[T]he reality of gaming is now EverQuest - massive multiplayer, real time, online, and graphically amazing. This is the market that Infocom was destined to own but let slip through their fingers because of bad business decisions. Imagine if you will Sorceror, Planetfall, and Deadline with the EverQuest engine, amazing... but lost forever" (Briceno et al. 44). In addition to the founders of Infocom at MIT, Scott Adams (founder of Adventure International), Roberta Williams (co-founder of Sierra On-Line) were among the many entrepreneurs directly inspired by their exposure to "Adventure." Williams reportedly had no interest in her husband Ken's computer gaming hobby until she was hooked by "Adventure" (Levy 294-95), and went on to create the first graphic adventure game ("Mystery House").

Much of the recent literary theory to come out of literature departments depends upon the notion that it is permissible and even desirable for a text to mean one thing to one reader and another thing to another; or, to mean different

things to the same reader in different circumstances.[7] In her Ph.D. dissertation

on "Adventure," Buckles notes that the players regularly constructed their own

narratives to connect the sparsely contextualized puzzles they faced. Literary

critics are intimately familiar with this concept of variable interpretations of a

bounded text. Hutcheon, discussing the postmodern privileging of the reader's

interpretive act over the writer's authorial role, offers the textual variability of

interactive fiction as "the most extreme example I can think of" (77). But this is

an entirely different kind of variance than that experienced by somebody who

interacts with a computer program that assembles a unique text on the fly, that

varies according to the stimuli provided by the user (Aarseth, *Cybertext* 3).

Admitting that variable *content* is a defining principle of a cybertext does not,

however, deny that a cybertext is as open as any conventional text to variable

interpretation. To a generation raised on *Star Trek*, Weizenbaum's "Eliza"

(1966) seems unimpressive as an implementation of artificial intelligence; yet

when examined as a controlled expression of the anxieties unleashed by Clarke's

fictional HAL 9000, or when taken as a withering parody of a 1960s touch-feely

psychiatrist (made all the more cutting because it was written in only about 200

lines of easily-comprehensible code), Eliza gains additional cultural and historical

relevance. Poole quotes Richard Darling (a developer with the British company

Codemasters) regarding the cultural impact of Eliza-as-game: "I think, that in the

games world, [artificial intelligence] hasn't to me actually exceeded that

excitement level" (107). But perhaps even more significant is the observation that

humans will reach for anthropomorphic images when confronted with computer

behavior that they do not understand; the tendency to ascribe to a computer

more intelligence that it actually possesses is known as the Eliza effect.

During the early and mid 80s, publishers of text-based computer games had a tactical advantage over their graphics-based competitors. Compared to graphic games, text games were easy to port across the many competing, incompatible platforms. Text-game companies enjoyed another marketing benefit: last year's graphic games dated quickly due to rapid hardware advances, while the last year's text games did not seem old-fashioned. As the PC and the Mac emerged as the dominant hardware, their operating systems increasingly isolated the average PC user from the iterative, turn-based rhythm of the command-line. [8] At the same time, investing programming resources to create text adventures with larger topographies, more complex plots, and more realistic NPCs did not draw the attention of customers as dramatically as the technological improvements made possible by advances in personal computer graphics (Briceno et al. 27).

While text adventures had faded from the marketplace by the early 90s, a quick search of the internet for "XYZZY" (a magic word from "Adventure") or the word "Zork" will reveal that these games are now fondly remembered by many. Books that cover the history of computers abound with testimonials such as the following:

> The day I discovered Dungeon [the mainframe version of Zork] I decided the computer room was the best place at school....We had no color monitors, no videogames to play. Everything here was text, blocky white letters on black screens. Yet the words were

seductive because they revealed a hidden order behind everything…

(Bennahum 106, 108)

In a review of Electronic Entertainment Expo 2000, Au writes: "Lured by the siren song of ever-improving graphics power, terrified by the risks involved with truly unique ideas in gaming, the industry is collectively stumbling along a path well-worn by Hollywood," which uses non-stop action and visual spectacle to compete against itself for the quickest path to the consumer's dollar. A 2002 column in the New York Times suggested that the commercial gaming industry's quest for graphic realism is misguided, and perhaps even at odds with the elemental pleasure of identifying and mastering a set of rules: "One of the major goals of video game systems has been to simulate the real, to create images so lifelike, and movements so natural that there is no sense of artifice," yet paradoxically, "the technology is put in service to creating a world that could very well do without it" (Rothstein).   Observing the joint activities of Hollywood and Silicon Valley, Poole speaks of a

> new pragmatism among video game designers: concentrating on what they alone can provide, rather than chasing the fashionable dream of interactive narrative, or uncritically seeking convergence with the cinema. Instead, especially in their concentration on character, videogames are carefully strip-mining our conventional notions of narrative and storytelling for what can be usefully simulated in their own, utterly different, medium. (Poole 111)

In *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, Janet Murray draws upon *Star Trek*'s flashy, immersive, and conveniently telegenic

plot device, in order reflect on and speculate about electronic storytelling. In *Trigger Happy: Videogames and the Entertainment Revolution*, Poole argues that "The Holy Grail now for story-led videogames is nothing less than the physical modeling of personality" (104), and argues that text-adventures were "the most promising avenue for success in this field" (106) during the 80s, when the computer gaming industry moved to graphics-only games. Poole seems to echo Murray in several salient points, but does not list her in his bibliography, and thus does not engage directly with any of her statements. This is unfortunate, since Poole's intimate knowledge of contemporary gaming culture permits him to probe some gaming issues with more first-person acuity. Perhaps because the scholarly essay does not supply a convenient apparatus for quoting from computer games, Murray draws more from gamer narratives (or from her interpretation of *Star Trek* episodes that depict game-like experiences) than from the games themselves. Eskelin is, however, too harsh when he takes Murray to task for interpreting "Tetris" -- which was created in Russia -- as a metaphorical commentary on disorder in the American workplace. Murray presumably encountered "Tetris" in a disorderly American office, but knowledge of the international legal tussle over the rights to market the game in various Western markets contributes greatly to our understanding of the cultural significance and impact of the game.

Since much of the basic history of "Adventure" has been murky, so too has our ability to assess its impact. "Most commentators and critics of the adventure game genre. . . fail to mention the original *Adventure* at all, and those who do usually date it far off the mark" (Aarseth, *Cybertext* 107). When interviewed,

Crowther sometimes warns that his "grasp of times and history and such is pretty fuzzy" (O'Neill 3). Given the circumstances, it is perhaps understandable why historical accounts are sometimes vague on the subject of "Adventure." In *Joystick Nation*, Herz (10) dates its origin at 1967. In *Trigger Happy*, Poole (18) suggests 1972, a date that appears on many "history of computing" timelines (and, therefore, in countless undergraduate research papers). The following excerpt from a March 2002 GameSpy article is typical of the accounts found online:

> The year was 1972. Crowther, an amateur spelunker distraught over a recent divorce, wanted to create a game that he and his kids could play on the computer together. He whipped up a computer text simulation of the Mammoth Caves in Kentucky... Of course there were no puzzles in Crowther's version, just a mighty underground realm to explore. Enter Don Woods, who found a copy of the game on the primitive Internet. He asked permission to play with the source code and the result was Adventure (sometimes called Colossal Caves). He added treasures to collect, monsters, traps, puzzles, and more.
>
> <http://www.gamespy.com/articles/march02/top30/2419/index.shtm>

Many of the salient points conveyed in the above passage are true. Crowther *did* present his game as a post-divorce gift to his children (although he also shared the game with his Dungeons & Dragons friends); Crowther was a caver (although he told an interviewer, "In those days, the thing I cared most about was rock climbing," [O'Neill 5]); calling Crowther a "spelunker" rather than a "caver" is like referring to DVD-Jon as a "script kiddie" rather than a "hacker"; the game *was* based on one section of the sprawling Mammoth Cave system in south-western Kentucky, which does contains a Colossal Cave, which in turn contains

an entrance named Bedquilt -- the entrance represented in the game); and Stanford University undergraduate Don Woods *did* find a copy of Crowther's abandoned game (not by hacking, but simply by playing a copy that someone else had placed on a computer at the Stanford medical school). Woods did contact Crowther to request the source code, and has estimated a March or April 1976 release date (Cordella) (however, backup tapes retrieved from Woods's student account revealed a copy of Crowther's original code, dated March 11 1977, along with other files that show the first changes Woods made over the next few weeks).

Graham Nelson ponders the of Stephen Bishop, a remarkable young man, who distinguished himself as an explorer and tour guide in the historic Colossal Cave, and whose 1842 map of the cave "was still in use forty years later" (342). Bishop, a slave, was freed in his master's will, but was unable to earn enough to purchase the freedom of his wife and children before he died. Nelson compares Bishop's plight to Crowther's: "It's hard not to feel a certain sadness that the first adventure game was shaped by those two lost souls, Bishop and Crowther, each like Orpheus unable to draw his wife out of the underworld" (344). I'm fairly sure that Bishop wouldn't have compared the caves he loved to the land of the dead; but Nelson is onto something when he identifies the pain surrounding this particular cave, and this particular game. One of Crowther's former caving companions recalled CRF culture in the early 70s in utopian terms, and described the breakup of the Crowthers' marriage as a catastrophic event; this mutual friend was himself clearly still suffering 30 years later. Another caver who was with the Crowthers on an expedition in the summer of 1975 reports that one

glance at "Adventure" was enough to identify it immediately as a cathartic exercise, an attempt by Will to memorialize a lost experience.

Nevertheless, in a 1994 interview, Crowther mentions a wife who is into rock climbing. His daughters say he has been married about 20 years now, and they tell me they would consider his marriage a happy one. Laura particularly praised her father's method of teaching – that is, he would give them gentle hits and tips, but made sure they knew that they would have to solve problems on their own. Playing computer games was always part of visiting their father, and while growing up they regularly played text games. One of Crowther's ongoing projects is the development of a text parser that accepts natural language; he finds writing programs more fun than playing games, and he can still hold his own in rock climbing. I don't think we need to mourn for Will Crowther.

Part I

Exploring Colossal Cave in Code

> It is fun to play computer games, and it is fun to write games
>
> programs. Unfortunately, a program is a program whatever its
>
> function, and a games program will call for the same clear thinking
>
> and attention to detail demanded by any other programming task of
>
> equivalent complexity. (Solomon 10)

His daughter Sandy quotes Crowther as saying, "You know I've done all sorts of wonderful things in my career, it's funny that the one thing I'm remembered for is 'Adventure'." Before Crowther coded the game, and before he helped map the complex network of caverns on which the game is based, he had already secured a place in history for his contributions to a different network. As a member of the team of programmers at Bolt, Beranek and Newbold (BBN) who were commissioned by the U.S. Government to connect distant research computers, he helped to build the computer network that would later be known as the immediate forerunner to the internet.

While BBN was actively researching artificial intelligence at the time, "in reality ["Adventure"] was just some rather simplistic logic and a small table of known words – of course backed up by some very clever thinking," according to Mike Kraley, [9] whose BBN office was across the hall from Crowther's. Kraley joined Crowther as one of about eight long-term participants in an extended, months-long Dungeons and Dragons campaign (along with Eric Roberts as the

dungeonmaster and future Infocom co-founder Dave Lebling). "[O]ne day, a few of us wandered into his office so he could show off his program. It was very crude in many respects - Will was always parsimonious of memory - but surprisingly sophisticated. We all had a blast playing it, offering suggestions, finding bugs, and so forth.... We interacted on it a bit, but once it was working, Will wasn't very interested in perfecting or expanding it." Crowther's original Adventure impressed his colleagues, according to Kraley. "Will was very proud - or more accurately amused - of how well he could fool people into thinking that there was some very complex AI behind the game."

Without Crowther's contributions to the creation of the internet, his own game would not have had a vehicle with which to be come so wildly popular.

> In early 1977, *Adventure* swept the ARPAnet. Willie Crowther was the original author, but Don Woods greatly expanded the game and unleashed it on an unsuspecting network. When *Adventure* arrived at MIT, the reaction was typical: after everybody spent a lot of time doing nothing but solving the game (it's estimated that *Adventure* set the entire computer industry back two weeks), the true lunatics began to think about how they could do it better. (Anderson)

During the late 70s, Tom Van Vleck was a managing engineer at Honeywell. He describes "Adventure" not as a world-changing experience, but rather as one of several occasional fads.

> Even system programmers with unlimited usage accounts were somewhat apologetic about using expensive machines for amusement.... Adventure swept through our group in the mid to

late 70s: some staff members spent many hours at it. Others played

it once or twice, showed it to relatives and friends, and lost interest.

Gaming was not a source of interest in computing, or a way of

recruiting people to the field: it was something we could do with the

machine that was comprehensible to non-computer folks, who were

often baffled about what a computer was and what we did.[10]

Among those who did not lose interest after their first encounter with

"Adventure" were two Stanford graduate students in CS204, Don Woods and

John Gilbert. According to Gilbert, someone in the class (a "programming and

problem-solving seminar") mentioned the game – possibly the instructor, Bob

Floyd – and that night, Gilbert and Woods "stayed up all night at the AI lab

playing the game and mapping the cave, including scanning the binary code for

character strings in order to guess what the possibilities were." [11]

Crowther's PDP-10 Fortran source code, originally written in all-caps due

to the limitations of the PDP-10, appears in two files – one for data, and one for

code that processes the data. The data is organized in six separate tables: 1) long

descriptions, 2) short room labels, 3) map data, 4) grouped vocabulary keywords,

5) static game states, and 6) hints and events. The source code merely numbers

the tables 1 through 6, but I have supplied descriptive titles to help clarify the

following discussion.

Table 1 [Long Descriptions]

Example:

```
    1      YOU ARE STANDING AT THE END OF A ROAD BEFORE A SMALL BRICK
```

```
1       BUILDING . AROUND YOU IS A FOREST. A SMALL
1       STREAM FLOWS OUT OF THE BUILDING AND DOWN A GULLY.
2       YOU HAVE WALKED UP A HILL, STILL IN THE FOREST
2       THE ROAD NOW SLOPES BACK DOWN THE OTHER SIDE OF THE HILL.
2       THERE IS A BUILDING IN THE DISTANCE.
3       YOU ARE INSIDE A BUILDING, A WELL HOUSE FOR A LARGE SPRING.
```

The first table presents long descriptions of game locations. Its 149 lines present

78 separate items numbered from 1-79 (omitting number 26). Items 42-58

represent locations in Crowther's "All Alike" maze, with ten of these having the

description "YOU ARE IN A MAZE OF TWISTY LITTLE PASSAGES, ALL

ALIKE." One describes the one-way exit down to the Bird Chamber, and the

others are marked as "DEAD END".

Some items in this section actually describe unexpected or undesirable

game states, rather than actual locations.

```
20      YOU ARE AT THE BOTTOM OF THE PIT WITH A BROKEN NECK.
21      YOU DIDN'T MAKE IT
22      THE DOME IS UNCLIMBABLE
23      YOU CAN'T GO IN THROUGH A LOCKED STEEL GRATE!
```

The last item in this table offers an alternative to an unsuccessful attempt to
follow the stream when one is inside the small building.

```
79      THE STREAM FLOWS OUT THROUGH A PAIR OF 1 FOOT DIAMETER SEWER
79      PIPES. IT WOULD BE ADVISABLE TO USE THE DOOR.
```

Table 2 [Short Room Labels]

```
1       YOU'RE AT END OF ROAD AGAIN.
2       YOU'RE AT HILL IN ROAD.
3       YOU'RE INSIDE BUILDING.
```

This table holds 27 one-line items, numbered from 1-68, with many gaps. The

entries in Table 1 that describe failures to move to the requested location, such as

items 20-23 above, have no corresponding entry in Table 2. Rooms with a very

short full description, such as room 29 ("YOU ARE IN THE SOUTH SIDE

CHAMBER.") and most maze locations, also have no corresponding entry in the

table of short room labels.

```
18      YOU'RE IN NUGGET OF GOLD ROOM.
19      YOU'RE IN HALL OF MT KING.
33      YOU'RE AT Y2
35      YOU'RE AT WINDOW ON PIT
```

Slightly more than half of the items in this section end with periods, while the rest are unpunctuated.

Table 3 [Map Data]

```
1      2      2      44
1      3      3      12     19     43
1      4      4      5      13     14     46     30
1      5      6      45     43
1      8      49
2      1      8      2      12     7      43     45     30
2      5      6      45     46
3      1      3      11     32     44
3      11     48
3      33     65
3      79     5      14
```

This table links map locations with vocabulary word groups. Experienced

FORTAN coders are invited to look at the source code directly; those who are

unfamiliar with the language may appreciate an informal description of how the

program uses this table to handle player navigation. The first line "1 2 2 44"

means "When in room 1 ("YOU'RE AT END OF ROAD AGAIN"), print out the

strings in Table 1 marked with value 2 ("YOU HAVE WALKED UP A HILL, STILL

IN THE FOREST / THE ROAD NOW SLOPES BACK DOWN THE OTHER SIDE

OF THE HILL. / THERE IS A BUILDING IN THE DISTANCE") if the player

types vocabulary keyword 2 ("ROAD") or vocabulary keyword group 44 ("WEST"

or "W"). The player will then be moved to room 2, which is described in Table 2

as "YOU'RE AT HILL IN ROAD."

The line "3 1 3 11 32 44" represents several ways to get from room 3

("YOU'RE INSIDE BUILDING") to room 1 ("YOU'RE AT END OF ROAD

AGAIN"). The player can type one of several words ("ENTER", "DOOR" and

"GATE") that Table 4 lists with a value of 3; another set of words ("OUT",

"OUTSI", "EXIT", and "LEAVE") with a value of 11; the word "OUTDO[ORS]"

(which has a value of 32) and the words "WEST" and "W" (which we have already

seen carry the value of 44).

The table handles some special events very efficiently. For instance, the

Table 3 [Map Data] line "3 79 5 14" handles what happens when the player is in

room 3 ("YOU'RE INSIDE BUILDING") and types "DOWNS" or "STREAM" – a

reasonable request, but one that the game does not permit. The game prints out

the strings from Table 1 marked with value 79, or "THE STREAM FLOWS OUT

THROUGH A PAIR OF 1 FOOT DIAMETER SEWER / PIPES. IT WOULD BE

ADVISABLE TO USE THE DOOR."   Since the game has refused the requested

action, the player should not end this turn in room number 79 (which does not

exist), but rather should stay in room 3. The Table 3 [Map Data] entry for value

79 is "79 3 1", which we may translate as "When temporarily in fake room 79,

move the player to room 3 if the player has entered vocabulary keyword group 1."

But there is no vocabulary keyword group 1; the vocabulary word groups start

with a value of 2. Just as room 79 is a room the player cannot visit, vocabulary

group 1 represents a keyword that the player can never type. The code is set up to

respond to these values by delivering a customized rejection message (Table 1's

entry 79) and returning the player to the room where the turn started.

The line "3 11 48" will move the player from inside the building (3) to

"YOU'RE IN DEBRIS ROOM" when the player types the keyword 48 – the

famous magic word "XYZZY". Likewise, "3 33 65" describes how the player

moves from inside the building to "YOU'RE AT Y2" (room 33) after invoking the

magic word "PLUGH" (65).

Table 4 [Grouped Vocabulary Keywords]

This long table (193 items) represents every word the game recognizes,

though all input is truncated to the first 5 characters. The first group of 93 lines

stores strings that the game recognizes as attempts to move. These are numbered

from 2-70 with some omissions and many duplicates.

```
2       ROAD
3       ENTER
3       DOOR
3       GATE
4       UPSTR
5       DOWNS
6       FORES
```

The numbering identifies the typed commands "ENTER", "DOOR" and "GATE"

as with number 3, marking them as synonyms.   The last item in this section,

numbered 70, is "BEDQU". Most of these words are the names of specific

locations, but words for general motion ("BACK", "RETUR" and "RETRE") are

also on the list. [12]

While navigation by compass directions is perhaps one of the most

recognizable features of the text-adventure genre, the compass directions were

added relatively late to the data file. Thus, dozens of names for locations from the

initial above-ground sequence ("HOUSE", "GATE", "FORES[T]") and words

associated with a more linear navigation style ("FORWA", "BACK", "ENTER" and

"EXIT") are numbered 2-26, with synonyms such as "NULL" and "NOWHE"

sharing numbers. Terms for the concepts "UP" and "DOWN" and several

synonyms appear at numbers 29 and 30, respectively, while the four cardinal

compass directions appear in numbers 43-46, and the diagonals at 60 and 62-64.

William F. Mann, a CRF member who "helped a bit with the mapping of the

Bedquilt area" recalls playing "several versions of ADVENTURE as they were

being developed". [13] According to Mann, the game had always included compass

directions; he suggests that the late appearance of the compass directions in the

vocabulary table may simply indicate at what point Crowther moved that feature

from the code file to the data file. Further, items 10, 11 and 14 in Table 6 are all

response messages printed when the player is having trouble navigating; all three

mention navigation by compass points before navigation by nearby objects. (For

instance, item 10: "I AM UNSURE HOW YOU ARE FACING. USE COMPASS

POINTS OR NEARBY OBJECTS.")

A second group of 35 items, numbered from 1001-1023 with some

omissions and duplication, represents objects, including props that can be picked

up (the keys and various treasures), scenery items that affect the player's motion

(the rough stone steps and the fissure in the Hall of Mists), and adversaries (the

snake and the dwarves).

```
1001   KEYS
1001   KEY
1002   LAMP
1002   HEADL
1003   GRATE
1004   CAGE
1005   ROD
1006   STEPS
```

Item 1018 and item 1022 are both given as "KNIFE", but only item 1018 is set up

to accept the synonym "KNIVE".

A third group of 53 lines covers 16 more commands, including 12 synonyms for "TAKE" (the last of which is "GET"), five for "RELEA[SE]", and nine for "WALK". An unusual grouping of words treated as synonyms is the following:

```
2010  CALM
2010  WAVE
2010  SHAKE
2010  SING
2010  CLEAV
```

An examination of this table reveals several insights. Crowther's original version contains no vocabulary words to represent commands for saving a game, reporting the score, or taking inventory of possessions; all of those game elements were added by Woods. Further, the word "BOTTL" and the word "WATER" both have the number 1020, indicating they are treated as the same object. Since the last prop in this list is 1023, the numbering suggests Crowther added the bottle at a late stage in the game's development. There are table entries words for "POUR" and "DRINK", both of which will set a flag that indicates the bottle is empty; but there are no commands for refilling the bottle. (In Woods's version, when the player first encounters the bottle it is empty, and it can be filled with water or oil. See brief notes on the Woods expansions, below.)

While Adventure lore commonly reports that Crowther created the game in order to share it with his young daughters, the list of keywords recognized by the game suggests that Crowther also programmed it to respond to commands likely typed only by frustrated adult play-testers. The keyword with the highest ID -- presumably the last one added -- is a four-letter expletive.

Table 5: [Static Game States]

```
201     THERE ARE SOME KEYS ON THE GROUND HERE.
202     THERE IS A SHINY BRASS LAMP NEARBY.
3       THE GRATE IS LOCKED
103     THE GRATE IS OPEN.
204     THERE IS A SMALL WICKER CAGE DISCARDED NEARBY.
205     A THREE FOOT BLACK ROD WITH A RUSTY STAR ON AN END LIES NEARBY
```

This short table (24 items) includes short descriptions of game states that make

lasting changes to the environment. Thus, every time the player enters a room

that contains the keys, a message indicating the presence of the keys will be

printed. Some of these items describe objects, some describe barriers, and others

describe room features. Exclamation points emphasize the importance of

treasure and the presence of the snake.

```
209     ROUGH STONE STEPS LEAD UP THE DOME.
210     THERE IS A LARGE SPARKLING NUGGET OF GOLD HERE!
11      A HUGE GREEN FIERCE SNAKE BARS THE WAY!
112     A CRYSTAL BRIDGE NOW SPANS THE FISSURE.
```

The numbering here is not sequential, because the hundreds digit is used to
indicate an alternate state – item 3 defines the locked grate, and item 103 defines
the unlocked grate. (At this point I am not sure why some items have a 2 in the
hundreds column.)

Table 6 [Hints and Events]

The final table in the data file, 132 lines long, contains 80 numbered groups of

lines that offer hints and descriptions of one-time game events (rather than

enduring state changes, as Table 5 contains).

```
1       SOMEWHERE NEARBY IS COLOSSAL CAVE, WHERE OTHERS HAVE FOUND
1       FORTUNES IN TREASURE AND GOLD, THOUGH IT IS RUMORED
1       THAT SOME WHO ENTER ARE NEVER SEEN AGAIN. MAGIC IS SAID
1       TO WORK IN THE CAVE.  I WILL BE YOUR EYES AND HANDS. DIRECT
1       ME WITH COMMANDS OF 1 OR 2 WORDS.
1       (ERRORS, SUGGESTIONS, COMPLAINTS TO CROWTHER)
1       (IF STUCK TYPE HELP FOR SOME HINTS)
2       A LITTLE DWARF WITH A BIG KNIFE BLOCKS YOUR WAY.
3       A LITTLE DWARF JUST WALKED AROUND A CORNER,SAW YOU, THREW
3       A LITTLE AXE AT YOU WHICH MISSED, CURSED, AND RAN AWAY.
```

Brief Notes on the Woods Expansion

Mann's assessment of the Crowther/Woods collaboration offers an apt

summary: "Crowther was interested in using the cave as a setting for a game, with

magic, puzzles, conflict, and humor. Woods carried that forward, but without the

feel for being in an actual cave, and with a need to limit the use of the machine to

off hours. He added mostly policy, puzzles and humor." While a full analysis of

Don Woods's contributions is beyond the scope of this paper, a few brief notes

may give some useful insights into the composition process that led to the

"Adventure" that is commonly known today. Woods retained the general

structure of the code when he expanded the game, typically adding on to the end

of the existing tables, and squeezing creative variations out of Crowther's general

structure.   For example, Crowther's original responds to the command "BLAST"

with the message "BLASTING REQUIRES DYNAMITE," and Woods

incorporated the "BLAST" command into his explosive finale. Woods also

reworked several parts of Crowther's code in order to accommodate the extra

complexity Woods implemented. In terms of the textual descriptions of rooms

and actions, Crowther's writing was very tight, occasionally omitting periods if a

thought was already closed off by a line break or closing parenthesis. Woods

corrected several typos in the data file (such as "EXCIV" as a synonym for "DIG")

and made slight revisions to two of the longest textual passages.

Key:

- Replaced by Woods
- Edited by Woods
- Added by Woods

Table 1: Comparison of Instructions Text

Crowther, 1975-76	Crowther/Woods, 1977
SOMEWHERE NEARBY IS COLOSSAL CAVE, WHERE OTHERS HAVE FOUND FORTUNES IN TREASURE AND GOLD, THOUGH IT IS RUMORED THAT SOME WHO ENTER ARE NEVER SEEN AGAIN. MAGIC IS SAID TO WORK IN THE CAVE. I WILL BE YOUR EYES AND HANDS. DIRECT ME WITH COMMANDS OF 1 OR 2 WORDS. (ERRORS, SUGGESTIONS, COMPLAINTS TO CROWTHER) (IF STUCK TYPE HELP FOR SOME HINTS)	SOMEWHERE NEARBY IS COLOSSAL CAVE, WHERE OTHERS HAVE FOUND FORTUNES IN TREASURE AND GOLD, THOUGH IT IS RUMORED THAT SOME WHO ENTER ARE NEVER SEEN AGAIN. MAGIC IS SAID TO WORK IN THE CAVE. I WILL BE YOUR EYES AND HANDS. DIRECT ME WITH COMMANDS OF 1 OR 2 WORDS. I SHOULD WARN YOU THAT I LOOK AT ONLY THE FIRST FIVE LETTERS OF EACH WORD, SO YOU'LL HAVE TO ENTER "NORTHEAST" AS "NE" TO DISTINGUISH IT FROM "NORTH". (SHOULD YOU GET STUCK, TYPE "HELP" FOR SOME GENERAL HINTS. FOR INFOR-MATION ON HOW TO END YOUR ADVENTURE, ETC., TYPE "INFO".) - - - THIS PROGRAM WAS ORIGINALLY DEVELOPED BY WILLIE CROWTHER. MOST OF THE FEATURES OF THE CURRENT PROGRAM WERE ADDED BY DON WOODS (DON @ SU-AI). CONTACT DON IF YOU HAVE ANY QUESTIONS, COMMENTS, ETC.

Table 2: Comparison of Hint Text

Crowther, 1975-76	Crowther/Woods, 1977
I KNOW OF PLACES, ACTIONS, AND THINGS. MOST OF MY VOCABULARY DESCRIBES PLACES AND IS USED TO MOVE YOU THERE. TO MOVE TRY WORDS LIKE FOREST, BUILDING, DOWNSTREAM, ENTER, EAST, WEST NORTH, SOUTH, UP, OR DOWN. I KNOW ABOUT A FEW SPECIAL OBJECTS, LIKE A BLACK ROD HIDDEN IN THE CAVE. THESE OBJECTS CAN BE MANIPULATED USING ONE OF THE ACTION WORDS THAT I KNOW. USUALLY YOU WILL NEED TO GIVE BOTH THE OBJECT AND ACTION WORDS (IN EITHER ORDER), BUT SOMETIMES I CAN INFER THE OBJECT FROM THE VERB ALONE. THE OBJECTS HAVE SIDE EFFECTS - FOR INSTANCE, THE ROD SCARES THE BIRD. USUALLY PEOPLE HAVING TROUBLE MOVING JUST NEED TO TRY A FEW MORE WORDS. USUALLY PEOPLE TRYING TO MANIPULATE AN OBJECT ARE ATTEMPTING SOMETHING BEYOND THEIR (OR MY!) CAPABILITIES AND SHOULD TRY A COMPLETELY DIFFERENT TACK. TO SPEED THE GAME YOU CAN SOMETIMES MOVE LONG DISTANCES WITH A SINGLE WORD. FOR EXAMPLE,	I KNOW OF PLACES, ACTIONS, AND THINGS. MOST OF MY VOCABULARY DESCRIBES PLACES AND IS USED TO MOVE YOU THERE. TO MOVE, TRY WORDS LIKE FOREST, BUILDING, DOWNSTREAM, ENTER, EAST, WEST, NORTH, SOUTH, UP, OR DOWN. I KNOW ABOUT A FEW SPECIAL OBJECTS, LIKE A BLACK ROD HIDDEN IN THE CAVE. THESE OBJECTS CAN BE MANIPULATED USING SOME OF THE ACTION WORDS THAT I KNOW. USUALLY YOU WILL NEED TO GIVE BOTH THE OBJECT AND ACTION WORDS (IN EITHER ORDER), BUT SOMETIMES I CAN INFER THE OBJECT FROM THE VERB ALONE. SOME OBJECTS ALSO IMPLY VERBS; IN PARTICULAR, "INVENTORY" IMPLIES "TAKE INVENTORY", WHICH CAUSES ME TO GIVE YOU A LIST OF WHAT YOU'RE CARRYING. THE OBJECTS HAVE SIDE EFFECTS; FOR INSTANCE, THE ROD SCARES THE BIRD. USUALLY PEOPLE HAVING TROUBLE MOVING JUST NEED TO TRY A FEW MORE WORDS. USUALLY PEOPLE TRYING UNSUCCESSFULLY TO MANIPULATE AN OBJECT ARE ATTEMPTING SOMETHING BEYOND THEIR (OR MY!) CAPABILITIES AND SHOULD TRY A COMPLETELY DIFFERENT TACK. TO SPEED THE GAME YOU CAN SOMETIMES MOVE LONG

```
'BUILDING' USUALLY GETS
YOU TO THE BUILDING FROM ANYWHERE
ABOVE GROUND EXCEPT WHEN
LOST IN THE FOREST. ALSO, NOTE THAT
CAVE PASSAGES TURN A
LOT, AND THAT LEAVING A ROOM TO THE
NORTH DOES NOT GUARANTEE
ENTERING THE NEXT FROM THE SOUTH.
GOOD LUCK!
```

```
DISTANCES WITH A SINGLE WORD.  FOR
EXAMPLE, "BUILDING" USUALLY GETS
YOU TO THE BUILDING FROM ANYWHERE ABOVE
GROUND EXCEPT WHEN LOST IN THE
FOREST.  ALSO, NOTE THAT CAVE PASSAGES
TURN A LOT, AND THAT LEAVING A
ROOM TO THE NORTH DOES NOT GUARANTEE
ENTERING THE NEXT FROM THE SOUTH.
GOOD LUCK!
```

Woods added several rooms to Crowther's existing "ALL ALIKE" maze, and also created his own maze, where the passages were "ALL DIFFERENT" and where the gameplay is altered by the addition of a wandering pirate who steals items the player has dropped to serve as reference points. Crowther supplied the original humorous solution to the snake puzzle, but when the player tries to unleash the same feathered fury on Woods' dragon, the results are comically disastrous. While Crowther's bottle begins full of water and can only be emptied, Woods adds complexity to the bottle by making it refillable and capable of carrying oil. Woods also supplied puzzles that require the use of the water and the food (both of which were consumable on Crowther's version but were not required for any puzzles). In a variation on the crystal bridge that the player can conjure up in Crowther's original, Woods adds a second bridge that can collapse. Where Crowther was an efficient minimalist, Woods lavished energy on the scenery. Crowther didn't create corpse objects for vanquished opponents; once dead, the snake and the dwarves simply vanish. Woods, on the other hand, creates separate corpse objects for the dead dragon and the dead bear (as well as the wreckage of the troll bridge). The plant he created exists as two objects – one thirsty and small, the other sated and climbable. In addition to Crowther's "THREE FOOT BLACK ROD WITH A RUSTY STAR," Wooded the starless

"THREE FOOT BLACK ROD WITH A RUSTY MARK." Because Woods added more complexity, he then had to deal with an even greater number of potential events. What happens when a wandering dwarf encounters the bear or the flame-breathing dragon? Crowther's system supplied the parser and established the basic principles of gameplay, leaving Woods free to concentrate on expansion, creative variation, and real-world resource management (such as a system for resuming a suspended game and a password-protected method of restricting access to the game during working hours).

Crowther's writing style is lean and potent, as evidenced by the Table 1 description of room 13: "YOU ARE IN A SPLENDID CHAMBER THIRTY FEET HIGH. THE WALLS ARE FROZEN RIVERS OF ORANGE STONE. AN AWKWARD CANYON AND A GOOD PASSAGE EXIT FROM EAST AND WEST SIDES OF THE CHAMBER."

> While the player is informed that the chamber is "splendid," the text does not explicitly state what emotional effect the height of the chamber or the proximity of the "frozen rivers of orange stone" is supposed to have. Rather, we see this location through seasoned, critical eyes, duly noting the presence of geological wonders, but then immediately evaluating the next possible move, as one must do when exploring in a real cave. As it happens, the "awkward" exit from the Orange River Room is the way back to the surface, and the "good passage" leads deeper into the cave. Without clumsily announcing something like, "The west exit looks so intriguing that you can hardly wait to explore it," the text subtly discourages the player's premature exit, and reinforces the exploratory premise of classic text adventures. By contrast, the description of a room much deeper in the game lavishes nine sentences on an active underground volcano, the heat and noise of which are described a few rooms away. The name of the location is presented as "Breath-Taking View," and the description is mostly a list of geological wonders to support this claim: a "blood-red glare," an "eerie, macabre appearance," the "smell of brimstone," and "sinister apparitions." .... As if this room offers yet another dynamic image to counter the stately effect of Crowther's

"frozen rivers of orange stone," the volcano room features an "immense river of fire" that "crashes...burns... and plummets." (Jerz and Thomas)

"Adventure" succeeds in large part due to the depth and realism of the scenery, which is rendered in concise prose that calls interesting details to the reader's attention, but that also leaves much to the imagination. The "Breath-Taking View" is an exception; co-authored by Gilbert, the graduate student who played Crowther's version of "Adventure" with Woods late into the night, its effusive language not only tells what the room looks like, but explicitly informs the reader what emotions the scene is supposed to invoke (cf. the gorge "FILLED WITH A BIZARRE CHAOS OF TORTURED ROCK WHICH SEEMS TO HAVE BEEN CRAFTED BY THE DEVIL HIMSELF"). When Nelson analyzes the tension between Crowther's austere fantasy vision and the often comical set pieces supplied by Woods, he finds the stylistic conflict an agreeable part of the game's charm. "Stretching a point, you could say that there is a Crowther and a Woods in every designer, the one intent on recreating an experienced world, the other with a really neat puzzle which ought to fit *somewhere*" (345). Woods's most striking diversions from Crowther's style occur on the far side of the troll bridge, a region that is only accessible after the player has found and captured a strangely passive little bird, watched the little bird destroy a fierce snake, conjured up a crystal bridge with a metal rod, encountered magic words that teleport the player, and fought with dwarves whose corpses vanish – all of which comes from Crowther's original. Given this context, the fantasy and storybook elements that Woods supplies (a dragon, a troll, the "FEE FIE FOE FOO" puzzle, a friendly bear) seem perfectly in keeping with the fantasy setting. Somewhat more jarring

are the changes to the cave environment that occur in the Woods expansion, such as 1) the underground volcano, 2) the battery-dispensing vending machine, and 3) announcements from a public address system warning that the cave is closing. Lacking firsthand experience of caves, Woods had to rely upon his own imagination. Yet even they logically extend, respectively, Crowther's use of upon 1) intriguing geography, 2) treasure items, and 3) magic words. Some of Woods' additions, such as the Soft Room and the Chinese Room, seem completely out of place when considered separately; but once it becomes clear that objects found in these two locations work together to solve an inventory puzzle, these two incongruities make perfect sense as gaming elements.

In 1990, Crowther reflected on the success of the game. "And why did 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." (O'Neill 2-3)

Part II

Exploring Colossal Cave in Kentucky

While Woods' expansion of "Adventure" includes a copy of "Spelunker Today," and while numerous sources describe Crowther as a "spelunker," "[c]avers haven't called themselves spelunkers for almost 40 years now. They may belong to the National Speleological Society, but they don't spelunk. They cave. The sport is caving" (Cahill).[14]

On his valuable "Colossal Cave Adventure Page," Adams correctly identifies Colossal as part of the Mammoth system, but he perpetuates a misunderstanding when he writes "the game is not actually based on that cave, but is instead a remarkably faithful reproduction of nearby Bedquilt Cave." In fact, Bedquilt is only "nearby" Colossal Cave in the sense that your back door is "nearby" your house.
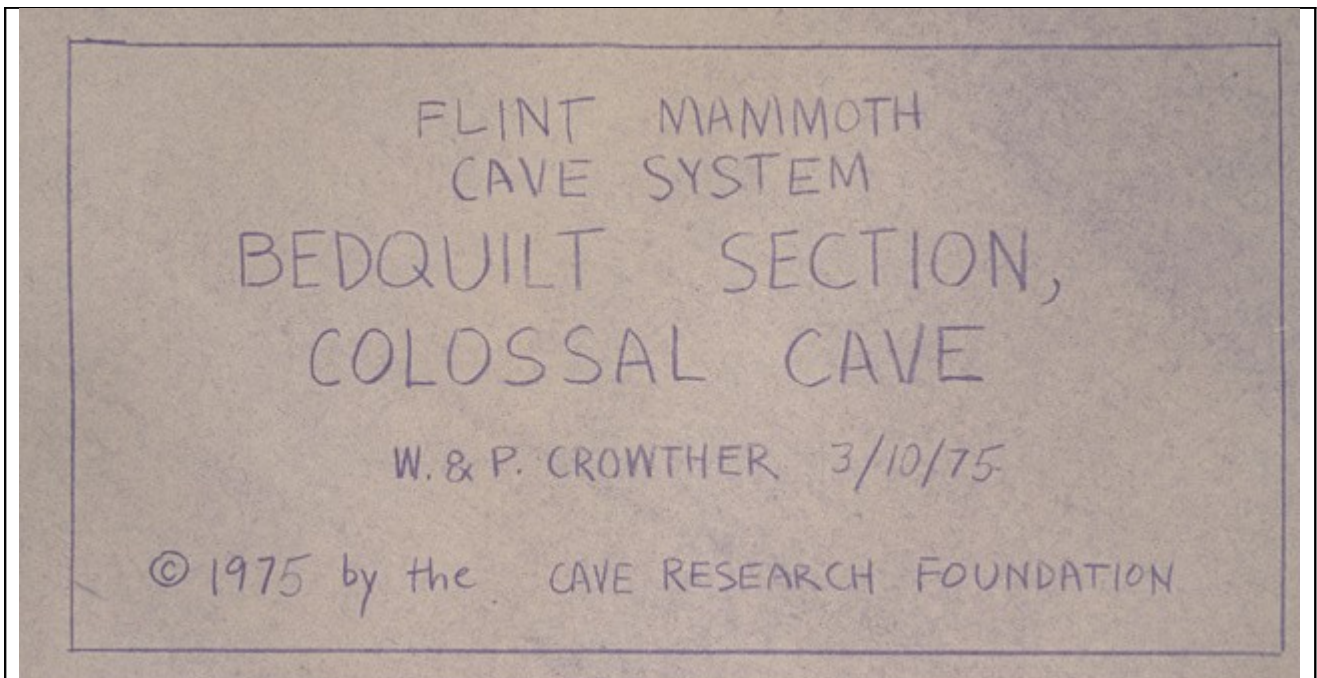
Figure 3: Bedquilt Section, Colossal Cave

The title box of the survey map Will and Pat Crowther completed for the Cave Research Foundation represents Bedquilt as a section of Colossal Cave, rather than a separate nearby cave, as it has often been misunderstood.
Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

Figure 4: Bedquilt Entrance Label

Another detail from the same 1975 map of Colossal Cave, showing the "Bedquilt Entrance"

to the section of Colossal Cave upon which Will Crowther based "Adventure." (The boxed X shows the horizontal grate that leads into the cave.)
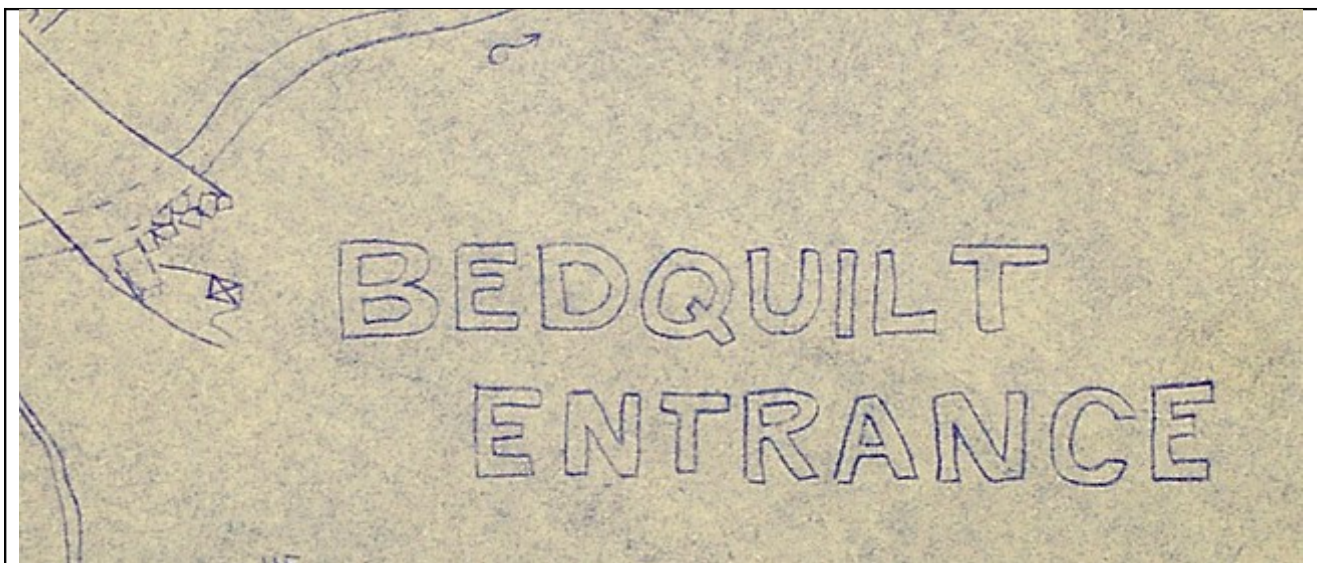**Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.**

Crowther's frequent caving and mapping collaborator was his wife Pat, who in 1972 had distinguished herself in the caving community by making the final connection – that is, physically squeezing through a tiny hole – between two sprawling networks of caverns which had up to that point been considered separate entities. For years, using a compass and a measuring tape, survey teams from the Cave Research Foundation had recorded the coordinates of a sprawling array of 3D points.   The Crowthers used the raw data to form a computer model. According to a Feb 6 1990 alt.folokore.computers posting written by Patricia Wilcox: "We typed in all that survey data from muddy little books on a 110-baud teletype to a PDP-1.... Then generated plotting commands on huge rolls of paper tape, which we carried over and plotted using a salvaged Calcomp drum plotter attached to a Honeywell 316 that was destined to become an ARPAnet IMP."
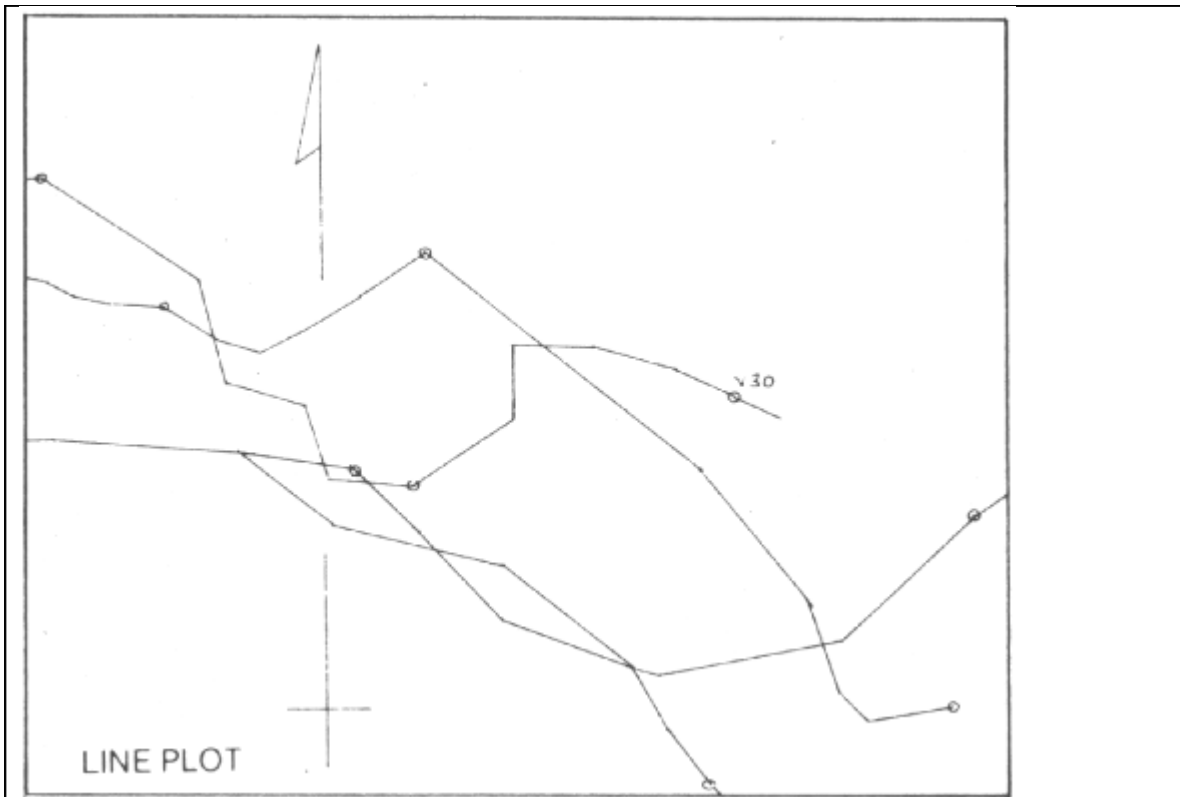
Figure 5: Cave Survey Line Plot

Did Will Crowther create a map-like cave simulation that was later turned into a fantasy role-playing game that we know as "Colossal Cave Adventure"?

This sample line plot of cave survey data was published in Brucker and Watson's 1975 *The Longest Cave*. In 1974, Will Crowther, a volunteer cartographer with the Cave Research Foundation, participated in an intense summer-long survey of the Bedquilt region of Colossal Cave. This sparse line plot has little in common with a text-based exploration game.

While both the graphical map and the textual game represent Crowther's creative efforts to use computer technology to sort and communicate his intimate knowledge of this particular cave system, the two intellectual efforts were otherwise unrelated.

Figure 6: Line Plot and Sketches

Illustration: Using information taken down in sketchbooks by survey teams, Crowther, as volunteer cartographer for the Cave Research Foundati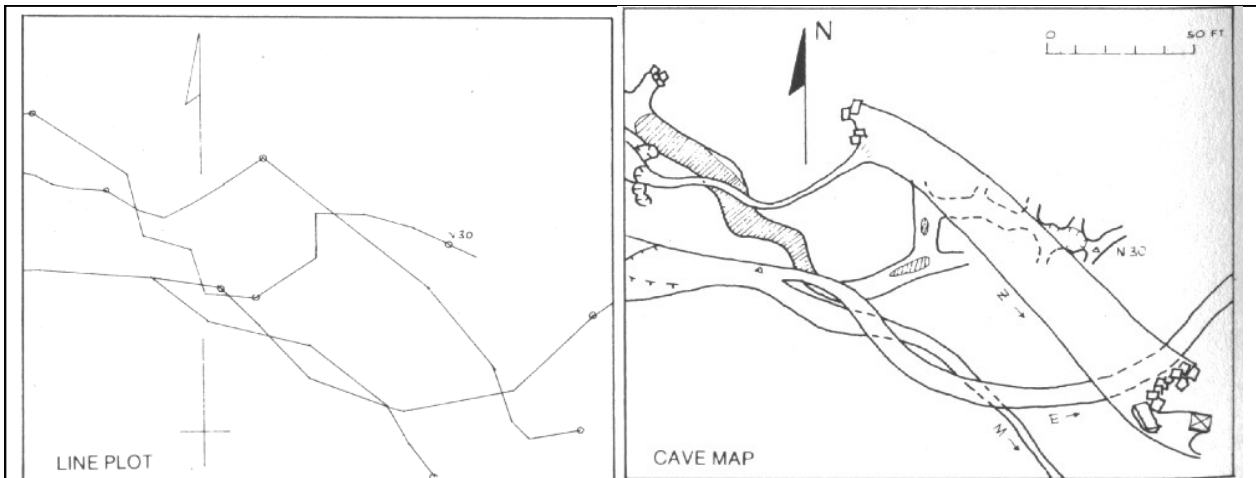on, helped fleshed out the line plot maps (left) into more detailed muti-level environmental maps (right). Surveyors begin at a known location above ground, then use a tape measure and compass to mark waypoints until they reach another known point. Exploring a cave involves following countless promising leads, plenty of which are dead ends, some of which lead to pitfalls, and a few of which lead to a new environment with new choices.

Line Plot and Cave Map © Cave Research Foundation. Published in *The Longest Cave*.

Mapping the Bedquilt region of Colossal Cave involved using the 3D line plots as the framework for hand-drawn details, gleaned from the subterranean scribblings of countless volunteers who had systematically measured and sketched the dimensions of the passages and tunnels along each survey route. While the resulting hand-drawn map can easily be understood as a creative embellishment that makes the stark 3D dataset more accessible and more aesthetically appealing, it is not accurate to consider the text game "Adventure" as a further elaboration of the same data set.

open grate
The grate is now unlocked.

down
You are in a small chamber beneath a 3x3 steel grate to the surface. A low crawl over cobbles leads inward

to the west. The grate is open.

west
You are crawling over cobbles in a low passage. There is a dim light at the east end of the passage. There is a small wicker cage discarded nearby.

get cage
OK

west
It is now pitch dark. If you proceed you will likely fall into a pit.

lamp on
Your lamp is now on. You are in a debris room filled with stuff washed in from the surface. A low wide passage with cobbles becomes plugged with mud and debris here, but an awkward canyon leads upward and west. A note on the wall says "Magic word XYZZY". A three foot black rod with a rusty star on an end lies nearby.

get rod
OK

west
You are in an awkward sloping east/west canyon.

west
You are in a splendid chamber thirty feet high. The walls are frozen rivers of orange stone. An awkward canyon and a good passage exit from east and west sides of the chamber. A cheerful little bird is sitting here singing.

What is a text adventure game? At its core, a command-line computer program that simulates a textual world, accepts input from the player in the form of typed commands, and prints a response that describes whether or to what extent the simulated world changes after each turn. Such games typically involve exploring a simulated landscape, collecting treasures, and overcoming obstacles by solving puzzles or combating simulated opponents.

Illustration: Colossal Cave is one of five networks of caverns that form the Mammoth Cave System. This transcript from Will Crowther's "Colossal Cave Adventure" represents entering the Mammoth Cave System through the Bedquilt entrance to Colossal Cave. The text game and the survey map Crowther created as a Cave Research Foundation cartographer are two completely independent representations of the same real space.

This game directly inspired the MIT-based creators of Zork, who would go on to found the influential 80s gaming company Infocom.

Does "Colossal Cave Adventure" represent a real cave? The first half, written by Will Crowther, accurately reflects Did Crowther base his game on a real cave? Yes.

In the transcript, derived from a session playing the Will Crowther/Don Woods "Colossal Cave Adventure," italicized words represent what the player types.

```
9     YOU ARE IN A SMALL CHAMBER BENEATH A 3X3 STEEL GRATE TO THE
9     SURFACE. A LOW CRAWL OVER COBBLES LEADS INWARD TO THE WEST.
```
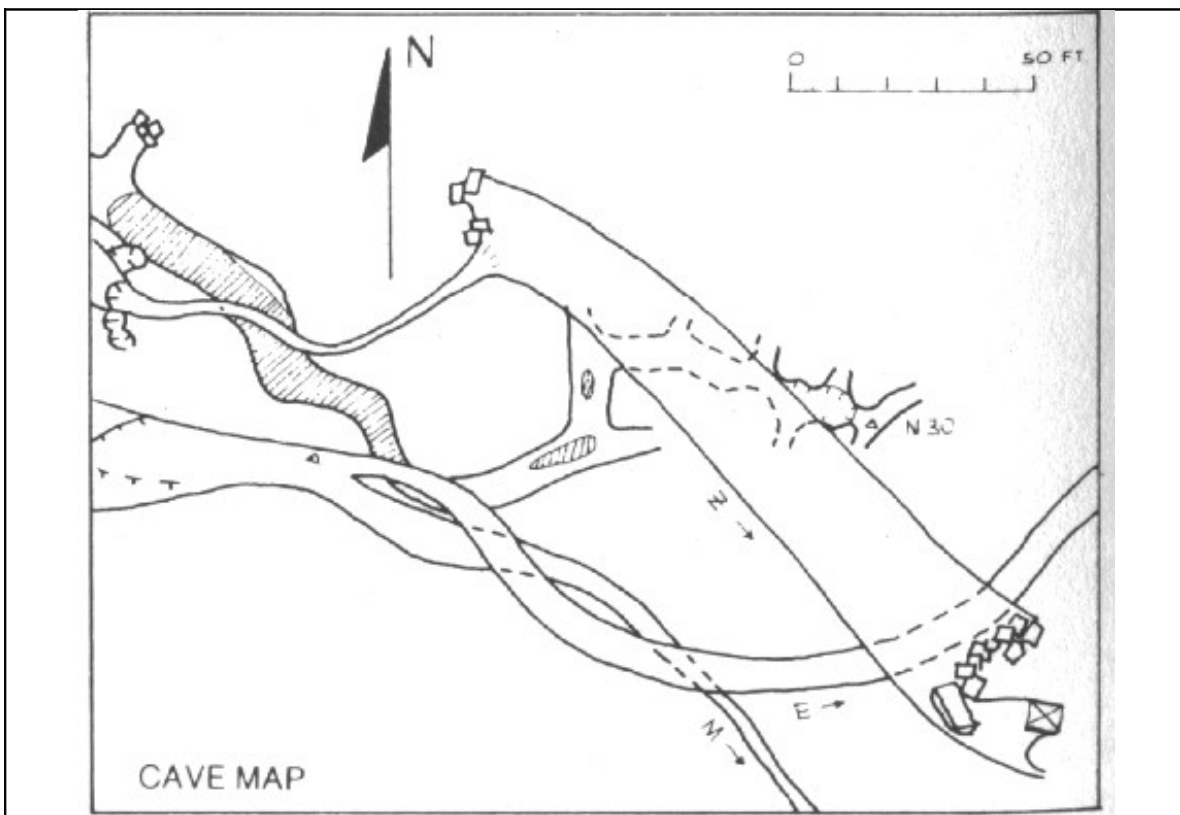
```
10      YOU ARE CRAWLING OVER COBBLES IN A LOW PASSAGE. THERE IS A
10      DIM LIGHT AT THE EAST END OF THE PASSAGE.
11      YOU ARE IN A DEBRIS ROOM, FILLED WITH STUFF WASHED IN FROM
11      THE SURFACE. A LOW WIDE PASSAGE WITH COBBLES BECOMES
11      PLUGGED WITH MUD AND DEBRIS HERE,BUT AN AWKWARD CANYON
11      LEADS UPWARD AND WEST.
11      A NOTE ON THE WALL SAYS 'MAGIC WORD XYZZY'.
12      YOU ARE IN AN AWKWARD SLOPING EAST/WEST CANYON.
13      YOU ARE IN A SPLENDID CHAMBER THIRTY FEET HIGH. THE WALLS
13      ARE FROZEN RIVERS OF ORANGE STONE. AN AWKWARD CANYON AND A
13      GOOD PASSAGE EXIT FROM EAST AND WEST SIDES OF THE CHAMBER.
```

Was Will Crowther's original "Colossal Cave Adventure" a realistic simulation, and did Don Woods add all the fantasy elements in order to make it a game?

Illustration: Excerpt from the source code for Will Crowther's original cave-exploration game. The code was recovered in 2005 from a backup tape of Don Wood's student account at the Stanford Artificial Intelligence Laboratory. The above excerpt includes a reference to the "Magic Word XYZZY." Elsewhere Crowther's original code refers to belligerent dwarves, a surprisingly resourceful bird, and a rusty metal rod with magical powers. Don Woods added a layer of complexity and polish that turned Crowther's code from a brilliant idea into a finished game, but Crowther's humor, fantasy, combat and puzzles had already set a tone that defined the genre.

CAVE MAP

```
                                                            Outside
                                                             grate
      g              g                                        ↑u
      ↑              ↑                          grate         │
      │grate         │grate             ┌──────────────────┐  ↓d
  ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐   ┌──────────┐
  │ Bird  13 │   │Sloping 12│   │Debris 11 │   │Cobble 10 │   │Below   9 │
  │ chamber  │⇄ │E/W canyon│⇄ │  room    │   │  crawl   │   │  grate   │
  ├──────────┤   └──────────┘   ├──────────┤   ├──────────┤   └──────────┘
  │  bird    │                  │  rod     │   │  cage    │
  └──────────┘                  └──────────┘   └──────────┘
      │
      │    Top
      └──▶ small
           pit
```

Map 2

How well the does the geography of the real Colossal Cave (part of the Mammoth Cave System in southwestern Kentucky) match up with the map for Will Crowther's classic text game, "Colossal Cave Adventure"?

Illustration: "Cave Map" (top) shows a detail from the Cave Research Foundation's map of the Bedquilt entrance to Colossal Cave. While Crowther simplified the layout for the game, reducing northwest zigs and southwest zags, and thus permitting the player to progress straight west from the entrance grate (marked with ⊠ in the lower right corner of the "CAVE MAP"), the first half of the game, written by Crowther, is essentially faithful to the real cave.   Of his game, Crowther writes in an e-mail that "the geometry was lifted directly from Bedquilt Cave."   But other cavers, such as Patricia Wilcox and Tom Brucker, have noted differences.

Since Don Woods never visited Colossal Cave, the new rooms and scenic elements he created (such as an underground volcano and a battery-dispensing vending machine) obviously reflect Wood's imagination rather than the real subterranean landscape.

Warren Toomey's "Map 2" is available at http://www.rickadams.org/adventure/maps/advent2.gif. Reproduced by permission.

```
9       YOU ARE IN A SMALL CHAMBER BENEATH A 3X3 STEEL GRATE TO THE
9       SURFACE. A LOW CRAWL OVER COBBLES LEADS INWARD TO THE WEST.
10      YOU ARE CRAWLING OVER COBBLES IN A LOW PASSAGE. THERE IS A
10      DIM LIGHT AT THE EAST END OF THE PASSAGE.
11      YOU ARE IN A DEBRIS ROOM, FILLED WITH STUFF WASHED IN FROM
11      THE SURFACE. A LOW WIDE PASSAGE WITH COBBLES BECOMES
11      PLUGGED WITH MUD AND DEBRIS HERE,BUT AN AWKWARD CANYON
11      LEADS UPWARD AND WEST.
11      A NOTE ON THE WALL SAYS 'MAGIC WORD XYZZY'.
12      YOU ARE IN AN AWKWARD SLOPING EAST/WEST CANYON.
13      YOU ARE IN A SPLENDID CHAMBER THIRTY FEET HIGH. THE WALLS
13      ARE FROZEN RIVERS OF ORANGE STONE. AN AWKWARD CANYON AND A
13      GOOD PASSAGE EXIT FROM EAST AND WEST SIDES OF THE CHAMBER.
```
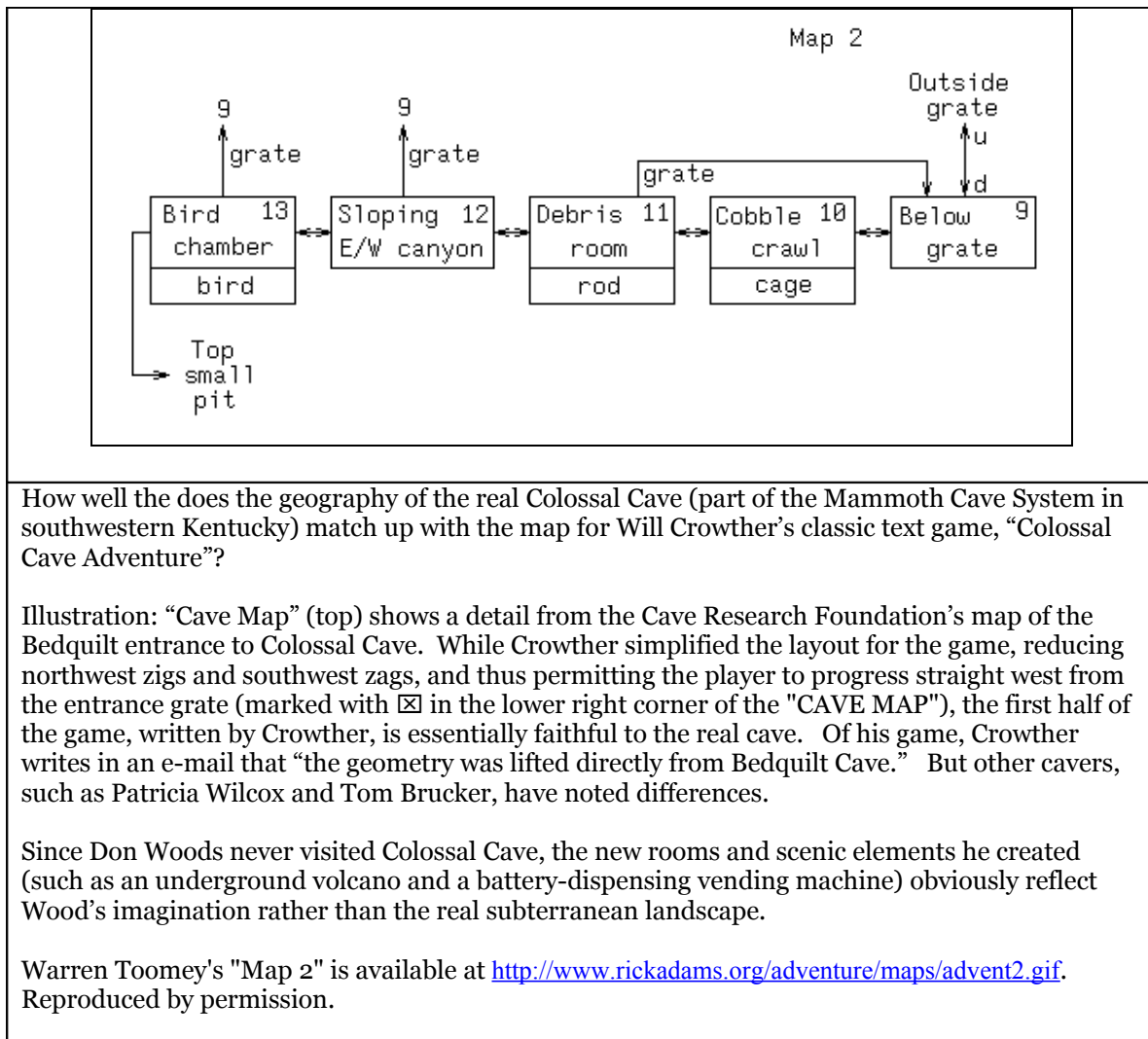
Figure 7: CRF-Toomey-Crowther Mashup

Patricia Wilcox (the former Patricia Crowther) did not know about Will's game

until after she found a copy of the Crowther/Woods collaboration.   She recalls a

CRF meeting in "1976 or 77" in which many members who had ostensibly come to

cave instead spent hours playing the game. She describes the geography of the

game as "Completely different from the real cave. It used names that we made up." Wilcox is likely referring to the sections added by Woods. Other cavers who know the game well report the geography of the game closely matches the geography of the cave. In a 1991 posting to a cavers forum, Mel Park writes that an "Adventure" fan and newbie caver, Bev Schwartz, knew the game so well that, on her first trip into the real cave, "We would be at a junction and she would ask compass directions and then begin to tell us what was down this passage or the other – all correctly!"

Tom Brucker, who caved with the Crowthers while they were mapping the site, reports that Crowther made certain deliberate changes when he created the game. For instance, he invented the fissure that blocks the player's progress at the Hall of Mists, and in order to create the crystal bridge puzzle, he edited out a passage that would have enabled a bypass.

> Will never liked that passage, even though it loops back to the Hall of the Mountain King.....Will based the game on what we purposely called "The Bad map of Bedquilt" Will made a very quick, albiet elegant, map that challenged us during the Bedquilt project to fill in the missing parts. There were plenty of parts missing.[15]

Of the small brick building, built by the U.S. Park Service to house a pump that supplied water for visitors, only the foundation remains.

Figure 8

Cave Research Foundation members in Mammoth Cave National Park, Kentucky, visiting visit the remnants of the small brick building featured in the opening of "Colossal Cave Adventure." Dennis G. Jerz displays a water bottle, shiny brass lantern, and tasty food – three of the items players find in that location during the game. The fourth item -- the key to the entrance gate -- is safely around the neck of party leader Dave West (seated in the background). (Room 2, " AT HILL IN ROAD")

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

While the Cave Research Foundation never kept stores in the pumphouse, in the

game one finds a bottle, a shiny brass lantern, tasty food, and keys inside.

According to the *Cave Research Foundation Personnel Manual,* published in 1975, the U.S. Park Service usually locks entrances to caves in Mammoth Cave National Park, and keys are issued to each small party of cavers (33). Each of these in-game props holds special significance within caving culture.

> In the chapter entitled "Caving Equipment," the handbook [*Cave Research Foundation Personnel Manual*] lists, among other items, "Food" (because cavers typically eat one or two meals on an expedition), a "Container for lamp water," and "Metal carbide lamp." Carbide is a substance that reacts with water to produce a flammable gas. Crowther supplied the game with a lamp, a bottle, and a source of water—but no carbide. Cave Research Foundation member Tom Brucker, who worked with the Crowthers on their intensive 1974 survey of Bedquilt, recalls that when he first played the game, he assumed the brass lantern would run out of carbide fuel, and assumed that winning the game would require finding a fresh supply. *The Longest Cave* illustrates cavers dealing with similar resource- and inventory-management decisions that are a large part of modern role-playing games, as when an experienced caver says, "I never thought a flashlight was worth its weight to carry, it burns out so quickly" (15). (It was Woods who supplied the "Adventure" lamp with a timer that warns the player that the lantern's power is running out, and who also added an underground vending machine—the source of fresh batteries.) Other items that are not implemented as objects in the game, but whose presence is implied, include a pack and a compass. The CRF manual offers a thoughtful soliloquy on the ideal proportions and strap configuration for a cave pack (26), and a whole chapter (authored by the Crowthers) explains the proper use of a compass during a map-making survey. (Jerz and Thomas)

Like the benevolent omniscient narrator of Victorian fiction, the narrator of "Adventure" – the "I" who answers the player's request for help – chooses to divulge certain details and withhold others. Using a publicly-available map, the following details of the region were determined in by Bill Mann in 2004[?], who used to cave with Crowther:

The (closed) road from the Collins House and the Austin house

(now torn down) runs south about one mile to a public road. The

Pumphouse was at the end of another closed road (not shown on

my map) on the other side of that public road about one-half mile

southwest at the Adwell Spring. The Bedquilt entrance is about

another one-half mile southwest, downstream. The Colossal

entrance is about one-half mile westnorthwest of the Bedquilt

entrance, over the ridge.

An experienced caver is typically reluctant to tell outsiders exactly where the

entrances are: "They'll take a flashlight and a clothesline and one or the other will

break or malfunction and then they'll die or have to be rescued, and you'll be

responsible" (Cahill).

The pre-game sequence in "Adventure" that involves wandering around in

the forest looking for the entrance is perfectly in line with the values of caving

culture, but playing the widely-available 1993-4 Inform port of Colossal Cave

Adventure [16] may prompt the player to respond negatively to the "wandering in

forest" sequence.

[I]f you were "really" exploring the area around Colossal Cave, you

would not need to strike out in random directions to learn that one

has to go south in order to move from "At Slit In Streambed" to the

bare rock mentioned in the text. The textual descriptions of the

various playing spaces do not provide enough of the information

that the user needs in order to navigate the space; hence, the

"puzzle" of finding the grate is contrived and annoying. (Jerz,

"Colossal Cave Adventure [c. 1976])

In fact, this navigation problem is not part of Crowther's original game, or of the

Woods expansion. It was created inadvertently in this particular edition of the

game, which (in order to simplify the coding process) eliminated navigation by

location, replacing it with navigation by directions (which has, since Crowther's

day, become the standard convention of interactive fiction). Thus, players of

earlier versions of the game could type "downstream" or "rock" (instead of having

to guess that "south" moves the player in the proper direction from the slit in the

streambed.)

Figure 9: Somewhere nearby is Colossal Cave.

```
YOU ARE IN OPEN FOREST NEAR BOTH A VALLEY AND A ROAD.
```

```
If the player types "EXAMINE TREES" when in the forest, the game will
respond:

THE TREES OF THE FOREST ARE LARGE HARDWOOD OAK AND MAPLE,
WITH AN OCCASIONAL GROVE OF PINE OR SPRUCE. THERE IS QUITE
A BIT OF UNDERGROWTH, LARGELY BIRCH AND ASH SAPLINGS PLUS
NONDESCRITPT BUSHES OF VARIOUS SORTS. THIS TIME OF YEAR
VISIBILITY IS QUITE RESTRICTED BY ALL THE LEAVES, BUT TRAVEL
IS QUITE EASY IF YOU DETOUR AROUND THE SPRUCE AND BERRY BUSHES.
```

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

On at least one trip, Pat and Will Crowther found themselves lost in the woods while searching for the Bedquilt entrance. In a Cave Research Foundation trip report dated 30 Jun 1974, party leader Richard Zopf writes:

> We had trouble following the road in and cut down the valley early to find the entrance which was cleverly hidden by mud. Pat and Will scratched their heads and the sand alternately, and soon our shovel scratched the gate, about 1.5 feet down. It is, as one faces the hill, directly opposite the higher hole and next to the left bank. We cleaned the gate and got the old lock to open. The lock should be replaced with a Park service lock next trip. The new lock should be well-oiled. We relocked the gate, ascended the hill, and followed the road all the way back. The ticks were minimal.

An unsuccessful excursion to the Bedquilt entrance of Colossal Cave is such a common occurrence among cavers that it has its own name – "The Bedquilt Rinky-Dink." The first CRF expedition to Colossal Cave in July of 2004 befell the same fate, and returned to camp after a long hike, without finding the entrance. (When I asked, "What am I going to tell everyone when they ask me why we aren't just following the creek bed south from the pumphouse?" CRF

members said that the creek bed would be too overgrown this time of year. Our team had tried to follow a trail that approached the entrance from a different direction.)

A second trip the next day, led by CRF's current cartographer, Dave West, was successful.

Figure 10: Colossal Cave Key

The U.S. Park Service issues keys to small groups of cavers in Mammoth Cave National Park. The Bedquilt Entrance to Colossal Cave looks much more natural than it did when Will Crowther caved here in the 1970s. The picture shows the key to the new gate, which has been set up several hundred feet inside the cave entrance. (Room 8, "YOU'RE OUTSIDE GRATE")

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

The old horizontal gate and the concrete structure in which it was set were

removed in 1994, according to a report filed by the National Speleological

Society.

> Friday the entire Field Camp crew went to the Bedquilt Entrance to
>
> remove the debris from that project. This consisted of the old gate,
>
> a steel monster that took four people to haul up the hill, the broken
>
> concrete from the former gate base and the tools used on the
>
> project. We formed a chain gang part of the way up the hill and
>
> passed the broken concrete from person to person till we reached
>
> the end of the line. Then we moved on up the hill and repeated the
>
> process until the top was reached. The debris was loaded into a
>
> waiting trailer and removed from the area. [17]

After a Mammoth Cave Restoration Field Camp expedition to clean out the remnants of the U.S. Park Service's concrete structure, the Bedquilt entrance was more easily accessible. (Room 9, "Below the Grate.")

Photo by Larry Matiz, 1994. Reproduced by permission.

Figure 11: Using the Bedquilt Entrance

In 2005, the Bedquilt entrance to Colossal Cave was a rather tight squeeze. The sharp edges of some of the debris identify remnants of the concrete structure that used to house the horizontal grate.

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 12: Looking Out the Bedquilt Entrance to Colossal Cave

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 13: Low Crawl over Cobbles

YOU ARE CRAWLING OVER COBBLES IN A LOW PASSAGE. THERE IS A DIM LIGHT AT THE EAST END OF THE PASSAGE.

This passage stretches on for hundreds of feet, often with less than a foot of headroom. It is possible to push the cobbles aside in order to make more room, so the real site is not quite as claustrophobic as the photo might appear. Nevertheless, one quickly becomes attached to the warm orange glow of the shiny brass lantern. In the game, progress beyond this point is impossible if the player does not have the lamp. (Room 10, "YOU'RE IN COBBLE CRAWL")

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

YOU ARE IN A DEBRIS ROOM, FILLED WITH STUFF WASHED IN FROM THE SURFACE.... A NOTE ON THE WALL SAYS 'MAGIC WORD XYZZY'.

Cave Research Foundation members Lynn Brucker and Roger Brucker crouch next to the wall that many cavers believe Will Crowther was thinking of when he put the "xyzzy" message into his game. (Room 11, " YOU'RE IN DEBRIS ROOM.")

In a telephone interview, Crowther's sister Betty Bloom, who was living with Crowther during the 1975-76 year and was one of the original playtesters of "Adventure," recalled an anecdote:

> I do remember my contribution to the game. Do you want to hear? [*Please!*] I was bored having to through all the steps every time, and I said, I want to go directly into the game. [*Dramatic pause.*] "Ecks-why-zee-zee-why!"

According to Bloom, the word XYZZY was a family password. "If the kids ever got lost in an airport, and they ever had to verify who they were, we would just ask them for a magic word, and it would be XYZZY."

Bloom and both of Crowther's daughters pronounced the words by spelling out the letters, but they report that Crowther himself pronounced it "zizzy."

Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

Figure 14: Silt-filled Canyon

YOU ARE IN AN AWKWARD SLOPING EAST/WEST CANYON.

In caver terminology, a "canyon" is any passage that is taller than it is wide. This passage is certainly still awkward, but it has filled with silt since Crowther knew it. (Room 12 [which has no short label].)

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 15: New Vertical Gate

Although the old horizontal 3x3 grate and the concrete structure in which it was set have been removed, the cave is still protected by a locked gate, which in this photograph lies open on the ground. A spray can of oil is stored on a rock nearby. (Room 12 [which has no short label].)

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 16: Cave Formations

YOU ARE IN A SPLENDID CHAMBER THIRTY FEET HIGH. THE WALLS ARE FROZEN RIVERS OF ORANGE STONE. AN AWKWARD CANYON AND A GOOD PASSAGE EXIT FROM EAST AND WEST SIDES OF THE CHAMBER. A CHEERFUL LITTLE BIRD IS SITTING HERE SINGING.

No birds are likely to be found singing this deep in the cave, but the cave formations here do resemble a certain prop associated with the bird.

The colored spots mark survey points.

Figure 17: Birdcage?

THERE IS A SMALL WICKER CAGE DISCARDED NEARBY.

Could this formation in the "Bird Chamber" have given Will Crowther the idea to put a birdcage in the Cobble Crawl?

(Room 13, " YOU'RE IN BIRD CHAMBER.")

Photos by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

aa

Figure 18

A THREE FOOT BLACK ROD WITH A RUSTY STAR ON AN END LIES NEARBY

It's not quite three feet long, there is no sign of the star, and when this photo was taken it was in "Top of Small Pit" rather than the "Debris Room" where Crowther placed it. But there is a rusty rod in the real Colossal Cave.

The star-less "THREE FOOT BLACK ROD WITH A RUSTY MARK ON AN END" was added by Woods.

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 19: Looking Down the Small Pit

AT YOUR FEET IS A SMALL PIT BREATHING TRACES OF WHITE MIST. AN EAST PASSAGE ENDS HERE EXCEPT FOR A SMALL CRACK LEADING ON.

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 20: In the Hall of Mists, looking up towards Top of Small Pit.

Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

Figure 21: Hall of Mists

YOU ARE AT ONE END OF A VAST HALL STRETCHING FORWARD OUT OF SIGHT TO THE WEST. THERE ARE OPENINGS TO EITHER SIDE. NEARBY, A WIDE STONE STAIRCASE LEADS DOWNWARD. THE HALL IS FILLED WITH WISPS OF WHITE MIST SWAYING TO AND FRO ALMOST AS IF ALIVE. A COLD WIND BLOWS UP THE STAIRCASE. THERE IS A PASSAGE AT THE TOP OF A DOME BEHIND YOU. (Room 15, "IN HALL OF MISTS")

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 22:

YOU ARE ON THE EAST BANK OF A FISSURE SLICING CLEAR ACROSS THE
HALL. THE MIST IS QUITE THICK HERE, AND THE FISSURE IS TOO WIDE TO
JUMP.
A CRYSTAL BRIDGE NOW SPANS THE FISSURE.
(Room 17, "ON EAST BANK OF FISSURE." -- after waving the rod.)

While Crowther's "Colossal Cave Adventure" is quite faithful to the real cave on which
it is based, in order to enhance the game Crowther created a fissure that blocks the
player's progress to the west end of the Hall of Mists. Spanning the fissure is one of the
game's puzzles.

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 23

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

THIS IS A LOW ROOM WITH A CRUDE NOTE ON THE WALL. IT SAYS 'YOU WON'T GET IT UP THE STEPS'.
THERE IS A LARGE SPARKLING NUGGET OF GOLD HERE! (Room 18, "YOU'RE IN NUGGET OF GOLD ROOM.")

A thorough search of a small room south of the Hall of Mists yielded no gold nugget or crude note, but perhaps that was due to a sputtering headlamp.

Figure 24

YOU HAVE NO SOURCE OF LIGHT.

Battery-powered lights were cumbersome and inefficient in the 1970s. The brass lamps that were the favored light source (and which are still popular among traditionalists) contain water in the upper chamber, which drips slowly into a lower chamber filled with calcium carbide. The resulting chemical reaction produces acetylene gas, which burns with a very clean flame. While some modern cavers prefer battery-powered LED lights, carbide lanterns remain popular among traditionalists – in part because the caves are chilly and the open flame is a convenient source of warmth.

Why is the lantern made of brass? The brass reflector makes the orange flame even warmer; further, brass fixtures will not interfere with a delicate compass needle.

Crowther's original version of the game did not include a battery-dispensing vending machine – that was added by Woods. A battery would hardy have been useful to a caver with a carbide lantern.

Nevertheless, Crowther's original does include the command "RUB" and the response "RUBBING THE ELECTRIC LAMP IS NOT PARTICULARLY REWARDING. ANYWAY, NOTHING EXCITING HAPPENS."

Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

Figure 25

Woods was partly right. Crowther's original game included a "SHINY BRASS LANTERN," but it was Woods who added the timer that dimmed the light and created the need for new batteries. While there is no vending machine in the real Colossal Cave, there are actually some old discarded batteries in the Hall of Mists.

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 26

A LITTLE DWARF JUST WALKED AROUND A CORNER, SAW YOU, THREW A LITTLE AXE AT YOU WHICH MISSED, CURSED, AND RAN AWAY.

THERE IS A LITTLE AXE HERE

A cave dweller inspects an old axe head, located in Colossal Cave, in the Hall of Mists.

Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

Figure 27: Stopping for a leisurely lunch in the Hall of Mists.

THERE IS FOOD HERE.

The temperature is about 54 degrees year round, so a hot meal is welcome. Lynn Brucker has eaten a can of fruit, emptied a microwaveable container of noodles into the metal can, and is seen here heating the noodles over the flame of a tiny stove.

Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

Figure 28: Wide Stone Staircase

NEARBY, A WIDE STONE STAIRCASE LEADS DOWNWARD.

In caver terminology, a "hall" is any long space. A "dome" is the roof of a pit when seen from below. But there really are rough stone steps leading down from "At Top of Pit" (though they have mostly collapsed) and a wide staircase (which is in good shape, pictured here, leading down from the Hall of Mists to the Hall of the Mountain King). According to CRF members, the steps date from a time before the Park Service took over management of the site, when a private owner was developing it for tourism.

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

A Visit to the Maze of Twisty Little Passages, All Alike
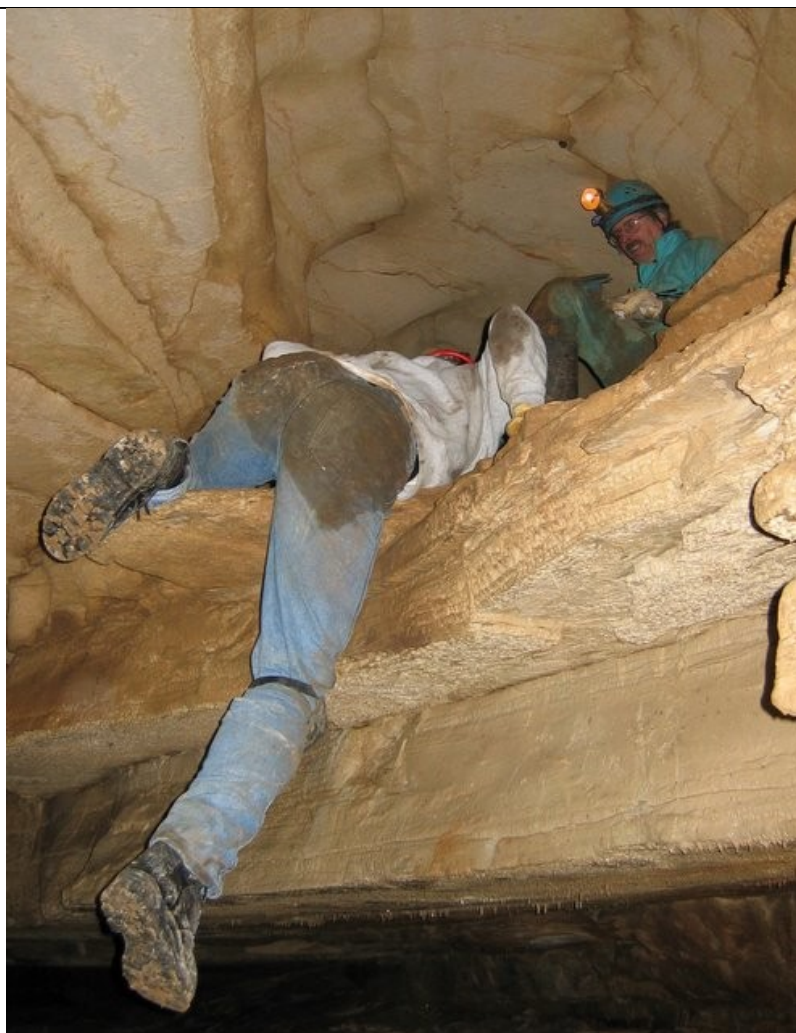
Figure 29

YOU ARE AT THE WEST END OF HALL OF MISTS. A LOW WIDE CRAWL CONTINUES WEST AND ANOTHER GOES NORTH. TO THE SOUTH IS A LITTLE PASSAGE 6 FEET OFF THE FLOOR.

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 30:

(Several rooms, "YOU ARE IN A MAZE OF TWISTY LITTLE PASSAGES, ALL ALIKE.")

Party leader Dave West points out one of several potential ways to get lost.

Figure 33: PLUGH

YOU ARE IN A LARGE ROOM, WITH A PASSAGE TO THE SOUTH, A PASSAGE TO THE WEST, AND A WALL OF BROKEN ROCK TO THE EAST. THERE IS A LARGE 'Y2' ON A ROCK IN ROOMS CENTER.

A HOLLOW VOICE SAYS 'PLUGH'

Y2.mp3

Jerz: All right, well here I am underground with Dave West, Roger Brucker and Lynn Brucker at Y2. Dave, what would you say we're supposed to say at this point?

West: Well… I've tried many ways to pronounce it. Plug, ploog, ploof, pluh. And I'm still here.

R. Brucker: "PLUGH!!"

Jerz: That didn't sound too hollow. It sounded… something.

A Novice Caver's Adventure

Figure 34: Portrait of the Author as a Rookie Caver

Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

...OTHERS HAVE FOUND FORTUNES IN TREASURE AND GOLD, THOUGH IT IS RUMORED THAT SOME WHO ENTER ARE NEVER SEEN AGAIN. (Table 6, Item 1)

The party's computer game specialist must have seemed reasonably competent during his first attempt at applied caving. After leading the party to the Y2 junction, party leader Dave West pointed at this tiny crack in the wall – about a foot high and two feet wide -- and said, "Go that way."

It is one thing to wiggle and squirm through a tight passage when one can always see the figures of several people ahead, silhouetted against the walls lighted by their lamps. It is a much more stressful experience to plunge ahead towards the darkness that lurks, grue-like, beyond the flickering edges of sight.

Figure 35

YOU ARE AT A WINDOW ON A HUGE PIT, WHICH GOES UP AND DOWN OUT OF SIGHT. A FLOOR IS INDISTINCTLY VISIBLE OVER 50 FEET BELOW. DIRECTLY OPPOSITE YOU AND 25 FEET AWAY THERE IS A SIMILAR WINDOW. (Room 35, "YOU'RE AT WINDOW ON PIT")

The roof of the narrow passage opened up before long, and then the bottom dropped away. The destination turned out to be "Window on Pit."

In caving terminology, a horizontal passage makes a "window" when it intersects with a larger vertical shaft.

Photo by Lynn Brucker, © Cave Research Foundation 2005. Reproduced by permission.

Figure 36: Composite photo showing the view across pit.

Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by

A view of the "window" across the pit. Not nearly as volcanic or diabolical as the "BREATH TAKING VIEW" from the Crowther/Woods collaboration, but certainly a stunning destination.

Crowther created room 35, the first "YOU'RE AT WINDOW ON PIT." Woods created the room on the other side of the pit, room 110, also called "YOU'RE AT WINDOW ON PIT," and the shadowy figure who waves back at you.

Figure 37: Looking down from "Window on Pit"

The explanation Woods provides for the opposing window phenomenon exemplifies how he remained faithful to the spirit of Crowther's original, while at the same time introducing comic tension with the natural environment. The photo shows the bottom of the pit, a room that was only implied in Crowther's game, but which Woods created; the description of that room includes the following detail:

> SUSPENDED FROM SOME UNSEEN POINT FAR ABOVE YOU, AN ENORMOUS TWO-
> SIDED MIRROR IS HANGING PARALLEL TO AND MIDWAY BETWEEN THE
> CANYON WALLS. (THE MIRROR IS OBVIOUSLY PROVIDED FOR THE USE OF THE

DWARVES, WHO AS YOU KNOW, ARE EXTREMELY VAIN.) SMALL WINDOW CAN BE SEEN IN EITHER WALL, SOME FIFTY FEET UP. (Woods's Room 109, "YOU'RE IN MIRROR CANYON.")

Photo by Dennis G. Jerz, © Cave Research Foundation 2005. Reproduced by permission.

Figure 38

YOU ARE ON THE BRINK OF A SMALL CLEAN CLIMBABLE PIT.
A CRAWL LEADS WEST. (Room 37)

MIST IS A WHITE VAPOR, USUALLY WATER, SEEN FROM TIME TO TIME IN
CAVERNS. IT CAN BE FOUND ANYWHERE BUT IS FREQUENTLY A SIGN OF
A DEEP PIT LEADING DOWN TO WATER. (Table 6, Item 69)

permission.

Figure 39

Cavers have a wry sense of humor and an easy communal nature. While mountain climbers who pause to rest before making the return trip can focus on the view, the CRF members rested and told stories at "AT BRINK OF CLIMBABLE PIT." When it was time to go, west turned the newest member of the party – a directionally-challenged caving theorist who has trouble finding his car in the school parking lot – and said, "You're going to lead us out."

And he was serious.

> ...ALSO, NOTE THAT CAVE PASSAGES TURN A LOT, AND THAT LEAVING A ROOM TO THE NORTH DOES NOT GUARANTEE ENTERING THE NEXT FROM THE SOUTH. GOOD LUCK! (Table 6, Item 51)

"Before long, team leader Dave West hesitated at a junction. 'You'll notice I'm not following you anymore,' he said, prompting Jerz to backtrack and choose another route. After a few more similar false starts, Jerz finally realized that the proper direction from that junction was *straight up*..." (Jerz and Thomas)

Coda: Adjusting the "Adventure " Timeline

Early timelines of computer and gaming history and numerous sources suggest that Crowther's original game was abandoned as early as 1972, that Woods released his updated version in 1976. Both dates are incorrect.

Recent interviews with Crowther and his family members (children, sister and ex-wife) all confirm that the game was created after the divorce, which they all say happened in mid-1975.[18] Betty Bloom, Crowther's sister, was spending her sabbatical with Crowther during the time he created the game, and was a regular playtester. When asked to check her records, she replied emphatically: "Adventure was created during the academic year of 75-76." All the evidence for the creation of "Advent" is entirely consistent with that date range. In separate telephone interviews, Crowther's children Sandy (born in 1967) and Laura (born in 1970) recall being 8 and "less than 6," respectively, when they first played the game, while staying with their father during a vacation from school.

The false date of 1972 seems to have attracted many compilers of timelines and internet histories, possibly because it is the date usually ascribed to Gregory Yob's creation of "Hunt the Wumpus." Responding to a direct request via e-mail, Crowther dated his original Adventure to 1975, "give or take a year." Numerous accounts of "Adventure" accurately tie its creation to Crowther's reaction to a sudden divorce. Crowther and his family members (sister, children, and ex-wife) all confirm that the game was created after the divorce, which they all say happened in 1975.[19] After the divorce, Crowther

suddenly found himself seeing his two small daughters only on holidays. Feeling isolated from them, and also seeking something clever to share with his "Dungeons and Dragons" friends, Crowther wrote a computer program that textually re-created a small section of the Bedquilt region of Colossal Cave. The result, "Adventure" (c. 1975-76), invented the genre that would later be known as the "text-adventure game" or "interactive fiction." (Jerz and Thomas)

Crowther recalls creating "Adventure" over a period of several weekends; likewise, his daughters recall watching the game develop across a span of several different school vacations, when they lived with their father. None of the family members remembers which school vacations were involved. He had stopped working on it by the time Woods contacted him to request the source code. In fact, his wife had no idea that the game even existed until after the break-up. In telephone interviews, Crowther's older daughter Sandy (born in 1967) recalled being 8, and his younger daughter Laura (born in 1970) recalled being "less than 6" (although Crowther's older daughter and his sister both estimate that she had already turned 6, which would place the creation of "Adventure" after January of 1976). According to Laura: "I think 1972 is early -- I would have been 2."

In a 1990 interview, Crowther describes himself putting a copy of the game on his BBN computer, leaving for a month's vacation, and returning to find the game being played all over the internet (O'Neill). Woods has, in interviews, given March or April of 1976 as the date he released his expansion; but the oldest Adventure-related files (retrieved from a backup tape of Woods's student account at Stanford) bear the date March 11, 1977.

This new timeline compresses several of the key events, resulting in an even faster trajectory for the advance of the new genre. A revised, more accurate timeline sees Crowther probably ceasing work on his original game early in 1976. Crowther's memory of Adventure having gained a following a month after he left Boston for a vacation is validated by the fact that one of these early fans placed it on the computer at Stanford where Woods would eventually encounter it. Some time before March 11, 1997, Woods contacted Crowther to request the source code, and Crowther sent it to Woods. The March 23 code file was some 20 lines longer; the March 31 data file is no longer, but some vocabulary items have been renumbered. The March 31 files are not significantly different from the March 11 files. As late as March 31 of 1977, then, we see no evidence of Crowther's expansion. Yet by before the end of May, the MIT hackers had solved what is now known as the 350-point Woods expansion, and "the true lunatics began to think about how they could do it better" (Anderson), and by June, "Zork" had taken recognizable form. When one considers that this time frame also comprises the May 25 release of "Star Wars" and the June 5 sale of the first Apple computers, it is not likely that any other time period has so shaped so many different facets of geek culture.

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[1] In *Twisty Little Passages: An Approach to Interactive Fiction,* Montfort aptly traces the influence of Adventure's precursors, such as "ELIZA," "SHURDLU," and "Hunt the Wumpus" (the latter of which was also set in a cave). Montfort admirably clears up much of the scholarly confusion regarding what has been known about the composition of "Adventure" and its influence on the founders of Infocom.

[2] His older daughter Sandy ponders her father's fame: "It's funny thinking of him as the J. D. Salinger of interactive fiction... to me, he's just my dad."

[3] At my request, Les Earnest (SAIL executive officer, 1965-1980) and Bruce Baumgart (former Stanford Ph.D. student, now an employee of the Internet Archive) and Martin Frost (systems manager of Stanford's CS department) kindly facilitated the search for a backup tape that contained files from Don Woods's student account. The contents of the tape were made available to Woods, who graciously supplied what he identified as a Fortran 4 version of Crowther's original game, in two files dated March 11, 1977; as well as three more files from March, showing some of the first changes Woods made in both the data and the code.

[4] There is far too much MUD-related scholarship for me to catalog here, but see Turkle's *Life on the Screen.*

[5] See Jerz, "An Annotated Bibliography of Interactive Fiction Scholarship."

[6] Will Crowther's original text game, circa 1975; expanded and re-released by Don Woods in 1976.

[7] Consider also Andrew Plotkin's "Freefall," an Inform version of "Tetris." This text game, created as a joke, begins with the following words: "You wake up. You have no memory of who you are, or where you are, or what you have been doing. A peculiarly vibrating, tinny music pours from an invisible source. Then you see the tremendous chunk of stone falling towards you...."

[8] 90% of computer games are played on consoles that don't even have keyboards, according to Poole (108).

[9] E-mail from Mike Kraley, 27 Feb 2004.

[10] E-mail from Tom Van Vleck, 01 Feb 2001.

[11] E-mail from John Gilbert, 13 Apr 2005.

[12] Crowther explicitly states that most of the game's vocabulary is used in navigation: "MOST OF MY VOCABULARY DESCRIBES PLACES AND IS USED TO MOVE YOU THERE." (Excerpt from Item 51 in Table 6.)

[13] E-mail from William F. Mann, July 30, 2003.

[14] A bumper sticker and T-shirt slogan often seen in caving country reads "Cavers rescue spelunkers."

[15] E-mail from Tom Brucker, April 4 2005.

[16] Ekman, Donald, David M. Baggett and Graham Nelson. Reconstuctors. "Adventure: The Interactive Original." Inform Z-file. 1993-94. <http://www.ifarchive.org/if-archive/games/zcode/Advent.z5>

[17] National Speleological Society. "Mammoth Cave Restoration Field Camp 1994" <http://www.caves.org/io/mcrg/Camp_Reports/1994.htm> 04 Feb 2006

[18] Various e-mail and telephone interviews with Crowther, his ex-wife, their daughters, and Crowther's sister.

[19] Personal e-mail and telephone conversations with Crowther, his sister, his daughters, and his ex-wife.