



Interactive Fiction

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Interactive Fiction

Anthony J. Niesz and Norman N. Holland

“Shall I rig the boarding nets, Sir?”

This was the sailing master, Mr. Stayson . . .

Although the little bay was on the French mainland, it was centered in a deserted stretch of coast, and the likelihood of a boarding party being sent against them was remote.

Niesz turned to Mr. Stayson. “Never rig boarding nets this close to shore.”

“Yes, Sir.” Stayson obviously disapproved of this decision but knew better than to pursue the matter with his captain.

“Shall I rig the boarding nets, Sir?”

This was the sailing master, Mr. Stayson . . .

Although the little bay was on the French mainland, it was centered in a deserted stretch of coast, and the likelihood of a boarding party being sent against them was remote.

Holland turned to Mr. Stayson. “Ay, ay, Stayson. What did you think?”

“Well, it’s like this, Sir.” There followed a few minutes of technical discussion before Stayson went to rig the boarding nets.

The difference between those two undistinguished passages of prose is not very great. The two heroes decide differently about rigging the boarding nets. Slight as it is, though, that difference may embody as fundamental a change for literature as that between a courtly audience listening to a Chaucer reading and a solitary reader poring over his private copy of *The Faerie Queene*. At the very least, that small difference announces a

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new genre, variously called the “compunovel,” “participatory novel,” “participa-stories,” and—the term we prefer—“interactive fiction.”

“Become a character in a fictional plot!” says one of the shriller advertisements. “After the computer sets the scene, your dialogue determines the outcome of the story. Become the international spy, the macho private eye, the surrogate Sherlock Holmes you’ve always wanted to be! Pilot the supersonic jetliner of your fantasies. Get Interactive Fiction.”¹

The two passages about boarding nets are a more subdued version of interactive fiction. The passages are taken from our—What shall we say?—playing, reading, trying a program by Robert Lafore. The words of the passage down to “turned to Mr. Stayson” appeared on a video terminal. At that point it was up to us as readers or, if you will, players (we were pretending to be the Horatio Hornblower-like captain of H.M.S. *Impetuous*) to decide whether we wanted boarding nets rigged or not. The story *would not continue* until we gave instructions one way or the other. Neither of us being sure what a boarding net was, we each answered the question differently. The story then continued differently, and, if subsequent events called for a boarding rig, Captain Holland had one and Captain Niesz did not. **This is what we mean by interactive fiction: works of fiction which explicitly call upon the reader to interact with them by means of queries or replies, to take an active role in the story, and deliberately to change the development of plot, character, setting, or language along with the author.**

The program that gives rise to such an interactive fiction looks bafflingly different from the usual literary text. It consists of thousands of numbered lines like the following, meaningful only to an initiate:

```

3020 IF INSTR(I$, " YES ") OR INSTR(I$, " SURE ") OR INSTR(I$, "OF
      COURSE") OR INSTR(I$, "ALL RIGHT") OR INSTR(I$, "VERY WELL")
      OR INSTR(I$, "ALRIGHT") OR INSTR(I$, " NATUR") OR INSTR(I$,
      "CERTAINLY") OR INSTR(I$, " OK ") OR INSTR(I$, "O.K") THEN
      YF = 1
3030 IF INSTR(I$, "WHY NOT") THEN NF = 0:YF = 1
3040 IF NF = 0 AND INSTR(I$, " TOO ") = 0 AND ( INSTR[I$, " I AM "]
      OR INSTR[I$, " I'M "]OR INSTR[I$, " IM "]OR INSTR[I$, " I AM "]OR
      INSTR[I$, " I'M "]OR INSTR[I$, " IM "]OR INSTR[I$, " THANK"]) THEN
      YF = 1
3050 IF INSTR(I$, "GO AHEAD")OR INSTR(I$, " AYE ") THEN YF = 1

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5300 B$= "AND THE LIKELIHOOD OF A BOARDING PARTY BEING
      SENT AGAINST THEMZWAS REMOTE.Z #1 TURNED TO MR
      STAYSON. #"
5310 GOSUB2000:GOSUB1000:GOSUB3000:GOSUB3200
5320 IF NF=1 THEN A$= " #YES, SIR.# STAYSON OBVIOUSLY DIS-
      APPROVED OF THISZDECISION BUT KNEW BETTER THAN TO
      PURSUE THE MATTER WITHZTHIS CAPTAIN.":GOSUB2000:
      GOTO5400
5330 IF YF=1 THEN A$= " #YES, SIR.# STAYSON, OBVIOUSLY
      PLEASED, HURRIED AWAY TOZCARRY OUT THE ORDER.":
      GOSUB2000:GOTO5400
5340 IF WF=1 THEN A$= " #WELL, IT'S LIKE THIS, SIR.# THERE
      FOLLOWED A FEW MINUTESZOF TECHNICAL DISCUSSION BEFORE
      STAYSON WENT TO RIG THEZBOARDING NETS.":GOSUB2000:
      GOTO5400
5350 A$= " #YES, SIR, # STAYSON REPLIED, REGARDING HIS CAP-
      TAINZQUIZZICALLY. #1 REALIZED HE SHOULD HAVEZGIVEN
      A MORE SEAMANLIKE RESPONSE.":GOSUB2000:GOTO54002

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Indeed, the program that makes the text possible is composed in what amounts to a different language from the English of the text itself. It is written in BASIC. True, a reader sufficiently versed in that now very common programming language could decode it—but that would be an altogether different experience from reading the interactive fiction itself. The story one reads on the screen consists of only the relatively few alphabetic strings (words, phrases, or sentences) that the program displays. (A “string variable” stands for an alphanumeric phrase the way x in algebra stands for a number. For example, in line 5300 above, “B\$,” pronounced “B string,” stands for the sentences between quotation marks.)

Further, the interactive fiction can include other kinds of texts besides purely verbal ones. For example, *Cyborg* by Michael Berlyn incorporates a “brief action skill game hidden in [the] plot”—a video game as part of the adventure which is the game or fiction. Marc Blank’s *Deadline*, a detective story in which the reader has to solve a murder mystery, includes in its package some pills found near the body, a photograph of the chalked outline of the corpse, and the lawyer’s letter about the will.

In these fictions, as in the Hornblowery yarn, the reader literally *becomes* the protagonist. In *Deadline* the reader-detective asks questions like “Tell me about your father,” and the suspects answer—or don’t answer—them. The reader issues instructions like “Fingerprint the teacup” or “Answer the telephone” which elicit information from which he directs the next moves of the fiction. As Berlyn says of *Cyborg*, “Instead of identifying with a hero you read about, you become the hero as you play. . . . Both the player and the plot evolve as the game is played.”³

Interactive fiction has become possible only with the advent of high-speed digital computers that are capable of handling words. As a practical matter, for such a genre to have any wide appeal or possibility of commercial success, inexpensive, "personal," or "home" computers had to come into being. Today, a reader can use a home computer that can accept words and manipulate them; one can buy, for about the cost of a conventional book, a form of literature that a few years ago would have sounded like something out of science fiction.

To be sure, one can find rudimentary forms of interactive literature in print. Stretching the point, one could regard alternate endings to any narrative, either from authorial revision (as in *Great Expectations*) or deliberately (as in *The Three-penny Opera*), as interactive. (From time to time, someone writes a novel with different endings which the reader is asked to determine by shuffling the pages or choosing one of several systematic arrangements. "If you decide to search for Carlos, turn to page 5," instructs the book. This type of conditional direction, however, does not yield the sense of true dialogue that one gets from computerized interactive fiction. Such tree-structured novels are closer to a programmed instruction text. In programmed instruction, if a student gets the right answers to key questions, the text will tell her to skip to a question further into the series. She thereby circumvents the parts of the text she already knows.)

Yet another kind of interaction occurred in the celebrated movie at the Czech pavilion of Expo '67, the World's Fair in Montreal.⁴ There the audience was asked to vote, by means of push buttons built into the theater seats, which of two alternative courses of action the film was to follow. Apparently, the implementation of this kind of interactive cinema is quite difficult, since it requires the use of multiple prints and multiple projectors, as well as a way of ascertaining the audience's response. In contrast to interactive fiction, the audience is limited to choosing one of two or three offered alternatives, instead of being free to choose whatever option may occur to the members of the audience. Economic pressures usually require the convergence of the various plot lines, with the result that the audience's choice loses much of its possible range.

Interactive fiction in any large sense could not come into being until the invention of the digital computer. Moreover, the first computer-based interactive fictions were not truly literary at all. They consisted of simple, task-oriented computer games such as "Lunar Lander," in which the player is supposed to set the speed of a rocket so as to land without either crashing or ending up suspended in orbit, out of fuel. Slightly more literary were early games like "Hammurabi," in which the reader assumes the role of the ancient Mesopotamian ruler and decides how much acreage is to be planted, how much food is to be given to the people, and so on. The machine tabulates and reports the results and has the player at the end either revered as a god or assassinated. One

could think of “Hammurabi” as a game made possible by the development of much more serious and complex computer simulations. The simulation of the world economy on a computer system at the Wharton School of the University of Pennsylvania undoubtedly had a strong influence also.⁵ Often, these early games were surreptitious and illicit, since they wasted a valuable resource, computer time on some institution’s or company’s system.

These task-oriented games drew on the astonishing speed of the computer, which made it possible for the machine to redo all its calculations in response to the constantly changing numbers typed in by the player. These games were truly interactive in that they asked players to do things. The computer printed out a simple scenario for the players by way of instructions and then called for numeric, nonverbal responses. Similar but more complicated games of this type include “Star Trek,” modeled after the popular television series, in which the player had to direct the ship and carry on various strategies, or “Civil War,” in which players acted as generals in the American Civil War, using the original historical data as a basis for making multiple-choice strategic or tactical decisions.⁶ These games added illustrations or “graphics” to the text.

They are entertaining, to be sure, or, in the case of “Civil War,” even didactic—one can learn a good deal about the various battles—but any complexities of language (or picture) belonged to the computer alone in its various displays. It offered the players only a very limited range of choices or asked them to respond with numbers. As “joysticks” were developed, mechanical devices that could rapidly put numerical values into the computer as functions of the position of a physical lever, early games such as “Star Trek” evolved into the incredibly fast video arcade games of today, like “Pac-Man” or “Asteroids” or “Tron,” tests of the player’s manual agility rather than her mathematical speed and intuition. The continuing use of the computer in later interactive fiction, however, means that the author of an interactive novel can reach back to these earlier genres and include a game, even a game with the complex graphics of a video arcade.

The great technical achievement of the computer made possible yet another new type of game, this one closer to fiction. Written by Willie Crowther and Don Woods in the early 1960s, the original “Adventure” rolled through the computing community like the hula-hoop.⁷ Today, it exists on virtually every major computer installation in the country, and it is available for almost every brand of microcomputer. In the development of interactive fiction, the original “Adventure” with its legion of imitators and successors is important because, for the first time, the game let the reader answer with words instead of numbers. The reader was no longer limited to numbers or making choices among two or three possibilities (for example, “type Y or N” or “type A, B, or C”).



The typical adventure game prints out (on the video screen) the text of a situation, often one drawn from literature, although nowadays the story may draw on high-resolution graphics (dot displays on the screen) to produce pictures and very soon, now, the computers may draw on video disks to create television-quality illustrations. (Future Tenniels or Phizes will draw with a laser beam.) Many adventures use names, characters, or situations from the “Middle Earth” novels of J. R. R. Tolkien. Another popular source is the “Conan” series of adventure novels from the early 1930s by Robert E. Howard, featuring the muscular, semiclad heroic barbarian Conan, usually accompanied by one or more bronze-brassiered maidens, making his Ulyssean way through the “Hyborean Age,” a pre-historic period of heroism, monsters, and black magic.⁸ (The popularity of the Conan novels for computer games suggests some interesting things about the fantasy lives of computer programmers as a group.) Still other sources are the strategy games like “Civil War” or the “Dungeons and Dragons” games widely played in schools and colleges. Other adventures situate the reader-hero in an insane asylum, the underground rooms of a new planet, a pirate cove—one even asks the player to lay sewer pipe against the depredations of a particularly pesky breed of mice.

In general, the structure is the Quest. The reader-hero sets out along a series of roads or passageways or rooms (one has to sketch a map to have any success at all with these games). She meets various helpers or adversaries; encounters obstacles, aids, or treasures; and finds dead ends or, more likely, that she left something several stages back that she now needs. The player makes successive moves by typing in two-word commands, and if she makes the right moves in the right order at the right time, she may eventually succeed in winning the hand of the fair princess (or in laying the sewer pipe). The player can respond verbally, more or less as she sees fit: GO NORTH, PICK UP SWORD, DRINK POTION, DROP CLOAK, KISS FROG. “Adventure” possessed a relatively large vocabulary. Although the original game could accept or integrate sentences no longer than two or three words from its reader-player, the number of possible combinations among those words was very large.

At every stage of the game, the computer has the player positioned somewhere in the various pigeonholes or “arrays” of its memory. At each location, the program records which items are appropriate or useful and which are not. At each location the computer asks for the player to type a response on the keyboard. Once the player-reader has typed in a brief command, the computer “parses” it. It divides the command into a first and second part. It then checks the first part against its list of commands, words like GET, GO, OPEN, KILL, or EAT, and it checks the second part against its list of objects for these commands, words like PIPE, OGRE, TREASURE, DOOR, or POWER NEUTRALIZER. If the command is a proper command and if the object is a proper object and if the two make a

proper combination (not OPEN OGRE), the computer accepts what the player has typed in. It then checks what the player has done—to see whether or not it is appropriate or useful (meets the conditions of the program) at this location—and it responds accordingly.

The first adventure games, the earliest works of interactive fiction, were rather limited in their ability to accept verbal responses, questions, or commands from the reader. They limited responding sentences to two or three words each. Now, the ability of the computer to accept more natural speech has grown remarkably, and a player can respond to the computer with sentences as complex as “Get everything on the desk except the matches.”⁹ It seems likely that this ability to recognize and act on words supplied by the reader will become increasingly developed and capable of even finer discriminations in the future.

Even within two- or three-word sentences, the number of possible variations is immense. To unlock the cell of the princess (never a prince!), the player may need a key from another location, but to get the key he or she may have had to bribe a guard at a third location, and for that he or she needed a treasure from yet another location—and so on. All these events have to take place in a certain order, against certain pitfalls, sometimes even with a certain timing (for it is possible to have the computer allocate no more than five minutes for the player to get some needed object). Players have been known to spend months solving a particularly engrossing adventure game.

For the development of interactive fiction, the first technical prerequisite was the development of the high-speed digital computer. The second was the development and improvement of natural language processing, that is, the development of the computer's ability to respond to words or other sequences of alphanumeric characters (“strings”). The original BASIC, invented in 1965, appears to have had a string capability even at the beginning, although it did not have the many substring commands of Microsoft BASIC, the dialect of the language most common on home computers in 1983.¹⁰ It is this string capability that makes adventure games and interactive fiction (as in the excerpts of program above) possible.

Interactive fiction, however, profited and will continue to profit from the development of special “string-processing” computer languages like LISP, pioneered at the Artificial Intelligence Laboratory at M.I.T. It was at that laboratory, in 1966, that Joseph Weizenbaum developed the extraordinary program known as ELIZA (named after George Bernard Shaw's Eliza Doolittle who also learned language).¹¹ Perhaps because he was working early in the language-recognition game, Weizenbaum chose the words to which the program was sensitive and the responses it gave to the “player” so as to simulate a nondirective therapist (the “Uh-huh, tell me more” method of Carl Rogers). Since such a role demands little verbal

ingenuity, the dialogues the computer carried on rather startled some early participants. In this dialogue the computer's side is in capitals:

Men are all alike.

IN WHAT WAY?

They're always bugging us about something or other.

CAN YOU THINK OF A SPECIFIC EXAMPLE?

Well, my boyfriend made me come here.

YOUR BOYFRIEND MADE YOU COME HERE—THAT'S INTERESTING.

He says I'm depressed much of the time.

I AM SORRY TO HEAR YOU ARE DEPRESSED.

It's true. I am unhappy.

DO YOU THINK COMING HERE WILL HELP YOU NOT TO BE UNHAPPY?

* * *

WHY DO YOU THINK I DON'T ARGUE WITH YOU?

You are afraid of me.

DOES IT PLEASE YOU TO BELIEVE I AM AFRAID OF YOU?

My father is afraid of everybody.

REALLY, EVERYBODY?

My father is very fearful.

WHAT ELSE COMES TO YOUR MIND WHEN YOU THINK OF YOUR FATHER?

Bullies.

DOES THAT HAVE ANYTHING TO DO WITH THE FACT THAT YOUR BOYFRIEND MADE YOU COME HERE?

ELIZA's responses can sometimes seem uncannily "right," but the program is a simple one that also often blunders:

IS THAT THE REAL REASON?

You're the analyst—you tell me.

WHAT MAKES YOU THINK I AM THE ANALYST—YOU TELL YOU?¹²

Computers can be *very* literal.

The psychiatrist Kenneth Colby drew on Weizenbaum's work to develop the counterpart to the psychiatrist program, PARRY, which simulated the conversation of a paranoid schizophrenic:

How long have you been in the hospital?

ABOUT A WEEK.

Are you depressed?

NO.

Were you taking drugs?

NO.

What is your problem?

PEOPLE MAKE ME NERVOUS.

How do they do that?

THEY STARE AT ME.

Why?

MAYBE THEY DON'T LIKE THE WAY I LOOK OR SOMETHING.

Do you look unusual in some way?

WHY ARE YOU INTERESTED IN MY LOOKS?

Because you said people stare at you.

WELL, SOMETIMES.¹³

A number of psychiatrists agreed they could not distinguish between PARRY and the paranoids they were familiar with, applying the essential feature of the so-called Turing test of artificial intelligence. Perhaps, however, their response says more about psychiatrists than computers or paranoids.

In effect, ELIZA and PARRY represent a sophistication of the simple parsing of the adventure games. ELIZA, for example, might check what its player (or patient or reader) types in against various lists of words or fractions of words: bad states of mind (“depressed,” “unhappy,” “miserable”), positive states of mind (“happy,” “joy,” “cheer”), swear words, references to the analyst, references to a computer, key pronouns (“you,” “your,” “I,” “me,” “mine”), and so on. These lists would have to be arranged in a sequence as to which list the computer would respond to first. That is, will the computer answer to the player’s swear word before responding to a reference to a computer? In choosing what the computer will respond to and what the relative importance is of those items, the programmer is, in effect, establishing a personality or, if you will, identity for this ELIZA (as opposed to some other programmer’s ELIZA). PARRY obviously has an “identity” or “subjectivity” different from ELIZA’s.

As the player types in responses that meet or do not meet ELIZA’s various tests, the computer can respond in many different ways. It might rebuke for a swear word, and it would have a repertoire of half a dozen rebukes. Similarly, it might have a half-dozen phrases into which it could insert, invert, and feed back a reference to the analyst or to a computer. It would convert “you” to “me” and “I” to “you” and so on. (That is how the computer blundered in the example above.) It would have a vocabulary of four or five pleasant acknowledgments of happy feelings and regretful expressions of sympathy for bad ones. And if none of the tests fitted, it could say, “Uh-huh. Tell me more” in half a dozen different versions of its noncommittal reply. In the same way, PARRY would single out references to “hospital” or “police” and respond to any use of “you” with paranoid fears, again demonstrating a different “subjectivity” from ELIZA’s.

ELIZA and PARRY are “understanding” only the broadest aspects of the patient’s input (affirmative, negative, you, or me) and answering in a completely “canned” vocabulary. Nevertheless, they often *feel* uncannily sensitive. Although their authors thought of them as experiments in

“cognitive science” or “artificial intelligence,” a literary theorist might equally regard them as interactive fictions.

Indeed, the Hornblower-like fiction we quoted at the outset descends directly from ELIZA. Program lines like 3020–50 look through what the reader has typed in (stored as the string variable I\$) for certain key words and phrases: yes, sure, of course, all right, natur(ally). These lines then assign values to certain variables (YF, NF, WF) indicating the general tenor of the answer: yes, no, or questioning. (For example, line 3050 says, if what the reader typed in, the variable I\$, includes “AYE”, then this is a “yes” answer.) As the program works its way down the story through lines like 5300–50, it displays responses for the computer according to whether the reader’s answer was yes, no, or noncommittal. For example, a “no” answer would take the story to line 5330 and print out on the screen the version Niesz got. The computer can also store the consequences of its interpretation of Niesz’s answer: somewhere in the program there can be a variable whose value says there is no boarding net in place. Similarly, in other symbols within its strings, like “1” (line 5300), the computer stores—and delivers—the name of the player. In short, Lafore’s compunovel uses precisely the techniques invented by Weizenbaum for his silicon psychiatrist.

ELIZA and PARRY come from the period 1966–67. They were followed by many, many programs simulating the human use of language and various other forms of artificial intelligence.¹⁴ These programs, however, required special languages and big computers that only a business or university could own. The next quantum leap for interactive fiction occurred in the mid-1970s with the invention and dissemination to a constantly growing public of the inexpensive, privately owned microcomputer system.

The first popular microcomputer system, the Altair 8800, was developed in 1975–76. Often, before the Altair, pre- or quasi-literary works were illegitimate, being essentially contraband goods written by computer programmers for their own amusement, wasting expensive computer time on big, “mainframe” computers that were supposed to be used for more serious matters. The appearance of the microcomputer in the mid-1970s legitimated these activities and provided a quickly growing market which accelerated the growth of interactive fiction.

Ultimately, the fiction that resulted from the use of microcomputers has become sufficiently different from traditional fiction so that one might well wonder whether it is fiction at all. Interactive fiction creates a radical perspective on several of the problems that occupy literary theorists today: textuality, for example, narrative time, or response.

Certainly the quality is problematic. Today’s interactive fiction imitates—haltingly—the detective stories of Arthur Conan Doyle and Edgar Allan Poe, the adventure novels of Robert Louis Stevenson, or C. S. Forester’s Horatio Hornblower novels.¹⁵ Others build on Bram Stoker’s *Dracula* or the innumerable variations pop writers have spun on it. There

is, however, as of 1984 no interactive fiction that measures up even to these originals.

Quality aside, interactive differs most obviously from traditional fiction in its medium. Traditional fiction is printed on paper. Its text exists between the covers and the spine of a physical book. The texts of interactive fiction, however, are displayed on a video screen or terminal. In a sense, such texts have no physical being. The program may be physically stored on a magnetic disk, but the story itself can be read only as it continually flows through a computer's various subsystems. Particularly if the fiction is circulated by means of a telephone network linking various microcomputer terminals, it may have no particular location, simply existing here or there as one or another reader calls up the program.

Because the fiction is inseparable from the system that enables someone to read it, one cannot, as it were, hold the whole novel in one's hand. One cannot put it in one's greatcoat pocket as the eighteenth-century reader did. One cannot look back at what went before. One cannot look ahead (cheat?) to see how the story comes out. Indeed one cannot know how it comes out until the reader has supplied her share of the action.

Thus, in a literal sense, there is *no* text, nothing that could be put on a shelf and pointed to as the source of roughly similar experiences by readers. This presents something of a problem for contemporary literary theory. It is customary, for example, for theorists of literary reception to assert that a text "limits" or "constrains" or "controls" the reader's responses to it. With interactive fiction, that claim fails in two ways. First, there is no subject for the sentence, none, anyway, that does not also include the reader. Second, the program often misunderstands the reader in quite erratic ways, leading to still more variation in the text produced. For example, the computer correctly understood Niesz's response to the sailing master's question as a negative, but it misunderstood Holland's "Ay, ay" because the program only recognizes "Aye" as a yes. It went on to take his sarcastic "What did you think?" for a straightforward question (see lines 3050 and 5340).

Narrative time as well as narrative text changes. One can read Prince Andrei's whole lifetime in a matter of hours, because a traditional text usually creates a discrepancy between the time it takes to read the work and the narrated time of events within the story. In interactive fiction, however, the time it takes to read the work or bring it to a successful conclusion depends largely on the reader. A reader of an interactive mystery could take as long to solve it as Sherlock Holmes would in "real life"—twenty hours, one reader estimates.¹⁶

The structure of traditional fiction is essentially linear or serial. No matter how complex a given work may be, it presents information to its reader successively, one element at a time, in a sequence determined by its author. By contrast, interactive fiction is parallel in structure or, more accurately, dendritic or tree-shaped. Not one, but several possible courses

of action are open to the reader. Further, which one actually happens depends largely, though not exclusively, upon the reader's own choices. To be sure, the author is still in overall control, since it is she who has set up the particular nexus of events, but the route up the narrative tree, the actual sequence of events, is generally affected, if not completely determined, by the reader's responses to that particular reader's specific situation. In an adventure, the sequence of action frequently depends upon the reader's decision to go in one geographical direction rather than another. In the ELIZA sample, the content of the "story" depends on such particulars as whether this reader has a brother or not, whether she fears her father, and why she has consulted the terminal. In general, the text presented to the ELIZA-reader depends on what that reader has already said and how the computer has interpreted and stored it, and this is generally true of interactive fiction.

Further, interactive fiction is, in principle (if not in practice), open-ended—infinite. A conversation with ELIZA could go on for as long as one with Woody Allen's psychoanalyst—in principle, forever. It has no necessary terminus. The program will go on writing texts and answers on the screen as long as the reader or player chooses to supply responses. Further, the computer can act as a metafictional narrator like John Barth or Thomas Pynchon who can create a story within a story or a story that generates another story within itself which generates another story within itself and so on, fictions dizzying and dazzling. **One senses one's essential humanity wobbling in the midst of the infinite paradoxes of existence and meaning.**

One can also simply feel frustrated, as at an elusive puzzle. Most interactive fiction today does not adopt the metafictional form of the infinite, hall-of-mirrors story but rather the tactics of the detective, spy, or adventure novel—an extremely complex puzzle whose specific key the reader may have great difficulty finding but which is, in principle, solvable.

To get to the end of such a close-ended fiction, the interactive reader must work out which particular responses are appropriate and useful in a given situation and which responses are ineffectual, harmless, unwise, or, at the extreme, fatal to her persona. The high probability that a reader's alter ego will suffer failure or death, at least initially, calls upon the reader to restart her text frequently or to rethink her approach. The fundamental tactic is trial and error. As in any learning situation, the process can be both exciting and frustrating, because a successful conclusion depends upon previous frustration or failure.

Two elements which contribute toward making interactive fiction a challenge for readers are entrapment and the author's taunts. Nothing is quite as frustrating as knowing that you have just permitted yourself to fall into one of the author's traps and experiencing the unmistakable feeling that he is laughing at your expense. Feelings of frustration and

humiliation are therefore quite common in one's initial encounter with interactive fiction, and they become important motives in the reader's response, impelling her to continue until she has, as it were, turned the tables on the author by ferreting out all of the hidden secrets or conundrums of a given work.

This kind of finite, puzzle-solving interactive fiction demands determination and persistence from a reader if she is to overcome the obstacles which confront her. At the same time, however, this finite kind of interactive fiction is fundamentally optimistic. Its fictional universe is completely knowable. It is possible to discover not only where everything is but also its particular function in the scheme of things. This optimism regulates the reader's encounter with all of the unknown elements of the story. Even if the worst happens, and the reader-hero is killed, she can rest secure in the knowledge that there is life after death, and that she will eventually, if she persists, be able to fill in the gaps or discontinuities in her perceptions.

This type of interactive fiction is clearly biased in favor of the experimental method and the optimism traditionally associated with it. By contrast, the reader of a traditional fictional text is likely to feel that her own additions or substitutions fall short. That is, a reader, whether of Charles Dickens or Henry James, is likely to *feel* that the fictional world she has inferred from the novel is in some final sense mysterious and unknowable, beyond her grasp, beyond that of even the most willing author. By contrast, the reader of a finite interactive text is likely to *feel* that she can know and master this fictional universe. She is likely, in other words, to experience the optimism of the scientist at least as much as the mystery of art. The genre imitates action, rather than reflection, since if one makes a mistake and one's persona is killed, it is a simple matter to start over again. In a sense, the form intrinsic to the genre devalues the role of the individual persona and the need for reflection. As a corollary, once this kind of finite interactive fiction has been mastered, it generally ceases to hold the reader's interest, save for demonstrating prowess or ingenuity to the uninitiated. A finite interactive text is like pop fiction, read once and no more.

Because interactive fiction actively tests the reader's responses, it seems, at least at present, much less capable of portraying subjective realities, although one work, *The Prisoner*, based on the famous television series directed by Patrick McGoochan in 1967, makes a valiant attempt to do so.¹⁷ Since interactive fiction rests upon the premise of total reader involvement in the story, however, the fiction gets the reader to create actual subjective states directly instead of portraying subjectivity "out there" in the text. Hence, one logical development has been pornographic interactive fictions, games that ask for and directly address the player's sexual preferences.

In general, a finite, solvable interactive fiction lends itself to *doing* and to themes involving action, conflict, and adventure. Today's interactive fictions are mostly of that type. In principle, however, there seems no reason why an interactive fiction could not present subtler, subjective states mimetically and so greatly enlarge its scope beyond the action-oriented, finite adventure type, read only once. Similarly, an interactive fiction built on the miragelike, infinitely shimmering points of view of metafiction should be more like "high" fiction, something to which one can return again and again, expecting to find ever new experiences and new enjoyments.

Interactive fiction may appear to be completely divorced from reality—at least in the original "Adventure" pattern, located in the dungeon-and-dragon worlds of Conan or Tolkien. This also need not be the case. Some interactive fictions imitate current news events. One text dealt with the nuclear reactor crisis at Three Mile Island, while another, written during the time of the American hostage crisis in Iran, dealt with the attempted rescue of the hostages from the clutches of an evil High Tollah.¹⁸ In these forms, interactive fiction shows its ancestry in the gaming exercises long used among political scientists, military leaders, business theorists, and economists to simulate the effects of different possible approaches to real-world problems. In these versions, interactive fictions not only talk about the real world; they imitate the uncertain outcomes of history and politics—another kind of infinitely variable form. In these real-world fictions, like the real world itself, the reader must find her own way instead of merely being led along by the author's smoothly flowing text. (That, however, may be an inadequate metaphor for the traditional reader's activity.)

Recent theorists of reader response (such as Stanley Fish, Norman Holland, or Wolfgang Iser) contend that all literature is in its essence interactive. The reader does not merely passively accept or receive a given literary work but through the act of reading participates along with the author in the creation of the fictional world evoked by the heretofore lifeless text. Accordingly, one cannot truly say a work of literature exists until it is activated by the intervention of the reader, at which point the work may be said to exist through or within the dialectical process called reading.

At first glance, interactive fiction acts out this process literally. It seems to emancipate the reader from domination by the text by putting her in at least partial control of the sequence of events. A reader accustomed to the firm structure of a traditional novel will acquire that illusion of freedom, which Friedrich Schiller says is the foundation of art.¹⁹ Interactive fiction could be understood, in fact, as the realization of some of Bertolt Brecht's ideas about the critical, antagonistic relationship of reader to text. Writing in the heyday of radio, Brecht envisioned a system in which

the audience would not only have access to receivers but would in turn be able to make answering, critical transmissions.²⁰ Interactive fiction implements this feedback ideal. An interactive reader can, in effect, tell the text to go to hell—and it will.

Examined more closely, however, this emancipation is more apparent than real. The interactive fiction simply pushes the role of the text back a stage. While it may be up to the reader to decide whether or not to rig the boarding nets, the reader has to interpret the author's phrasing, "Shall I rig the boarding nets, Sir?" just as in reading a traditional text. The underlying nexus of puzzles or conundrums is the creation of the author, and to that rule the reader must submit—to the extent readers ever have to submit to a text.

Thus, the interactive fiction looks as though it acts out one particular model of reader response. Iser has suggested that the text of a novel lays down certain limits, but within those limits are gaps which a reader feels impelled to fill.²¹ An interactive fiction seems to make this arrangement explicit. In our example, the text leaves open whether or not boarding nets will be rigged. The reader decides. Then the author has decided how the sailing master, Stayson, will in turn answer the reader's various replies.

The dialogue about boarding nets doesn't fit Iser's model of reading, however. The interactive reader is not limited but (as in any text) free to respond in quite idiosyncratic or even bizarre ways. In our example, Captain Holland might have answered Stayson's question with "Good morning" or "XXyzzAAbbcc," and the novel would have stolidly continued, "Yes, Sir, Stayson replied, regarding his captain quizzically. Holland realized he should have given a more seamanlike response" (its "default" response for occasions when it doesn't "understand" what has been said, like the "Tell me more"s of ELIZA). Hence, Captain Holland would be quite justified in recognizing his own model of response: the text simply provides materials which the reader has unlimited freedom to shape, edit, and assemble into an experience that is congenial to his own identity. The text then gives its own good, bad, or neutral feedback to the response the reader has brought to bear.²²

Yet another feature of current literary theory that interactive fiction calls into question is the implied reader, as developed, say, by Hans Robert Jauss or Iser: the imperfectly understood reader the author has in mind.²³ The text of traditional fiction is, to make an analogy to Alvin Toffler's arguments in *The Third Wave*, an item intended for mass consumption, much the way shoes or blue jeans are produced for the masses of our industrial society.²⁴ One size, or a small range of sizes, fits all. Whether the reader is young or old, stupid or intelligent, the same text is intended to be read by both. According to a theorist like Jauss, such a text implies or evokes a reader to fit itself, even though the real reader

may differ in any number of particulars from the reader so implied. (After all, the ways in which the readers experience the text differ radically.)

Interactive fiction, on the other hand, is personalized or individually contoured for the specific reader through the computer's evaluation or integration of what the reader types in. The text configures itself, so to speak, according to the characteristics of the reader. A reader is implied, in Jauss' sense, but the implication includes the different choices the reader might make, much as some futurologists have imagined a contouring of mass production: the consumer of tomorrow will be able to communicate with the blue jeans factory to choose among various waist sizes, inseams, fabrics, and cuts and so instruct the factory's machines to cut an individually tailored pair.

So far as literary theory is concerned, however, this contouring by the computer does no more than introduce an extra stage. To say that another way, interactive fiction remains fiction for all its technological innovation. Both interactive and traditional fiction rely upon the use of written texts, or upon the elements of narration, plot, and dialogue. Whenever the main figure, the combined reader and hero, enters a new scene, a complete narrative description is given. The reader then responds to the text on the video screen by typing into the computer. This is a form of written dialogue, and all exchanges among the author, the author's text, and the reader's input-text are verbal. The familiar problems of readers' responses to verbal and fictional texts remain the same.

It is this reliance upon verbal utterances, upon language, upon texts in the broadest sense, which makes interactive fiction nevertheless a subspecies of literature, regardless of its mechanics of video screens, keyboards, and computer chips, regardless of the enigma it may be to literary theory. In this, as in other, more legitimate, less recent branches of literary endeavor, a text mediates between author and reader.

The authors of interactive fiction would agree. Writers—programmers—such as Scott Adams, Lafore, Berlyn, or Blank speak of writing compunovels or describe their works in terms of the literary tradition, a tradition, to be sure, of popular or "light" fiction.²⁵

Fiction these works may be, but the greatest fiction, in a way, is the genre itself. Writing about interactive fiction in 1984 is itself a fiction, rather like writing about the movies in 1900 or television in 1945—whatever one says, imagination cannot come near what the genre will eventually become. We have tried to suggest what interactive fiction is and how we might define it and understand it in relation to traditional fiction. How is it similar, how different? We have tried to sketch its history and its relation to other intellectual developments of the 1970s and 1980s. What of its future, however?

Today's interactive fiction builds on Sherlock Holmes stories and Horatio Hornblower novels, literary models from other genres and other

media, mostly popular fiction not ordinarily regarded by literary critics and scholars (*pace* Leslie Fiedler) as having much merit. These current texts or programs are not noteworthy for either originality or the skillful use of language. Since, however, all of these works are less than five years old, it is probably too early in the history of the genre to expect anything else at this time, although it would be reasonable to expect a greater proportion of truly original works in future years. We find it fascinating to imagine what some of our contemporary writers of meta-fiction—a John Barth or Italo Calvino or Ronald Sukenick or Raymond Federman—could do with this fantastic new resource, just as important for the art we all study as Johann Gutenberg. **So far, however, no major writers have attempted interactive fiction.**

We think it likely that within the next decade, interactive fiction, which as of 1984 can boast only a dozen texts that go beyond the adventure game, will become as popular a medium of entertainment as television is today. It could well become a competitor to other forms of light fiction, indeed, an improvement over the usual spy, detective, or romantic stories in being more open, less passive, more challenging to a reader's mind. Should major writers turn to writing "compufiction," we imagine it could become a major innovation, a genre for intense creative activity, like the early novels.

What the genre might look like in two decades, it seems impossible to say, given the rate of technological change. As we write, for example, the genre is advancing yet another technological step. Nationwide computer networks connected by telephone now maintain programs called "electronic novels." These admit totally free-form fictions: the original author simply starts out the story, and then anyone who wishes can add a chapter.²⁶ These are, then, multi-author fictions, written not by one or two or even a dozen authors but many, probably anonymous and probably casual and playful rather than authorially committed to writing a Novel with a capital *N*. In principle there is no limit to the number of possible authors, nor is there any reason in principle why such a novel need ever come to an end. The network makes it possible for the writing to go on and on and for the novel to exist in indefinitely many versions. **In effect, the reader-writers are acting out T. S. Eliot's dictum: the best response to a poem is another poem—although Eliot probably did not have this situation in mind. Here, the novel is, in effect, built up chapter by chapter by the readers' responses to the preceding chapters.**

A recent article describes literary magazines on the microcomputer networks. Authors pay to insert and store their creations. Then they receive royalties based on how often other subscribers access their work. Hence the process is self-correcting: only the vainest of vanity publishers will pay to keep a story available that no one is asking to see.

Such a microcomputer publication has resources the usual literary magazine lacks. In one issue of this electronic magazine, for example,

an author, instead of describing a Scarlatti pastoral, simply played it through the loudspeakers of his readers' computers. Other writers have words that flash, dance, flip themselves into reverse, or even speak themselves. One author quoted from Omar Khayyám's *Rubáiyát*,

The Moving Finger writes; and, having writ,
 Moves on: nor all your Piety nor Wit
 Shall lure it back to cancel half a Line,
 [st. 71]

at which point the writing reversed and erased half a line. Other author-readers compose in duets or improvise theater.²⁷ Indeed, the very article you now are holding in your hands was composed and revised by two people five hundred miles apart who have never met but transmitted their interactive versions of this text over telephone wires between their microcomputers.

This article could have remained in their machines, like interactive fiction, rather than being gelled into "hard copy." Had we left it there, we could have made it a continuing article that we (or you) could add to and change as the technology it describes changes—by means of that very technology. It would have become yet another example of what seems to be the central feature of interactive fiction or interactive writing in general: *writing and reading as processes replace writing and reading as products.*

This fluidity of medium and technology implies an essay, fiction, poem, or play almost unimaginably different from what readers have grown to know, expect, and love these past three centuries. Microcomputers will change our ideas and our practice of literature as much as Gutenberg did, deeply redefining the humanities in the process.

1. *Instant Software Catalogue* (Peterborough, N.H.: Instant Software, Inc., 1981), p. 29 [following the authors' request, publishers' names for software material are included for the convenience of interested readers—*Ed.*] It is worth noting that the advertisement appears under the heading "Adventure and Compunovels."

2. Robert Lafore, "His Majesty's Ship *Impetuous*," *Interactive Fiction* (Longwood, Fla.: Adventure International, 1980), a computer program.

3. Edward Rothstein (describing *Deadline*), "Participatory Novels," *New York Times Book Review*, 8 May 1983, p. 39; Lan Barnes (describing *Cyborg*), "Mike Berlyn: Programming His Way to a Pulitzer," *Softalk* 2 (June 1982): 164–68; see also p. 8.

4. William Patch from the department of history at Yale University informed us that he saw an earlier version of such an exhibit, by IBM in New York in 1964.

5. Lawrence Klein won the Nobel Prize in Economics in 1980 for this work.

6. See "Star Trek" and "Civil War," in David Ahl, *Basic Computer Games: Microcomputer Edition* (Morristown, N.J.: Creative Computing Press, 1978), pp. 162–69 and 46–50.

7. Bob Liddil gives a brief history of adventure games on microcomputers with techniques and comments on the various authors' styles. See his "On the Road to Adventure," *Byte* 5 (Dec. 1980): 158–70. Scott Adams, generally credited with being the first to transfer mainframe

adventure games to home computers, describes his fascination with the genre as combining his love of science fiction with his being “hooked” on the classic “Adventure” game of Willie Crowther and Don Woods (“Pirate’s Adventure,” *Byte* 5 [Dec. 1980]: 192, 212).

8. See K. E. Wagner, ed., *J. R. R. Tolkien’s Lord of the Ring Trilogy*, 2d ed. (Boston, 1967), and Robert E. Howard, *Conan: The Hour of the Dragon* (New York, 1977).

9. *Eighty Micro* 27 (Mar. 1982): 59, advertisement for Med Systems Software, describing the program ASYLUM. In *Eighty Micro* 30 (June-July 1982): 81, an advertisement claims for ASYLUM II “comprehension surpassing the legendary ASYLUM I.”

10. See John Craig, “Structured BASIC—A Negative View by Dr. Kemeny, the Author of BASIC,” *Kilobaud* 1 (Jan. 1977): 122–23.

11. For a simplified version of ELIZA, with explanation, see David Ahl, *More Basic Computer Games* (Morristown, N.J.: Creative Computing Press, 1979), p. 56.

12. Thomas W. Parsons, “ELIZA—A Software Classic for Your Micro,” *Microcomputing* 6 (Apr. 1982): 38–40.

13. John Krutch, *Experiments in Artificial Intelligence for Small Computers* (Indianapolis: Howard W. Sams, 1981), p. 90, and see pp. 89–91.

14. For an account of the movement, see Pamela McCorduck, *Machines Who Think* (San Francisco, 1979).

15. See advertisement for Lafore’s *Interactive Fiction*, *Softside* 3 (Oct. 1980): 90. The advertisement gives a brief description of the genre and describes the author as a “writer, columnist, and programmer.”

16. See Rothstein, “Participatory Novels.”

17. See Mullich, *The Prisoner* (Agoura, Calif.: Edu-Ware, Box 2222, n.d.).

18. See Bruce Stephenson, review of the program “Three Mile Island” (Muse Software), *Kilobaud* 6 (Feb. 1982): 180–81, and the advertisement for “Rescue at Rigel,” *Kilobaud* 4 (Sept. 1980): 33.

19. See Friedrich Schiller, “Über die ästhetische Erziehung des Menschen in einer Reihe von Briefen,” *Gesammelte Werke*, ed. Gerhard Fricke et al., 20 vols. (Munich, 1965–69), 19:5–95.

20. See Bertolt Brecht, “The Radio as an Apparatus of Communication,” *Brecht on Theatre: The Development of an Aesthetic*, ed. and trans. John Willett (New York, 1964), pp. 51–53.

21. See Wolfgang Iser, *The Act of Reading: A Theory of Aesthetic Response* (Baltimore, 1978), or “The Reading Process: A Phenomenological Process,” in *Reader-Response Criticism: From Formalism to Post-Structuralism*, ed. Jane P. Tompkins (Baltimore, 1980), pp. 50–69.

22. See Norman N. Holland, *Five Readers Reading* (New Haven, Conn., 1975), esp. pp. 209–31, and *Laughing: A Psychology of Humor* (Ithaca, N.Y., 1982), pp. 176–78 and 188–98.

23. See Robert C. Holub, “Trends in Literary Theory: The American Reception of Reception Theory,” *German Quarterly* 55 (Jan. 1982): 80–96.

24. See Alvin Toffler, *The Third Wave* (New York, 1980). In dividing history into the agricultural revolution, the industrial revolution, and the information revolution, Toffler deals with phenomena like interactive fiction in many other areas.

25. See Adams, “Say Yoho: A Monthly Column on Compunovels,” *Softside* 3 (Oct. 1980): 30.

26. As of 28 November 1982, the Literary SIG (Special Interest Group) of the nationwide CompuServe network had embarked on a collectively authored “novel” (the “Fun Book”) by more than twenty-eight people widely scattered across North America. The “sysops” (System Operators) had established a “problem” for the novel (a triple-sexed alien), certain ground rules (one author could not kill another author’s character), a sequence for the contributors, and the opening chapter. The text of the novel was available among the SIG’s electronically stored manuscripts (its “database”), while the “authors” were able to discuss in system messages to one another problems like the sexualities of the alien, the ground

rules, or the royalty arrangements. The novel, however, appeared to be a fairly conventional science fiction performance, the authors having rejected in their preliminary correspondence "New Wave" science fiction and its postmodern, metafictional possibilities.

27. See John P. Mello, Jr., "Networking Poet Laureate," *Eighty Micro* 35 (Dec. 1982): 404–8. Mello briefly appeared in the preliminary correspondence to the CompuServe "Fun Book" to offer suggestions and criticism.