

GAMES WITH A REAL

The latest electronic entertainments forgo animation for mind-bending do-it-

BY GARY TAUBES

Somehow near Los Angeles. A cold Friday evening in February . . . The taxi has just dropped you off at the entrance to the Linders' driveway. The driver didn't seem to like venturing into this maze of twisty streets any more than you did. But the house windows are full of light, and radio music drifts toward you. Your favorite pistol, a snub-nosed Colt .32, is snug in its holster. You just picked up a match book off the curb. It might come in handy. Good thing you looked up the police file on Mrs. Linder's death. Her suicide note and the newspaper story told you all you know about the family.



What next, shamus? What happens next is up to you: case the joint, fingerprint the murder weapon, arrest the butler. Or maybe just pull the disc out of the disc drive and relax. This is not real life—although sometimes it may feel like it. This is Witness, one of ten best-selling computer games from Infocom, a software firm in Cambridge, Massachusetts, that uses techniques developed in the nearby computer science laboratory of MIT to give a new twist to computer games. The concept is known as interactive fiction: no animation on the screen, no laser beams, no invading aliens—just prose like those Chandleresque sentences that begin Witness. In these computer-choreographed murder mysteries, fantasy adventures, and science fiction thrillers, the player controls the action and makes all the decisions until the mystery is solved, the adventure fulfilled, or the player simply exhausted.



The interactive games, which sell for \$40 to \$60 each, exercise the player's imagination and ingenuity rather than his fingers. They offer more than a rudimentary, programmed plot structure and a few simple choices. The Infocom games give the player hundreds of choices on any move: a few may affect the ending irreparably, some may be just a small step toward the denouement, and many simply go nowhere. The ingenious puzzles that the player confronts in pursuit of the solution have not only made the fiction adventures the best selling computer game in America, but last year prompted *Parents Choice*, a bi-monthly guide to entertainment and edu-

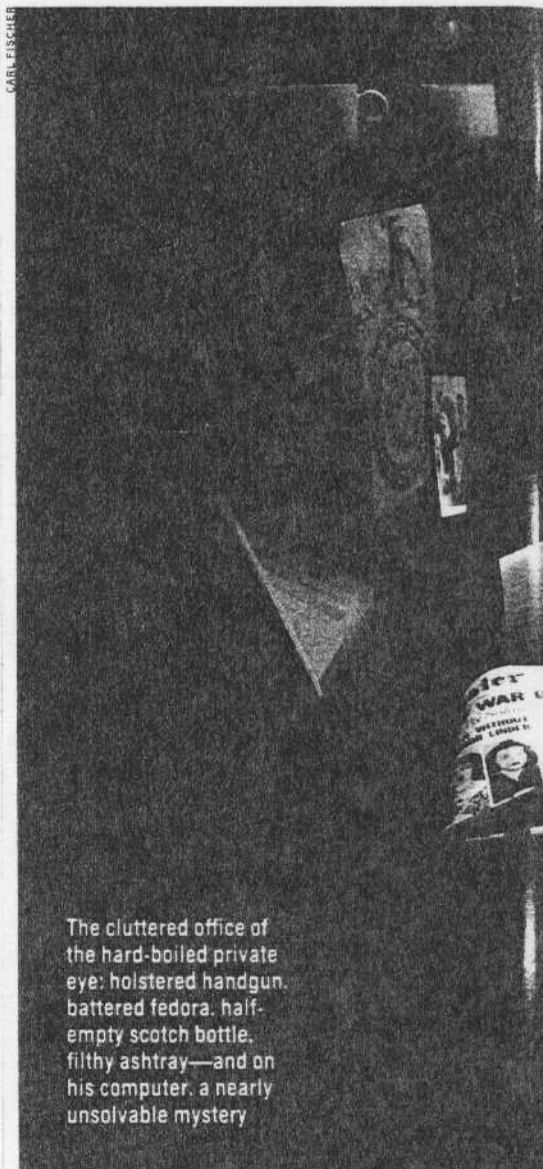
cational materials for children, to commend Infocom for its products.

Witness, the seventh of the Infocom games, is a murder mystery in the classic hard-boiled detective tradition. After a taxi deposits the player-detective in front of the victim's house, the player takes control. By typing commands on the keyboard in English sentences (For example, *Ring the doorbell and wait for the butler*), he propels the detective from room to room, clue to clue, suspect to suspect. The program responds with dialogue, consequences, and descriptions of places, objects, and characters. (Then the door swings open. "Good evening," says a smiling face. "I am Phong.")



As the detective probes deeper into the murky chain of events, the plot twists and turns again; suspects tamper with evidence or change their stories as they are confronted with their duplicity. As in real life, carelessness results in the loss of valuable information, or even elimination of the player. (Suddenly there is a flash of light and an explosion, and mortal pain radiates from your heart.)

The end comes either after twelve hours of fictional time—the minutes tick off with each command—or when the player decides to make an arrest. Only then does the computer reveal whether the detective uncovered enough evidence even to indict, let alone convict, the suspect. The game has many endings, but only one ultimate solution in which murderer, motive, and method are all revealed. Unlike real life, the game can be played again and



The cluttered office of the hard-boiled private eye: holstered handgun, battered fedora, half-empty scotch bottle, filthy ashtray—and on his computer, a nearly unsolvable mystery

again until it is finally solved, which can take—and usually does—30 hours or more.

The Infocom games are not the first of their genre. In 1976, two MIT graduates created *Adventure*, a programmed fantasy game of goblins, trolls, and magic that could be played only on main-frame computers—immense machines with tens of thousands of times more computing power than personal computers. (*Adventure* was later condensed to run on microcomputers and is still available.) That first *Adventure*

BYTE TO THEM

yourself whodunits and other fictional adventures



was a primitive game in which the player communicated with the machine using only two-word, verb-noun commands: *Kill troll, say, or Take sword.*

When a group of MIT researchers—all working for computer scientist Al Veza, now chief executive officer of Infocom—first played *Adventure*, they were enchanted. But with the tools at their disposal, they knew they could write their own, more ingenious version. One of those tools was developed by Veza's team



now vice president of Infocom, and Tim Anderson, now a consultant for the company, used MDL to program *Zork*, a fantasy adventure set in an underground world, which took more than a hundred hours to play and more than a million bytes of storage space on the MIT com-

puter. When Infocom was formed out of the nucleus of the MIT researchers, *Zork* became the first product.

Unlike *Adventure*, *Zork* attempted to mimic reality by allowing the player to communicate with the computer in complex English sentences. Blank invented a



computer parser for *Zork* that deciphers entire sentences rather than just two-word commands. It recognizes verbs, nouns, adjectives, adverbs, and prepositions. ➔



WINTER OLYMPICS
SPECIAL OFFER

**SUPPORT THE
U.S. OLYMPIC
BOBSLED TEAM
AND GET THIS
LIMITED EDITION
FULL-COLOR PRINT**

(actual size 17" x 22")



UNITED STATES BOBSLED TEAM SARAJEVO 1984

© 1983 Lederle Laboratories
A Division of American Cyanamid Company

Donate \$10* to the U.S. Olympic Bobsled Team and Lederle Laboratories will send you this exclusive four-color print. Simply complete the form below and return it along with a check, or money order made payable to "U.S. BOBSLED TEAM CONTRIBUTION."

Mail form and \$10 donation to:

Lederle Promotion Center
Bradley Industrial Park
2200 Bradley Hill Road
Blauvelt, NY 10913

Name _____

Address _____

City _____

State _____

Zip _____

*ALL CONTRIBUTIONS ARE TAX DEDUCTIBLE.
Cancelled check will be your receipt.

Offer good only in USA except where prohibited by law
Allow 6 to 8 weeks for delivery. Offer expires June 30,
1984.

RICHARD HOWARD



The wizards behind the computer magic of Infocom: Marc Blank, Joel Berez, and Al Veza. Behind them, the massive mainframe on which the games are created

When a player types in a command, the parser first compares the words in the command with those stored in its vocabulary of more than six hundred words. If one of the words is unknown to the computer, it says so, and the player tries again. If the parser knows each word, it analyzes the sentence structure, quickly categorizing and storing the parts of speech. A sentence with an unfamiliar structure will prompt the computer to suggest how it should be rephrased. Once the command is clear, the program executes it. Thus, if the player types *Pick up the jeweled sword and kill the troll with it*, the computer would understand and respond.

While the player is moving through the game, controlling the action, the program keeps the plot advancing behind his back. The characters and even the setting have their own parts to play, which bear directly on the final outcome. For instance, in *Witness* a suspect returns to the scene of the crime in the early morning hours to remove damning evidence. If the detective is present, the suitably embarrassed suspect departs, only to return later to fulfill the mission. If the detective is elsewhere, the suspect's tampering may go forever undetected.

The player's freedom of choice, combined with the computer-controlled actions, makes for an astronomical number of variations in each game. Says Michael Dornbrook, Infocom's product manager, "It's near infinity, but that doesn't mean the pro-

gram has to be that long." The programs are manageable because the games rely on another technique culled from artificial intelligence research.

Rather than one immensely long program that controls the way every person and object in the game will interact, each of the verbs, objects, and locations in the game has a computer code that describes its traits and the rules that govern its use. "It's not as if there's a program that says if the player types this, do this," says Blank. "There are just all these rules that start interacting. You can use any verb with any object even if that connection wasn't foreseen, because the verb routines have a built-in understanding of which things are reasonable and which are not."

The program knows, for instance, what the verb "burn" means, and it knows the characteristics of wood (although those characteristics may change from game to game or planet to planet). If a player types in *Burn the wood with the match*, the program pulls the codes for burn, wood, and match, examines the characteristics of all, and, if the match is lit, the wood is ignited. If some miscreant player types in, for instance, *Burn the wood with the stapler*, the program can provide a suitably flippant response: *With a stapler? ? ?*

The Infocom writers seem to have anticipated even the most bizarre commands of the players. In *Witness*, for example, the command to kiss one of the characters elicits the reply *Section 204D, paragraph 7.6, of the California police code of conduct*

specifically prohibits kissing potential suspects or witnesses. To assure that all eventualities are foreseen and all actions logical and uncontrived, testers at Infocom rigorously play the games before they are distributed. "Sometimes they'll find a few bugs," explains Dornbrook. "Those will be corrected, but then the testers still have to go back and play the game again and again and again." Even so, a team of outside testers—who get free games as payment for their time—also run the games through their paces. And after distribution Infocom is eager to hear customer suggestions and continually revises the games accordingly.

The complexity and seeming wizardry of the games is possible only because of the power of the computer language they are written in. When Infocom was formed, Blank and company president Joel Berez invented ZIL (for Zork Interactive Language), then transferred the original Zork from MDL into the new language, which was specifically tuned to the task of writing games. Creating a game in ZIL thus resembles writing as much as programming. Says Blank, "The language is as close to English as it can be."

Although the language is easy for the writers, it would overwhelm any home computer. Hence, Infocom uses a powerful mainframe computer to create its programs and to write games. Then the games are condensed from more than a million bytes of storage space down to 100,000 to fit on a home computer disc. This process turns all the high level concepts into nothing but numbers. So that this string of numbers can be understood by a home computer, a special code is tagged onto the programs to do the interpreting for each brand of home machine.

As literature, the games are fairly primitive, but Infocom is planning some improvements. First, the company hopes to entice well known whodunit and science fiction authors to write games for them. To make the games more realistic, they are working on a second generation parser that will understand even more complicated statements and questions. Ultimately, Infocom dreams of programs that are so lifelike, says Dornbrook, that the company can market them as "the last games you'll ever play."

If Infocom achieves that goal, an impatient player might want to take on the game with the attitude of the ultimate hard-boiled detective firmly in mind. "I never met a computer," the shamus would say, "that didn't understand a slap in the disc drive, or a slug from a forty-five." □

The price of looking it up just went *way down!*

Pub Price
\$69.95

Reg. B&N Price
\$19.95

Special
This ad only
\$14.95

Now you can own the latest edition of one of the finest dictionaries in print, and at the same time save up to \$55—\$19.95 if purchased from a Barnes & Noble bookstore and \$14.95 if purchased from this ad.

It's just our way of acquainting you with our "bend-over backwards" policy of giving you the most for your money.

Webster's—
Standard Reference for
More than 40 Years

Webster's Unabridged Dictionary has been a standard reference work for more than 40 years. The Webster's New Universal Unabridged Dictionary continues that fine tradition and is one of the most complete and up-to-date dictionaries available today. Just look at what it contains:

- clear and accurate definitions for 320,000 words and phrases;
- more than 3,000 illustrations;
- a complete collection of full-color maps of the world;
- thumb-indexed for easy reference.

In addition, the entries are printed in large, clear type, making this dictionary especially easy for you to read.

Includes 19 Important Encyclopedia Supplements

These useful supplements offer a wide range of valuable encyclopedic information, including...

- A Dictionary of Geography
- A Dictionary of Foreign Words
- A Dictionary of Scripture Proper Names
- Most Commonly Used Abbreviations
- Practical Business Mathematics;
- Commercial and Financial Terms
- Forms of Address
- Tables of Weights and Measures
- Presidents, Vice Presidents and Cabinet Officers of the United States
- Air Distances between Principal Cities
- Principal Geographical Features of the World



2,300 pages • 320,000 words • 3,000 illustrations
• Full-color maps of the world!

NOW SAVE \$55

You might expect a dictionary that's this complete to cost you as much as \$50, \$60, or even \$70. Indeed, the original publisher's price of Webster's New Universal Unabridged Dictionary is \$69.95. But now, by special arrangement with the Publisher, we can offer this fine reference work for the amazingly low price of only \$14.95. That's a saving of \$55.00 or 79% off the original price, and an even greater savings off our regular bookstore price—25% greater! This special \$14.95 price is only good by mail with order form below.

Barnes & Noble

BOOKSTORES, INC.

126 Fifth Ave., Dept. W100, N.Y., N.Y. 10011

1189368. Please rush me _____ copies of the Webster's New Universal Unabridged Dictionary at your special sale price of \$14.95 (plus \$3.00 shipping & insurance.) N.Y. and N.J. residents: Please add sales tax.

Your 30 Day Money-Back Guarantee

Examine this unabridged dictionary for up to 30 days. If you are not absolutely convinced that it is the finest dictionary you ever used, return it for a full and prompt refund.

Offer good only in the continental U.S.A.

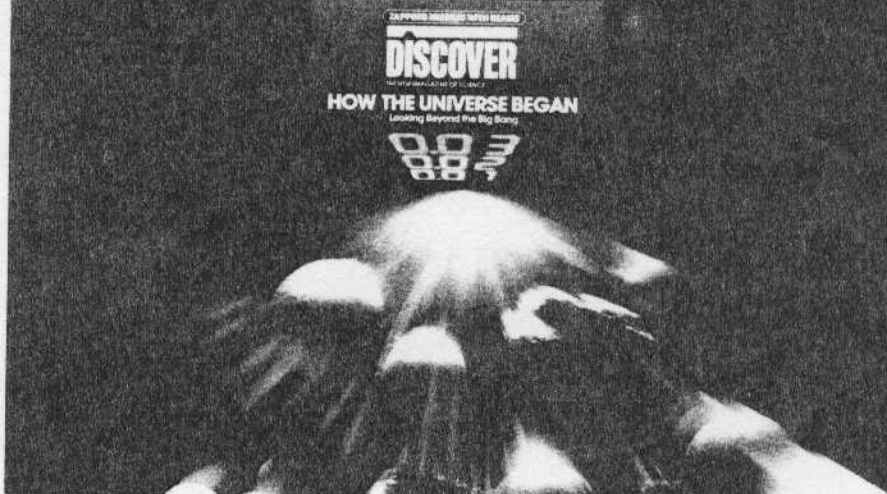
- Check One
 Payment enclosed
 I prefer to charge this purchase to:



name _____
 address _____
 city _____
 state _____ ZIP _____

Account# _____ Exp. _____
 Signature _____ 1983 Barnes & Noble Bookstores, Inc.

EXPAND YOUR MIND EXPLORE DISCOVER



Voyage into outer space. • Journey to the future. • Investigate the latest in technology. • Witness medical breakthroughs. • Probe the inner workings of the brain. • Uncover the body's deepest secrets.

• Venture back to the beginning of time. . . Every month DISCOVER Magazine takes you to the heart of science, with timely, thought-provoking articles and vivid, revealing photography. Join us.

Subscribe to DISCOVER today.

The Newsmagazine of Science

CALL TOLL-FREE: 1-800-621-4800 or WRITE: DISCOVER, 541 North Fairbanks Court, Chicago, Illinois 60611. 12 issues for just \$21.95. Rates good in U.S. only.