Chapter VIII: The Craft of Adventure

Designing is a craft as much as an art. Standards of workmanship, of ''finish'', are valued and appreciated by players, and the craft of the adventure game has developed as it has been handed down. The embryonic 'Zork' (Tim Anderson, Marc Blank, Bruce Daniels, Dave Lebling, 1977) – shambolic, improvised, frequently unfair – was thrown together in a fortnight of spare time. 'Trinity' (Brian Moriarty, 1986), plotted in synopsis in 1984, required thirteen months to design and test.

'Spellbreaker' (Dave Lebling, 1985) is a case in point. A first-rate game, it advanced the state of the art by allowing the player to name items. It brought a trilogy to a satisfying conclusion, while standing on its own merits. A dense game, with more content per location than ever before, it had a structure which succeeded both in being inexplicable at first yet inevitable later. With sly references to string theory and to Aristophanes' *The Frogs*, it was cleverer than it looked. But it was also difficult and, at first, bewildering, with the rewards some way off. What kept players at it were the ''cyclopean blocks of stone'', the ''voice of honey and ashes'', the characters who would unexpectedly say things like ''You insult me, you insult even my dog!''. Polished, spare text is almost always more effective than a discursive ramble, and many of the room descriptions in 'Spellbreaker' are nicely judged:

> *Packed Earth*
> This is a small room crudely constructed of packed earth, mud, and sod. Crudely framed openings of wood tied with leather thongs lead off in each of the four cardinal directions, and a muddy hole leads down.

In short, it was masterly craftsmanship (in what was Lebling's seventh title) which made this exercise in pushing the boundaries of difficulty and connectedness possible.

Classics like 'Spellbreaker' cast long shadows and have endured beyond all expectation: 'Zork II', for instance, has been continuously on sale in the high street since 1981, a record matched by only about two dozen of that year's novels. But the story of interactive fiction is *not* the story of the production company Infocom, Inc., alone. Many hundreds of plays were performed in late sixteenth-century London, but today only Shakespeare's three dozen are familiar, even the weakest protected from neglect by the gilding of being canonical. The resulting attention may be justified on literary grounds, but perhaps not historical, since it gives a picture wholly unlike the regular diet

of the contemporary audience. So with Infocom. Many 1980s adventure players seldom if ever played their works, or not until years later. Their real importance, besides quality and familiarity, is that they were foundational, in the same way that Hergé's pre-war *Tintin* albums evolved the visual grammar of the European graphic novel, from layout rules for speech bubbles and panels to how sudden motion should be depicted. Tintin and his dog Snowy began to walk from left to right (the direction of reading) when making progress, but from right to left after a setback. Snowy lost first the ability to speak, then the ability to understand Tintin's speech. Infocom had a similar effect in laying down the mechanics of interactive fiction, the conventions of which are subliminally accepted by players (and silently perpetuated by Inform). For instance, it was the Infocom games of 1986 which began the now familiar use of pop-up literary quotations as a stylish form of commentary or signposting, a development which might be compared to exclamation marks appearing over the heads of surprised characters in *Tintin*.

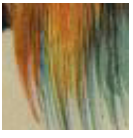
The mechanics of reading a novel are almost unconscious, but the mechanics of interactive fiction are far less familiar, and it is a uniquely unforgiving medium. A technical mistake by a novelist, say an alternating dialogue so long that it becomes unclear who is speaking, does not make it impossible for the reader to continue, as if the last hundred pages of the book had been glued together. The designer of an interactive fiction has continually to worry over the order in which things happen, the level of difficulty, the rate at which new material is fed out and so on. Meanwhile, even the designer's footing seems uncertain, for the form itself is a wavering compromise. An interactive fiction is not a child's puzzle-book, with a maze on one page and a rebus on the next, but nor is it a novel. Neither pure interaction nor pure fiction, it lies in a strange and still largely unexplored land in between.

• REFERENCES

In this chapter, a game is cited by designer and date when first mentioned but subsequently by title alone. Details of availability may be found in the bibliography of cited works. •Unattributed quotations from Infocom designers are all to be found in the `ftp.gmd.de` archive of 1980s computing press articles. My choice has been skewed by availability: Lebling is quoted frequently not because he was a great designer (though he was) but because he often went on the record. Marc Blank, among other notable figures, spent less time entertaining the press. •Some thousands of internal Infocom email messages (1982–) have been quietly preserved. Except at the end the overall impression is of a sensible workplace with engagingly warm moments, and a number of unsung figures emerge from the shadows. Much of this material is unlikely to become public because of its personal nature. To respect this, I have quoted nothing directly from *unpublished* email and have avoided attributing specific

opinions to named people. I do quote from the handful of relatively innocuous emails published on Activision's *Masterpieces of Infocom* compact disc, though note that these were stripped of all context. For instance the most interesting, a 1987 memo about which way to take text games now (discussed briefly in §49 below), is not as it seems a minute of a committee but was typed up as an apology to two people offended at being excluded from a low-key crisis meeting, held covertly off the premises. •A happier example is a sketch written by Stu Galley in response to an email circular asking for a job description: the so-called 'Implementors' Creed'. Despite the style – fifty percent mission statement, fifty percent Martin Luther King – this manifesto is worth reading, because it is conscious of working in an experimental and artistic medium: "I am exploring a new medium for telling stories. My readers should become immersed in the story and forget where they are. They should forget about the keyboard and the screen, forget everything but the experience. My goal is to make the computer invisible. ... None of my goals is easy. But all are worth hard work. Let no one doubt my dedication to my art." •Another true believer was Cleveland M. Blakemore, in his treatise in issue 54 of *Ahoy!* magazine: "Every human being on earth is a natural dynamo of creative energy. Learning how to tap this energy and translate it to a book, a canvas, or a computer's memory, is a skill that can be learned."

§46 A short history of interactive fiction



The history of interactive fiction in the twentieth century has yet to be written. One outline might be as follows: an age of precursors and university games, 1972–81; the commercial boom, 1982–6; a period of nostalgia among Internet users for text while the industry completed the move to graphical games, 1987–91; and the age of the Usenet newsgroup `rec.arts.int-fiction` and its annual competition, of shorter stories moving away from genres and puzzles, 1992–9.

§46.1 Precursors and university games 1972–81

Perhaps the first adventurer was a mulatto slave named Stephen Bishop, born about 1820: ''slight, graceful, and very handsome''; a ''quick, daring, enthusiastic'' guide to the Mammoth Cave in the Kentucky karst. The story of the Cave is a curious microcosm of American history. Its discovery is a matter of legend dating back to the 1790s; it is said that a hunter, John Houchin, pursued a wounded bear to a large pit near the Green River and stumbled upon the entrance. The entrance was thick with bats and by the War of 1812 was intensively mined for guano, dissolved into nitrate vats to make saltpetre for gunpowder. After the war prices fell, but the Cave became a minor side-show when a desiccated Indian mummy was found nearby, sitting upright in a stone coffin, surrounded by talismans. In 1815, Fawn Hoof, as she was nicknamed after one of the charms, was taken away by a circus, drawing crowds across America (a tour rather reminiscent of Don McLean's song ''The Legend of Andrew McCrew''). She ended up in the Smithsonian but by the 1820s the Cave was being called one of the wonders of the world, largely due to her posthumous efforts.

By the early nineteenth century European caves were big tourist attractions, but hardly anyone visited the Mammoth, ''wonder of the world'' or not. Nor was it then especially large, as the name was a leftover from the miners, who boasted of mammoth yields of guano. In 1838, Stephen Bishop's owner bought up the Cave. Stephen, as (being a slave) he was invariably called, was by any standards a remarkable man: self-educated in Latin and Greek, he became famous as the ''chief ruler'' of his underground realm. He explored and named much of the layout in his spare time, doubling the known map in a year. The distinctive flavour of the Cave's names – half homespun American,

half classical – started with Stephen: the River Styx, the Snowball Room, Little Bat Avenue, the Giant Dome. Stephen found strange blind fish, snakes, silent crickets, the remains of cave bears (savage, playful creatures, five feet long and four high, which became extinct at the end of the last Ice Age), centuries-old Indian gypsum workings and ever more cave. His 1842 map, drafted entirely from memory, was still in use forty years later.

After a brief period of misguided philanthropy in which the caves were used as a sanatorium for tuberculosis patients, tourism took over. By the twentieth century nearby caves were being hotly seized and legal title endlessly challenged. The neighbouring chain, across Houchins Valley in the Flint Ridge, opened the Great Onyx Cave in 1912. By the 1920s, the Kentucky Cave Wars were in full swing. Rival owners diverted tourists with fake policemen, employed stooges to heckle each other's guided tours, burned down ticket huts, put out libellous and forged advertisements. Cave exploration became so dangerous and secretive that finally in 1941 the U.S. Government stepped in, made much of the area a National Park and effectively banned caving. The gold rush of tourists was, in any case, waning.

Convinced that the Mammoth and Flint Ridge caves were all linked in a huge chain, of perhaps four hundred miles in extent, explorers tried secret entrances for years, eventually winning official backing. Throughout the 1960s all connections from Flint Ridge – difficult and water-filled tunnels – ended frustratingly in chokes of boulders. A "reed-thin" physicist, Patricia Crowther, made the breakthrough in 1972 when she got through the Tight Spot and found a muddy passage: it was a hidden way into the Mammoth Cave.

Under the terms of his owner's will, Stephen Bishop was freed in 1856, at which time the cave boasted 226 avenues, 47 domes, 23 pits and 8 waterfalls. He died a year later, before he could buy his wife and son, and achieve his ambition of farming in Argentina. In the 1970s, Crowther's muddy passage was found on his map.

. . . . .

One of Pat Crowther's caving companions was her husband, Will, who had already used computer plotters to draw the group's maps. He takes up the story:

> I had been involved in a non-computer role-playing game called *Dungeons and Dragons* at the time [c. 1975], and also I had been actively exploring in caves ... Suddenly, I got involved in a divorce, and that left me a bit pulled apart in various ways. In particular I was missing my kids. Also the caving had stopped, because that had become awkward, so I decided I would fool around and write a program that was a re-creation in fantasy of my caving,

> and also would be a game for the kids ... My idea was that it would be a computer game that would not be intimidating to non-computer people, and that was one of the reasons why I made it so that the player directs the game with natural language input, instead of more standardized commands.

(Quoted in Dale Peterson, *Genesis II: Creation and Recreation with Computers*, 1983.) It's hard not to feel a certain sadness that the first adventure game is shaped by these two lost souls, Bishop and Crowther, each like Orpheus unable to draw his wife out of the underworld.

Crowther's program (c. 1975), then, was a simulation of the Bedquilt Cave area, owing its turn-based conversational style to a medieval-fantasy adaptation of tabletop wargaming: E. Gary Gygax and Dave Arneson's *Dungeons and Dragons* (1973-4). Nor was the program without precedent, either in computing – 'Hunt the Wumpus' (Gregory Yob, 1972) was a textual maze game, while 'SHRDLU' (Terry Winograd, 1972) had a recognisably adventure-like parser – or in literature, where OuLiPo and other ludic literary genres, especially in France, had tried almost every permutation to make physical books more open-ended: Raymond Queneau's *Cent mille milliards de poèmes* (1962) cut its pages into strips so that the lines of ten sonnets could be mingled to form 10^{14} different outcomes.† But the OuLiPo writers, and earlier futurists, had thought more in terms of clockwork than the computer: the literature machine's unashamed mindlessness a provocation to the reader, in whom associations will be triggered. Italo Calvino (in his 1969 lecture *Cybernetics and Ghosts*):

> It will be the shock that occurs only if the writing machine is surrounded by the hidden ghosts of the individual and of his society.

To all intents and purposes, then, 'Advent' had invented a new category of computer program and of literature. The aim was to explore, with five treasures hidden below and only a few of the more ''natural'' puzzles as obstacles, such as the snake, the dwarves and pirate, the first of the mazes and the limited battery span of the caver's essential companion, the carbide lamp. Like the real Bedquilt, the simulation has a map on about four levels of depth and is rich in geological detail:

> 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.

† Queneau's novel *Zazie dans le métro* is freely adapted, and translated into Italian, by Luca Melchionna's Inform game 'Zazie – Una lettura interattiva' (1999).

There are photographs of this chamber and of the column that descends to it, which is of travertine, an orange mineral found in wet limestone. The game's language is loaded with references to caving, to "domes" and "crawls". A "slab room", for instance, is a very old cave whose roof has begun to break away into sharp flakes which litter the floor in a crazy heap.

Working at SAIL, the Stanford Artificial Intelligence Laboratory, in the spring of 1976, Don Woods discovered Crowther's game among a number available to be played across the burgeoning (110-computer) network ARPANET, the child of a shotgun wedding in 1969 between university and Department of Defense PDP-10 (and some other) computers. The PDP-10, whose character set did not include lower case letters – hence the capitals above, although elsewhere in the book quotations from 'Advent' have been normalised – was widely found to be a "friendly" computer for recreational use, but more to the point it was a time-sharing computer on which individual users could run programs much larger and more complex than traditional games like the PDP-1's *Spacewar!*. With Crowther's eventual blessing, but working entirely independently, Woods reworked the caves and stocked them with magical items and puzzles, liberally ignoring the original style from time to time. Much of the game's classic quality comes from the tension between the original simulation, the earnestly discovered caves with their mysterious etched markings and spectacular chambers, and the cartoonish additions – the troll bridge, the giant's house, the Oriental Room, the active volcano. Crowther contributed an austere, Tolkienesque feel, in which magic is scarce, and a well-judged geography, especially around the edges of the map: the outside forests and gullies, the early rubble-strewn caves, the Orange River Rock. Some of Woods's additions, such as the bear, were sympathetic but others, such as the vending machine for fresh lamp batteries, clashed against the original. But their strange collaboration is somehow consistent. 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*.

By 1977 tapes of 'Advent' were being circulated widely, by the Digital user group DECUS, amongst others, taking over lunchtimes and weekends wherever they went. The idea spread, and diffused, as it surprised members of the general public who were shown it by friends. In Tracy Kidder's Pulitzer prize-winning book *The Soul of a New Machine* (1981), a journalist's-eye-view of the building of a new model of company-sized computer, 'Advent' appears as an addiction, but more: while the engineers use the program as a convenient endurance-test, for Kidder it is a cypher for an absorbing inner world and, perhaps, an emerging personality. Another fascinated visitor, the television

producer Patrick Dowling, created *The Adventure Game* (BBC1 and BBC2, May 1980 to February 1986): by a curious coincidence, his first choice as puzzle-deviser and scriptwriter was Douglas Adams, then at the BBC but as it turned out unavailable. Adams will reappear later. In the *Game*, Earth-people were tested by the alien Argonds by being made to explore rooms stocked with items and quite difficult puzzles in hope of finding drognas (the currency of Arg), payment of which might placate His Highness the Rangdo, who had adopted the body of an aspidistra plant with a tendency to shake and roar when irritable. (And there may have been other anagrams of "dragon".) A recurring puzzle was a simple adventure game running on, naturally, a BBC Micro, so that each week viewers would see fresh contestants sit at the keyboard and twig, eventually, that the "scarlet fish" was a red herring.

Most of the university departments then connected to the ARPANET specialised in computer science, where any program is an invitation to develop a further one. At Essex University, England, Roy Trubshaw and Richard Bartle developed the concept of 'Advent' into 'Essex MUD' (which ran from late 1979 to September 1987 and continues in different forms even today). MUD was a Multi-User Dungeon to which remote users logged on during the night, competing sometimes unkindly with each other – killing another player netted 1/24th of their points, which must otherwise be earned by the troublesome business of finding treasures and dropping them into a swamp – to become "wizards" in a fantasy landscape anglicised slightly by the presence of a thatched cottage. To early phone-line networks such as British Telecom's Prestel Gold and CompuServe, running MUDs was (briefly) lucrative, and in a sense the Internet-connected "deathmatch" tournaments of today's games like 'Quake' are the legacy of MUDs.

In 1979–81, "game assemblers" were written in at least three departments to make new "Adventure-like programs" – the plural "adventures" seems not yet to have been used. Chris Gray and Alan Covington's "Six/Fant" at the University of Alberta, Canada, and the UCLA Computer Club's "Dungeon Definition Language" (which later evolved into Tim Brengle and Ross Cunniff's ADL (1987)) deserve mention. At Cambridge University, England, however, the assembler by David Seal and Jonathan Thackray may have been the first "adventure design system" to be used more widely than by its creators. Here is some typical code, allowing the player to jump up to a hole only if carrying the chair and in the room which actually has the hole:

```
JUMPHOLE:
 SKIP UNLESS R (CHAIR)R EQ HOLEROOM
 SKIP UNLESS H CHAIR PLAYER
 PRINTRET HOLEHIGH
```

```
MOVE PLAYER WITH TO UPROOM
PRINTRET CHAIRJUMP
```

The assembler was used to build sixteen games which were the chief recreation on ''Phoenix'', the IBM 370 mainframe used by undergraduates and academic staff throughout the 1980s. These were large, computationally expensive games, traditional in form and very difficult, played outside of prime time when research palled. ''Well go and do some work then'' is the parting shot of 'Fyleet' (Jonathan Partington, 1985). Titles tended to be distinctive one-word commands, supposedly the names of ancient lands. Some games were later released by Acornsoft and some later again by Topologika, so that these are sometimes vaguely called ''the Topologika games''. But to anyone who was there, they are as redolent of late nights in the User Area as the soapy taste of Nestlé's vending machine chocolate or floppy, rapidly-yellowing line printer paper. Adam Atkinson (author of 'Nidus', 1987), who still has faint sketch-maps drawn on that paper more than ten years ago, has recently worked with Paul David Doherty and Gunther Schmidl to recover much of the Phoenix source code; many of the games have now returned to play through mechanical translation to Inform.

'Advent' had no direct sequel as such, but for the five years to 1982 almost every game created was another 'Advent'. The standard prologue – middle game – end game form would have, for prologue, a tranquil outside world (almost always with a little building offering two out of three of a bunch of keys, a bottle and a lamp); the middle game would be a matter of collecting treasures from a cave and depositing them somewhere, while the end would be called a ''Master Game''. The secret canyons, cold spring streams, wizards' houses, passive dragons, bears, trolls on bridges, volcanos, mazes, silver bars, magic rings, lamps with limited battery power, octagonal caverns with exits in all directions and so forth recur endlessly in a potent, immediately recognisable blend. Publicity surrounding the notorious Ace Paperbacks pirate edition (1965) of *The Lord of the Rings* had helped make Tolkien's epic an American campus classic of the late 1960s: ten years later, most of the cave games can be seen to have superficial Tolkienisms, with elves, dwarves (note the spelling) and dungeons called Moria. Unsurprisingly, then, the first book adaptation in interactive fiction seems to have been 'Lord' (Olli J. Paavola, c. 1980), initially a mainframe game at Helsinki.† (The earliest ARPANET connections outside America were to Britain and Scandinavia.) 'Lord' took pains to be faithful to

† 'Journey to the Center of the Earth' (1978), by the remarkable Greg Hassett – then aged twelve – had better be disqualified, unless Jules Verne's original really has a coke machine, a troll's palace and a car repair shop.

the text, even to including the ballads.

> You are standing now in Longbottom where Tobold Hornblower once lived, the one who first grew the true pipe-weed in his gardens, about the year 1070 according to Shire reckoning. To the south-east is a narrow path.

It was characteristic of Tolkien, who died in 1973, to think the Hobbit tobacco industry as "real" as the story of the Ring, but it has been characteristic of Tolkien's imitators and adaptors to prefer orcs and magic: 'Lord', though never completed, has a true authenticity. Even here, though, the myth of the cave game – the underground labyrinth linking the computers – is as strong as the myth of Middle Earth. 'Lord' also has a Flathead coin and a postage stamp, in clear reference to 'Dungeon', the 1978 mainframe distribution of the game before and afterwards called 'Zork'.

At one extreme of the cave game is 'Adventureland' (Scott Adams, 1978), the first commercial game to reach the home: a tiny set-piece for cassette tape-based microcomputers, written under vicious memory constraints. "I'm in a temple" is as detailed as it gets, but Adams's games are distinguished by weirdly errant grammar, a wide vocabulary and a talent for arranging diverse objects in a room to portray it:

> I'm in a dismal swamp.
> Obvious exits: North, South, East, West, Up.
> I can also see: cypress tree – evil smelling mud – swamp gas – floating patch of oily slime – chiggers

At the other extreme is 'Acheton' (David Seal, Jonathan Thackray, Jonathan Partington, 1978–80), probably the largest game in the world in 1980, with 162 objects in 403 locations. (The title is a confection of Acheron, the underworld, and Achates, a character from the Aeneid.) Here is the lodestone room:

> You are in a large featureless room whose walls are composed entirely of a black magnetic material. Your compass seems incapable of fixing on any direction as being north. Several passages lead off to other parts of the cave.

This might easily be a room from 'Advent': and for all that they vastly differ in scale, 'Acheton' and 'Adventureland' are recognisably the same game.

△ As 'Advent' spread through universities, so it was often reworked and altered. As with Chaucer's *Canterbury Tales*, the vast number of mutated versions is evidence of popularity not just with the audience (players) but with those who told the tale (programmers). Chaucer's original manuscript is lost but all 83 surviving variants are thought to derive from a single version copied from it. Here, it is Crowther's 5-treasure original (c. 1975) which is gone, and all known forms of 'Advent' build on Woods's 15-treasure extension of June 1977, further diluting Crowther's contribution, that is, the simulation aspect of play. (For a "filiation" almost as complicated as Chaucer's, that is, a family tree showing how the many versions relate to each other, see `ftp.gmd.de`.)

Most of these extensions are inferior works, making nervous and minor additions, but three deserve passing mention. Don Woods made a further extension in Autumn 1978 to a "20-treasure version (Revision 2)", which he still considers definitive: it made the modest addition of a reservoir and cliff, scoring from 430 rather than 350 points. David Platt's 550-point version (1979) has a "Valley of the Stone Faces" and a puzzle bringing the volcano into play. Like Platt, David Long (1978) also felt the need to add a sword-in-the-stone puzzle: Long's 501-point version has some painful incongruities, such as a Wumpus and a telephone box, but is actually not too bad.

△ A port by Jay Jaeger for a (substantially souped-up) kit-built Altair 8800 is claimed to be the first microcomputer version: if so, it was not alone for long. Microsoft and Apple, unequal titans of the future but contenders even then, followed with 'Microsoft Adventure' (Gordon Letwin, 1979) and 'Apple Adventure' (Peter Schmuckal and Leonard Barshack, 1980) for Apple II and TRS-80. Early commercial versions were faithful or trimmed, although Microsoft added a "Software Den", north of the Soft Room, containing computers and a bearded programmer whose "spells help keep this cave together". (Cf. the RAM location in 'Adventureland', or the appearance in person of the programmers of 'Enchanter'.) Level 9's multi-platform 'Colossal Adventure' (1983) also has a classic feel but makes a confident extension, with a fleshed-out landscape above ground including a spire and a hawthorn wood, and a more satisfying end-game. The authors of the little-known but rather good Spectrum 128K version 'The Serf's Tale' (Nigel Brooks and Said Hassan, Players, 1986) seem familiar with Level 9's, and add a mild intrigue (in cut-scenes, the player searches a dead body for keys, and is helped by an innkeeper) on the way to the caves. 'The Serf's Tale' takes embellishment to baroque extremes: "You are in a splendid chamber shaped like the inside of an Arabian tower. The walls are frozen rivers of orange stone that curve gently up to a shadowy apex some thirty feet above your head. From this a huge stalactite hangs like an inverted spire above the centre of the room." One wonders if Crowther would still have known his place.

§46.2 The commercial boom 1982–6

"Then Adventure hit MIT and everything changed." The response of a disparate group of students, an improvised imitation called 'Zork', led to the founding of Infocom, in June 1979, which at its height six years later employed a hundred people: its mainframe, "a fleet of red refridgerators" (Brian Moriarty), had the electricity bill you would expect "if you were running an aluminum smelter" (Marc Blank). An engaging image, but extensive testing and packaging were also critical in establishing Infocom as a quality brand in a self-created niche market. Infocom's glory years have been romanticised by talk of its free soda, aloha shirts and the Tuesday lunchtime meetings of the

Implementors of games – of whom there were never more than ten, and who were by no means as free to do whatever they liked as their image suggested. Too little credit has been given to department heads who were at least as responsible for Infocom's artistic texture, notably John Prince (book editor, lunch host and low-key manager of the Implementors) and Liz Cyr-Jones (chief of testing, and the only woman to substantially influence the creative process). "The staff dresses casually, and it appears as if some of them have slept in their clothes, if they have slept at all. . .", wrote Richard Dyer in the *Boston Globe* (6 May 1984), the most perceptive and least wide-eyed of their many journalist visitors. There was pain on the way, particularly in the discovery that games were to be the only viable product of the former MIT Dynamic Modelling Group, and not merely an interim line. Unsavoury corporate dealings after a buyout by another ailing company, together with the Implementors' own faltering belief in text as the medium and the exhaustion of key members of staff, made the winding-down of 1988–9 unnecessarily dispiriting. But former hands mostly look back on the heyday as a happy, one-time thing, like a summer romance.

Infocom was dominant for a period in the higher-end, chiefly American market: in 1985 it always occupied several of the top twenty positions in the SoftSel Hot List – industry-wide sales charts run by a major US distributor – and one game held the number one slot for nine months. But the company was not nearly so visible outside the USA, where disc drives were less affordable, and in any case had no monopoly on the basic idea. "The 'adventure boom' is on – witness the rash of new programs, books and even a specialist magazine."‡ Although many were short-lived in what was something of a cottage industry, Hans Persson's catalogue cites 329 production companies. For instance, in the UK, Acornsoft made an early start: based in Cambridge and with close links to the university, it had a ready-made supply of adventure designs and quickly released reworkings of the Phoenix mainframe games for the BBC Micro – Acorn's computer, but built to spearhead a national computer literacy campaign supported by television programmes. Some of Acornsoft's titles

‡ Thus A. J. Bradbury, in *Adventure Games for the Commodore 64* (1984, with variant editions for other microcomputers), a wide-ranging and thoughtful book: for instance Bradbury discusses defects in 'Philosopher's Quest' (arbitrary) and 'The Hobbit' (too little thought to different possible orders of play – perhaps this is why many winning lines score more than 100%), advocates mapping on a linked-octagon grid and so on. The magazine alluded to is *Micro Adventurer*, edited by Graham Cunningham and published by the small press Sunshine Books. It ran for thirteen issues from November 1983, moving gradually away from snippets of program listings as reviews and general articles took over.

made tidy business (one of its authors earned royalties of around £35,000 on games originally written with no thought of profit), but in the end a market limited to a single model of microcomputer was insufficient to support a large games company.

Looking back at the early microcomputers is like looking at the fossils in ancient shale, before evolution took out three quarters of the species, some of them weirder than anything living today. The market had been entered by Apple, Commodore, Tandy (1977), Atari, Exidy (1978), Acorn (1979), Sinclair (1980), Osborne, IBM (1981) and a dozen others, whose machines were mutually incompatible in that software could not easily be transferred from one model to another. Text adventures were an exception, using little of the more complex hardware (for graphics and sound) which really differentiated designs: also because a typical adventure program is 90% map, text and other data tables, so that only 10% would need rewriting to move to a new machine. The more specialised design companies got this division down to a fine art, and 'Zork I' was offered for 23 different microcomputers.

Infocom was incomparably the largest of these specialist houses, the others directly employing five or six people at most. On paper the main rivals were, in America, Scott Adams's Adventure International (seventeen games, 1979–85); in Australia, Melbourne House (seventeen highly variable games from different sources); in Britain, Level 9 (twenty games 1981–91, founded by the brothers Pete, Mike and Nick Austin) and later Magnetic Scrolls (seven games 1984–90, founded by Anita Sinclair and Ken Gordon, 1984). In practice their markets – geographical and by computer ownership – overlapped little so that competition came not from each other, but from different genres of game.

Right through the ''golden age of text adventures'', around two-thirds of the perhaps 1,000 adventure games published mixed graphics with text, usually in the form of a picture accompanying each room description. Sierra, still a major player in the games industry today for its long-running *King's Quest* series, began this trend as early as 1980 with 'Mystery House' (Roberta Williams). Sales were so good that board game companies (Avalon Hill, Games Workshop) dabbled in the market, and spin-offs from books, film and television began to appear, though play seldom really engaged with the subject matter. When 'Dallas Quest' (James Garon, 1984) confronts the player with Miss Ellen, a bugle and a rifle, it is easy to guess which of the three will prove to be decoration. Spinnaker/Telarium Software's adaptations of two classics of science fiction, Arthur C. Clarke's 'Rendezvous with Rama' (Ronald Martinez, 1984) and Ray Bradbury's 'Fahrenheit 451' (Len Neufeld and Byron Preiss, 1984) deserve mention, though, as does the same company's

'Amazon' (1984), by the novelist and screen-writer Michael Crichton, later to become famous for *Jurassic Park* but already hot property in Hollywood. Thomas M. Disch, another novelist of real powers, went through a wild surge of enthusiasm writing 'Amnesia' (1986), to be followed by total disillusion when it was not marketed and received as a novel might be. ''The notion of trying to superimpose over this structure [i.e., the adventure game] a *dramatic conception* other than a puzzle was apparently too much for the audience.'' (*Interviews with Contemporary American Science Fiction Writers*, 1990). The poet Robert Pinsky was more obliging with puzzle-based play, as we shall see.

△ ''Once I was deluxe; now I am debris'' (Adrian Belew). 1980s graphics are often crude and few players can tolerate them, so that these 600 or so games lie in almost total neglect today and even Infocom's four late graphical titles are made playable on modern machines more out of piety than appreciation.† Nevertheless, graphical adventures were once formidable rivals and the idea that graphics should voluntarily be given up required selling. ''You'll never see Infocom's graphics on any computer screen,'' boasted early advertisements, making a virtue of necessity: the games were supposedly too evocative and too cerebral, as was implied by the photograph of a brain. It would be truer to say that Infocom's graphics were instead in the highly crafted and colourful booklet built into each game's box lid, which often contained clues (partly as an anti-piracy measure). Inspired perhaps by the success of Kit Wright's book of paintings *Masquerade*, which encoded the location of a buried golden hare, Acornsoft offered a prize for the first correct solution of 'Castle of Riddles' (Peter Killworth, 1984) which – it was laid on pretty thick – was so fiendish that the prize would take quite some winning. A similar prize for 'Eureka' (Ian Livingstone, Domark, 1984) offered a whopping £25,000. Another strategy was to extol the sophistication of a parser, and how very far it soared above the mulish ignorance of a shoddy two-word job. Thus Magnetic Scrolls's 'The Pawn' was sold partly on its celebrated claim to understand ''use the trowel to plant the pot plant in the plant pot''. Publicity for Melbourne House's 'The Hobbit', a huge success in Britain, stressed that only the presence on the programming team of an expert in linguistics (Stuart Richie) had enabled the invention of ''Inglish'', as the parser's subset of English was called. In a similar bid for dignity, Infocom soon distanced itself from the boy-scout ''adventure game'' and the nerdile ''computerized fantasy simulation'', instead billing its product first as ''Interlogic'' (1982) and then ''interactive fiction'' (1984), which remains the preferred euphemism today.

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† While Spectrum and early PC graphics are often unbearable, the Atari ST and Amiga offered a better colour palette and resolution: in these versions, the Magnetic Scrolls games were well illustrated. Of lower-resolution games, 'Asylum' (William Denman), 'Sherwood Forest' and 'Masquerade' (Dale Johnson) are recommendable.

Though cave games became old hat, more cohesive fantasies and overt miscellanies and treasure hunts had continued unabated as the mechanics of 'Advent' lived on in the guise of different genres. John Laird's 'Haunt' (begun 1978, and known to the authors of 'Zork') may in fact be the first non-cave game, but its vampire-haunted house has 'Advent'-like puzzles based on combining objects (throw turpentine on a poor painting to reveal a Rembrandt). 'Haunt' is not inspired, but the knockabout style and the unexpected arrival of James Watt from the Department of the Interior wanting to buy the house for $10,000,000 liven things up. Camp horror-movie settings, usually featuring Dracula or Frankenstein and set in large houses even more haphazardly stocked than caves (Chris Gray's 'Mansion' (1980) somehow works in a submarine), vied with science fiction and spy thrillers as the most popular variations. Alien worlds and derelict spacecraft, caves of steel so to speak, initially lent themselves to works of fairly high seriousness such as 'Starcross' (Dave Lebling, 1982), which is heavily indebted to Arthur C. Clarke's *Rendezvous with Rama* (again) and to Larry Niven's *Known Space* stories, from which it borrowed red and blue stepping discs. Level 9's 'Snowball' (Mike, Nick and Pete Austin, 1983), set on an interstellar colony ship, and Peter Killworth's 'Countdown to Doom' (1984) for Acornsoft and Topologika, set on Doomawangara (a hostile planet, not a region of the Australian outback), are equally steeped in golden-age science fiction.

More often, the future became a vehicle for comedy, usually in the form of sending up or camping up traditional science fiction, with one notable exception. Douglas Adams's radio series and novel *The Hitchhiker's Guide To The Galaxy*, the *Three Men in a Boat* of the 1970s, achieved enormous success. To computer hackers it became a devotional text, like the Monty Python sketches it owed considerable debts to,† especially in Adams's invariable practice of having the ''straight man'' in any conversation argue back. For all its playful anything-goes imagination, it is not a send-up but a genuine work of science fiction in the sense of social analysis: Adams mocks something large enough to be worth mocking, i.e., real life, rather than pulp sci-fi and flying-saucer movies. With an electronic, interactive encyclopaedia as narrator and an author fascinated by textual gadgetry, Adams's comedy was a natural for adaptation to adventure-game form and his collaboration with Steve Meretzky at Infocom produced their bestselling title (1984). Imitations became commonplace.

It is often forgotten, because this is not how we think of ''classic text

† 'Advent' quotes from Python's *Parrot Sketch*: try feeding the bird. As for Adams, 'Lord' has a babel fish and 'Acheton' a ningy.

adventures'', that many early games were earnestly or drably serious in tone. 'Advent' itself contains relatively little humour, despite one comedy room (Witt's End) and infrequent moments of drollery from the narrator:

> A glistening pearl falls out of the clam and rolls away. Goodness, this must really be an oyster. (I never was very good at identifying bivalves.)

The distinctive comedy running, sometimes only as an underground stream, through all of Infocom's games has its source instead in 'Zork' which, partly because it contains many more inessential responses than 'Advent' (responses, that is, which a player winning the game need never see), gives a much stronger impression of personality: shaped by 'Zork', by inheritance of parsing code from one game to another and by a shared in-house testing team, the strongest unity of style between the Infocom games is that they seem told by essentially the same narrator. This is a theme that will recur in §48.

With a growing catalogue in the mid-1980s, Infocom's mature style was to make conscious use of genre to differentiate its products, essential since a core audience, subscribing to a newsletter, had formed and would buy many of its titles: also, of course, for the fun of it. Any player dropped into the middle of one of 'The Lurking Horror' (H. P. Lovecraft horror), 'Leather Goddesses of Phobos' (racy send-up of 1930s space opera) or 'Ballyhoo' (mournfully cynical circus mystery) would immediately be able to say which it was. ('TLH', Dave Lebling, 1987; 'LGOP', Steve Meretzky, 1986; 'BH', Jeff O'Neill, 1985.) Infocom also evolved a police procedural ''detective novel'' format rarely used since, which differed from any number of spy intrigues in that it involved character interaction and a developing case, rather than simply an 'Advent'-style exploration in which an enemy base replaced the caves. Today's designers are not always so definite in keying a game to an established genre of fiction, but the first decisions remain to choose the style, the mood, the character of the protagonist and above all the fictional world of which the story itself will remain only a part.

Infocom achieved popular success in the mid-1980s and continues to be highly rated now, but to some extent for different games. The 1984 and 1985 bestsellers, 'The Hitchhiker's Guide To The Galaxy' and 'Wishbringer' (Brian Moriarty) are now found solidly mediocre, charming but insubstantial. Critical acclaim flickers instead to 'Trinity' (1986), as lightning flickers to an aerial, because the game opens with something of the mood of an art-house movie, because it is bookish and purposeful – a research bibliography is supplied – and because it is obtrusively trying to be what today's critics most wish to find: literature. Here is Brian Moriarty, a self-analysing and intensely driven designer, ambitious for worldly success but describing himself in the credits as a member of the Nathaniel Hawthorne Society, and a man who remains a

name in the games industry today:

> I amassed a pretty substantial library on the history of the atomic bomb . . . I went to the Trinity site [of Oppenheimer's first test] itself, visited Los Alamos and a lot of museums and I talked to a couple of people who were actually there . . . I wanted people, when playing the game, to feel their helplessness. Because that's what I felt when I was reading and talking to these people and seeing these places. You could just feel the weight of history on you.

'Trinity' is not altogether dark, nor innovative in its basic mechanics, with an extensive slice of 'Zork'-like terrain and some mischievous animals. A black cover with mushroom cloud wrapped a typically deluxe and supportive book-shaped package which included a map of the Trinity test site, a sundial, instructions for folding an origami crane and a spoof 1950s *The Illustrated History of the Atom Bomb* comic for boys (by Carl Genatossio). Sales were tepid at best, albeit in part because the game played only on larger and therefore less widely owned computers. Had it sold no further even than to his mother, though, Moriarty's reputation would still rest secure upon 'Trinity' today.

All the same, for the origins of the deliberate artistic statement in interactive fiction one should look further back. Mike Berlyn had been instrumental in subverting the genre's initial ''puzzles for treasures'' definition, and the closing scenes of his 'Infidel' (1983, with Patricia Fogleman), re-enacting the Egyptian *Book of the Dead*, are arguably the earliest to be guided for consciously literary ends. Where 'Infidel' is clearly a plotted novel, 'Mindwheel' (Robert Pinsky, coding by Steve Hales and William Mataga, Synapse, 1984) is a puckish dream-poem, Dante meets *Alice Through the Looking-Glass*. The protagonist wakes to find that one Doctor Virgil is guiding him to meet some popular entertainers (rock singers and baseball players), some chatty, debauched insects and ''your broccoli-coloured companion'', a frog who keeps up self-deprecating chatter throughout the game:

> ''Again!'' says the frog. ''Again we're in a situation of this kind. And I turned down a nice job, summer replacement for the little dog in Monopoly!''

But there are also transfigured victims out of Bruegel or Bosch, such as the children with the heads of birds who police the snowy, complacent mind of a Generalissimo. Opposition is provided by the more playful Spaw, a demon wearing ''lawyerskin boots''. Puzzles include sonnet-writing and an end-game based on human chess with different puzzles on each square, the player advancing pawn-like (there are several possible paths, since captures can be made) to the eighth rank. Pinsky – noted for semi-formal verse with a social aspect – was named the US Poet Laureate in 1997, and what he now calls his ''computerized novel'' is not easy to dismiss. 'Mindwheel' was the first of four nightmarish games by Synapse Software: 'Breakers' (Rod Smith, Joe

Vierra and William Mataga, 1986) is a tale of indentured labour with ''coercive interrogation techniques'' and the starship 'Essex' (Bill Darrah, 1985) lends a similar mood of persecution. Only 'Brimstone: The Dream of Gawain' (James Paul, David Bunch and Bill Darrah, 1985) – doubly unreal as a dream by an Arthurian knight – resembled ordinary adventure fodder. The line was terminated by Broderbund in 1986, which had bought the company but was now alarmed by a rape scene and some Chinese black magic. The computer games audience was sliding downward in age.

△ Infocom's intention to explore byways of the new medium was genuine, but not of course altruistic, and its business history throws a good deal of light on its decisions. The extent of Infocom's commercial success is often exaggerated, not in its scale (at one time a quarter of U.S. homes owning computers had bought the product) but in its duration. Typical sales per new title rose from 10,000 in 1981 to 50,000 in 1983–6, falling below 20,000 again in 1987–9. The exceptions were the 'Zork' trilogy, which sold 1,000,000 units over the decade – which explains if not excuses the later sequels – and 'The Hitchhiker's Guide To The Galaxy' at 250,000, which explains Infocom's eagerness to write 'The Restaurant at the End of the Universe'. Sales were further buttressed by customer loyalty, carefully nurtured by large direct mail shots (at end of 1986, circulation of the newsletter was 240,000); by repackaging of 1980–2 titles; and by a no-returns policy in distribution (ended in 1987) obliging shopkeepers to treat Infocom's wares as luxury goods, kept on shelves until they sold. Remarkably, 'Suspended' (1983), not an obvious money-spinner, was to receive a Gold certificate for 100,000 sales in 1986: typical shelf times today are measured in months or even weeks. Infocom's customers were, according to market research, adult (75% over 25) – which is not so surprising given prices of $40 to $50 – and heavy readers, 80% of them men, though specific products were designed to appeal to women (such as 'Plundered Hearts' and the mysteries) and to children (Stu Galley adapted the 'Seastalker' parser to children's sentence structures, observed during testing). The work force had grown fast (1981, two; 1982, four; 1983, twenty; 1984, fifty; 1985, one hundred) but was increasingly preoccupied with managing itself and with Infocom's one business product, the database 'Cornerstone' (1986). It was intended to capitalise on Infocom's expertise in virtual machines, which allowed large programs – adventure games – to run on a variety of different designs of small computer: but this was not the strength in 1986 that it would have been in 1982, since the IBM PC had grown in capacity and cornered the business market, most of the rival manufacturers having gone bust in 1983–4. 'Cornerstone' sold 10,000 but only after a price reduction from $495 to $100, and by then Infocom had turned the corner into loss. In June 1986 Activision had bought Infocom, in what amounted to an agreed merger, for stock valued at around $8 million: at about five years' gross income, this was a high price, or would have been if the stock had in fact been worth that. Infocom still had fifteen titles ahead, including a few of its best, but disputes over branding, marketing and the division of profits and losses produced disquiet, as did a time-consuming lawsuit about the

state of the books when the company changed hands; while Activision had its own travails. Expected sales from the Hitchhiker's sequel 'Restaurant' were an essential part of the business plan every year from 1985 to 1989, while Meretzky, Lebling, Jeff O'Neill and Amy Briggs were each briefly in the frame as the unlucky programmer. The project was stymied in 1985–6 by Douglas Adams's inability to get out of the bath when copy deadlines loom – "you can't fault him for personal hygiene in a crisis" (Geoffrey Perkins) – and by 1987–9 meant impossible collaborations with the British firm Magnetic Scrolls and other intermediaries, whom the Implementors were unable to establish working relationships with. Games by out-house employees got a little further: though Berlyn's came to nothing, Blank wrote 'Journey' from California and newcomer Bob Bates designed 'Sherlock' and 'Arthur'. (Bates worked from his notionally independent company Challenge, but its finances were at that time heavily dependent on advances from Infocom.) Without conscious decision, Infocom was becoming a commissioning house rather than a workshop. The testing department was involved so late on that the new management saw it as largely an obstruction. Artistic collapse came in 1988, when four of the six remaining creative figures were fired or felt unable to go on (editor John Prince, tester Liz Cyr-Jones, Implementors Jeff O'Neill and Amy Briggs). Meretzky and Lebling remained, sometimes despondent, sometimes cheerful, doing largely terrible work. The weekly game-design lunches became at the last a charade, attended by random managers whom they barely knew. Infocom never went bust as such, but by 1989 market conditions would have obliged any management to salvage the Infocom brand-names while abandoning text for largely graphical games. The company now called Activision (following a second, happier merger) did just this with a fresh generation of game designers in the 1990s. For all that they were doing something quite different and thousands of miles away, many had a keen sense of standing in an Infocom tradition. Activision's omnibus 1990s reissues of the Infocom text games achieved unexpectedly high sales, to everybody's pleasure.

§46.3 The growth of a community c. 1985–91

One by one, the companies ceased to publish text-based games: Adventure International (1985), Synapse (1986), Infocom (1989), Level 9 (1991), Topologika (1992), Magnetic Scrolls (1992). The last stalwart, Legend Entertainment – which had inherited two of the designers of Infocom's last days, Bob Bates and Steve Meretzky – made the last mainstream release of a game with a parser in 1993 ('Gateway II: Homeworld', by Mike Verdu and Glen Dahlgren) and so, according to some, the dark ages began: the adventure games which flourished in the marketplace were fiction of a kind, and steerable, but no longer interactive in any conversational sense. Yet the same advance of technology which drove the irresistable rise of graphics and animation also brought interactive fiction writing into the home. Between 1980 and 1990 the

personal computer went from being barely able to play a text game to being easily able to compile one.

To be able to program a PDP-10, as Crowther and Woods had, was a professional qualification, but early microcomputers came with the easily learned programming language BASIC built in, and also with manuals which emphasised that computers were more for writing your own programs than for using other people's. Minimal adventure programming is not complicated – indeed adventure game-writing has been used to teach children about computing (*Creating a Database*, 1985, Steve Rodgers and Marcus Milton) – and the slowness of a program written in BASIC does not much matter for a text adventure. So, parallel to the commercial market and at the cheaper end merging into it, hobbyists had had been devising their own adventures since at least May 1979, when Lance Micklus published 'Dog Star Adventure' in a computing magazine. This was the first of many type-it-in-yourself games which some readers, at least, adapted and reworked as they typed. Scott Adams's 'Adventureland' source was itself published in *Byte* (1980) and, within a year, reworked into the core of Brian Howarth's rival 'Mysterious Adventures'. (No less than three Scott Adams-format adventure-making programs existed for the TI-99/4a microcomputer alone, and Adams-format games in circulation outnumber his official titles by at least three to one.) Dozens of books with titles like *Adventure Games For Your Commodore 64* (Duncan Quirie, 1984) consisted of little more than unannotated and – partly because of the need to save every possible byte of memory – almost incomprehensible BASIC listings, often rushed into print by coders with more enthusiasm than skill, and seldom properly tested.

The major companies each had in-house systems for designing adventure games (see §41 for a sample of Infocom's ZIL): these never emerged into the public eye. But a popular design tool called *The Quill* (Graeme Yeandle, 1983), running on the Sinclair Spectrum and Commodore 64 microcomputers, allowed many hobbyists working from home to sell their wares. Yeandle's generous acknowledgement in the manual that the system ''has its origins in an article written by Ken Reed and published in the August 1980 issue of Practical Computing'' is further testament to the influence of 1979–80 magazines in spreading the word. At least 60 commercial releases in the period 1983–6 were Quilled. (*Graphic Adventure Creator* (Sean Ellis, 1986), was also popular later on. Two corresponding American commercial systems, *Adventure Writer* and *Adventure Master* were less fruitful.) Yet tiny BASIC games were inevitably toy models of the real thing, and even *The Quill* could not then build a port of 'Advent' (though extensions of it, such as the *Professional Adventure Writer* (1987), later did), let alone an Infocom-scale game.

Some 33 non-commercial design systems are now present at `ftp.gmd.de`, though some have fallen into disuse, some are flimsy at best and others are exercises in writing a Pascal-like compiler, or a LISP-like compiler, which pay too much attention to syntax and do not engage with the real issue: the world model and how designers can work with and alter it. During 1995–9, only two systems have been widely used: the Text Adventure Development System (or TADS, Mike Roberts, 1987) and Inform (Graham Nelson, 1993). A further two retain interested minorities and remain in the running: Hugo (Kent Tessman, 1994) and revamped forms of the Adventure Game Toolkit (AGT, David R. Malmberg and Mark Welch, 1985–7). Note the dates, implying both the durability of a capable system and the difficulty in getting a new one off the ground. All four have been continuously developed since their inception, to some extent bidding each other up in richness or complexity.

Design systems of the 1980s had the consistent ambition of easing the way of the neophyte programmer, who would if possible never be asked really to program at all: only to supply textual descriptions, in effect filling in a database. "Alan is not a *programming* language. Instead Alan takes a descriptive view," says its manual (by Thomas Nilsson), and the Generic Adventure Games System manual (Mark Welch) concurs:

> It [GAGS] *cannot* be used to write an adventure game with as many complex features as Infocom's. To do so . . . would require adventure-game writers to learn a very complex set of rules.

This is the bargain that was, with some reluctance, accepted around 1992 – a crucial year, as we shall see.

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Changing conditions of computer networking have, throughout this story, had greater effect than the changing technology of the computers themselves. In the late 1960s and early 1970s, tools such as Unix and games like 'Space-war!'spread through outposts of the early Internet much as, in the dark ages, classical texts flowed down monastic libraries along the Rhine and the Loire, always subtly rewritten until it seemed no definitive version remained. (We have already seen what this did to 'Advent'.) By the mid-1980s, universities and institutions across at least the Western world were securely networked, but the same could not yet be said of home computers and small businesses.

Enthusiasts for writing interactive fiction could achieve little until there was enough mutual contact for non-commercially distributed design systems and games to spread around. Usenet, a wide-ranging system of discussion forums or "newsgroups", was created in 1979 and roughly doubled in usage each year: but in 1985 it still only accounted for 375 postings per day, across

all topics combined, and as late as 1989 it was still possible for a single person to skim through the entire traffic. In America, the hundreds of local dial-up bulletin board systems (BBSs) and their big brother, the American CompuServe service, had greater effect. Much as the creators of Usenet called it "the poor man's ARPANET", bulletin boards were a poor man's FTP: allowing downloading of files from archives with only a modem and without the need for a university or corporate Internet connection. Even as late as 1993, downloads of 'Curses' (say) from CompuServe rivalled those from `ftp.gmd.de`. From 1982, when the concept of "shareware" was invented, quality home-made software was routinely "shared" on these boards and via discs ordered from the Public Software Library, subject to a moral obligation for users to "register" by paying the original author a small fee. TADS and some of the better early TADS games were administered as shareware by High Energy Software, a company with its own BBS. AGT was also available from the BBS community, and the Byte Information Exchange, and as discs which could be ordered from Softworks, a member company of the Association of Shareware Professionals.

Judith Pintar's story (from an interview in *XYZZYnews* 11) shows how fruitful this contact could be:

> I started writing IF in the mid-80s, when the XT I bought happened to have GAGS [1985] on it ... When I joined CompuServe in 1990, I tried to find Mark Welch, to register GAGS, and discovered that it had become AGT and was administered by the co-author, David R. Malmberg. He had run several annual game-writing contests, and I was determined to enter ... 'CosmoServe' [1991] tied for first place. [In 1992] I had the idea of writing a game as part of a group venture. I posted this idea in CompuServe's Gamer's forum, and a small group of people responded. ... We were given a private area on the forum to post our messages to one another and to share game files.

'Shades of Gray' (1992), by Mark Baker, Steve Bauman, Elizabeth Ellison, Mike Laskey, Hercules, Cynthia Yans and Pintar herself, duly won. The AGT contest began as a GAGS contest in 1986, to promote interest, then ran annually 1987-93 and, though no longer tied to any game design system, essentially resumed in 1995 as the `rec.arts.int-fiction` competition.

§46.4 Newsgroups and revival 1992–

The rest of the infrastructure of the present interactive fiction community was created by four almost simultaneous events: first, the creation of specific Usenet

newsgroups (on or before 21 March 1992, 21 September 1992), moving away from sporadic and easily drowned-out talk in the early `net.games` and the later `rec.games.programming`, while asserting an artistic medium by moving to the `rec.arts.*` sub-hierarchy, where theatre and the novel are also discussed. Next, the founding of the interactive fiction archive at `ftp.gmd.de` by Volker Blasius and David M. Baggett (24 November 1992), the release of TADS 2.0 (6 December 1992), significant because it established the dominance of TADS, and the release of Inform 1 (10 May 1993), though not until 1995 was Inform seriously used.

The proximity of these dates is no coincidence: they followed the sudden, widespread and cheap release of the entire Infocom back catalogue, in two volumes, *Lost Treasures of Infocom I* (January 1992) and *II* (July 1992), which stimulated a revival both of the cult of Infocom and of interactive fiction in general. If Infocom is to be compared with Shakespeare then this was the First Folio. Anybody who had occasionally liked Infocom's games in the past suddenly had all of them, while players' expectations of quality rose. Infocom antiquarianism occupies much of the early newsgroup traffic; much of the initial stock at `ftp.gmd.de` consisted of fact-sheets on Infocom story files; and the collectors of these diamonds were provided with a rhinestone machine when Inform, which compiled Infocom-format story files, appeared. Design systems successful in the mid-1980s, which were not well-adapted to build Infocom-scale games, quickly died out. Instead TADS and Inform were used for a clump of large games plausibly imitating Infocom's production values, among them 'Save Princeton' (Jacob Solomon Weinstein, 1992), 'Horror of Rylvania' (Dave Leary, 1993), 'Curses' (Graham Nelson, 1993), 'The Legend Lives!' (David M. Baggett, 1993), 'Theatre' (Brendon Wyber, 1994), 'Christminster' (Gareth Rees, 1995), 'Jigsaw' (Graham Nelson, 1995), 'Perdition's Flames' (Mike Roberts, 1995) and so on.

The revival by Gerry Kevin Wilson of an annual game-designing competition, fondly remembered by AGT and CompuServe users, took place in September 1995, though the 1996 event (with 26 entries) marked the beginning of its real importance. There was no restriction to any specific design system, as was typical of a newsgroup which has consistently voted against dividing itself off into subsections such as `comp.lang.tads` or `comp.lang.inform`. However, the rule that a contest game should be solvable in two hours, albeit often more honoured in the breach, has had a decisive effect in diverting designers from Infocom-sized "novels" into short stories. This freed up the form for greater experimentation, but meant that few large games were created in the late 1990s. The annual September event – shrewdly timed, after long university vacations – has also had the unfortunate effect that games are held back and

then all released at once, in the breaking of a monsoon after a parched summer. But for the quantity of fine work stimulated, and the number of newcomers attracted, the competition can only be considered a triumph. Its success has also spun off a number of alternative contests and forms of recognition, such as the annual and Oscar-like XYZZY Awards. The most ludic, madcap events are the SpeedIF contests, begun by David Cornelson in October 1998, in which just two hours are allowed to write a complete game. The rubric for SpeedIF 13: ''The game will take place in a Chinese restaurant. It will feature one or more of the following animals: pigeon, elephant or badger. There will be some kind of sculpture made of mud, and some character will be obsessed with either HAL or Doraemon, the robot-cat from the future (or both)...''

A growing appreciation of the medium's potential for art has characterised turn of the century interactive fiction. One provocative example was Nick Montfort's showing of a *hardback* edition of 'Winchester's Nightmare' at Digital Arts and Culture in Atlanta, in October 1999: ten decommissioned laptops converted to run an Inform game. Formerly property of the Internal Revenue Service, several still bore the U.S. Treasury seal of an eagle holding a key. Even shown in images on a web page, it was startling as a work of conceptual art, and challenged the unconscious assumption that an interactive fiction need be intrinsically unlike a material book. Chris Klimas's affecting short story 'Mercy', and Andrew Plotkin's shifting vignette 'The Space Under The Window', were influential in the late 1990s style for non-game games. Marnie Parker organises art shows which challenge traditional aspirations for IF by encouraging artistic expression. Making an exception to this chapter's general rule of stopping history at the close of 1999, it seems appropriate to finish with two fine debut pieces which took awards in the 2000 Art Show: 'Galatea' (Emily Short, 2000), a conversation with an animated sculpture which breaks new ground in interactive dialogue; and 'The Cove' (Kathleen Fischer, 2000), an evocative seascape which is also a gathering of memories. Interactive fiction will always appreciate what in theatre used to be called ''the well-made play'', the polished entertainment on traditional lines, but without its radicals it will die. Though the grail of puzzle-free yet interactive literature seems as elusive as ever, it is too soon to stop looking.

△ And what of the history of the *theory* of interactive fiction? For most of the last twenty years, the best published sources are chapters which, like this one, hide at the back of books on game programming: thus, Chapter 8 of Peter Killworth's *How to Write Adventure Games for the BBC Microcomputer Model B and Acorn Electron* (1984), Chapter 7 of the Alan manual, Appendix B to the TADS manual. (Even people who don't intend ever to use TADS should read the delightfully written TADS manual.) Most are couched in the form of avuncular advice (''No matter how small an Adventure you

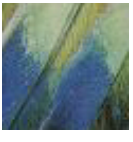
write, it will take far, far more time and effort than you thought it would'' – Killworth) but there are often clear signs of groping towards a systematic critical model of what the essential ingredients of a game might be. *Basic Adventure and Strategy Game Design for the TRS-80* (Jim Menick, 1984), a turgid work, talks about ''layering'' complications into ''phases''. Others, such as A. J. Bradbury's book, quoted above, or the somewhat gauche *Player's Bill of Rights* (Usenet posting, 1993), boil opinions down to (usually ten) golden rules. Bradbury's are well-supported by argument and engage with the underlying fiction and not simply the surface puzzles: for instance, ''resist the urge to create a superhero'' of the game's protagonist.

• **REFERENCES**

For interactive fiction history, see the *Infocom Fact Sheet* by Paul David Doherty, the *Level 9 Fact Sheet* by Miron Schmidt and Manuel Schulz and the *Magnetic Scrolls Fact Sheet* by Stefan Meier and Gunther Schmidl. Hans Persson's *Adventureland* catalogue and the master index of `ftp.gmd.de` are also indispensable. On connections with literary precursors, see Gareth Rees's 1994 article *Tree fiction*. The number of games said to have origins before 1979 is somewhat akin to the number of American families claiming descent from the *Mayflower* pilgrims and one must approach claims to priority with caution. But it is clear that too little is known about the games libraries in circulation in the mid-1970s. Peter Langston's 'Wander' (1974), a text-based world modelling program included in his PSL games distribution for Unix and incorporating rooms, states and portable objects, was at least a proto-adventure: perhaps many others existed, but failed to find a Don Woods to complete the task? So much appears lost that even Crowther's original source code, the most important document we might want to see, appears not to have existed anywhere since 1977. (Crowther confirms that he now has no printouts or notes of it.) In the discussion of authorship above I have therefore relied on anecdotal accounts in print quoting Crowther and Woods, and on recent and valuable research by Dennis G. Jerz. •*The Longest Cave*, by Roger Brucker and Richard Watson, includes a history of the Bedquilt Cave. •It is difficult to estimate the extent of the literature with any reliability. The `ftp.gmd.de` archive contains over 1,700 games which have been finished and offered to some kind of audience, and this necessarily excludes some material still under copyright or simply lost. Hans Persson's catalogue (surely incomplete) lists around 800 commercial publications in the 1980s, of which 330 are purely textual. The well-established canon of ''important'' or ''classic'' games still talked about today consists of about 100 titles. At most fifty titles of the 1990s remain in regular play through being rediscovered. •*The Quill* and its variants continued even into the 1990s, at least for the prolific Dorothy Millard, whose games are off-beat variations of ''you are stranded'': the most off-beat of all being 'Yellow Peril' (1994), in which the entire world has become yellow. •1993 was the year of the explosion of the World Wide Web, during which it grew by a factor of 3,000. But in 1992, personal web pages barely existed, and it seemed not only natural but unavoidable to house games at a centralised library, `ftp.gmd.de`. The continued importance of this IF-archive is a major part of the solidarity of today's community.

§47 Realities

> As we ranged by Gratiosa, on the tenth of September, about twelve a clocke at night, we saw a large and perfect Rainbow by the Moone light, in the bignesse and forme of all other Rainbows, but in colour much differing, for it was more whitish, but chiefly inclining to the colour of the flame of fire.
>
> — Arthur Gorges, ordinary seaman aboard Sir Walter Raleigh's expedition (1597)



''Explain why the game-world exists and thus give a consistency to the text that you will present to the player'' (Thomas Nilsson, in the Alan manual). It is worth a look back to compare 'Advent' and 'Zork', the alpha and omega of the cave game. 'Zork' is better laid out and its middle segments (now called 'Zork II') are among the smoothest and best structured of any game in the literature. And yet for all its dead ends and hidden canyons, 'Advent' is essentially the better work, more memorable and more atmospheric, because its roots lie in a true experience. The mythology of 'Zork' is far less well-grounded: the long-gone Flathead dynasty, beginning in a few throwaway jokes, ended up downright tiresome by the time of the later sequels, when the ''legend of the Flatheads'' had become, by default, the distinguishing feature of Zorkness. Though perfectly engineered, 'Zork' lacks authenticity.

The most telling argument in favour of a clear fictional backdrop is provided by the games which did not have one, and which were merely surreal miscellanies of the medieval and the modern. A very few, such as 'Brand X' by Peter Killworth and the chess grandmaster Jonathan Mestel (1982: later called 'Philosopher's Quest'), came stubbornly alive through their ruthless difficulty. 'Brand X' lacks even a descriptive title – there is no setting or plot to describe – and the overture reads: ''You don't need instructions, so you won't get any.'' But in the main such games are indistinguishable from each other and are justly forgotten.

. . . . .

Here is a revealing moment from 'The Hitchhiker's Guide To The Galaxy' (Steve Meretzky and Douglas Adams, 1984):

> Ford yawns. ''Matter transference always tires me out. I'm going to take a nap.'' He places something on top of his satchel. ''If you have any questions,

> here's The Hitchhiker's Guide to the Galaxy'' (Footnote 14). Ford lowers his voice to a whisper. ''I'm not supposed to tell you this, but you'll never be able to finish the game without consulting the Guide about lots of stuff.'' As he curls up in a corner and begins snoring, you pick up The Hitchhiker's Guide.

Why does Ford feel the need to whisper? Who supposes that Ford should not say such things? Roger Giner-Sorolla does, for one. His 1996 essays *Crimes Against Mimesis* put the case for the prosecution of such passages:

> I see successful fiction as an imitation or ''mimesis'' of reality, be it this world's or an alternate world's. Well-written fiction leads the reader to temporarily enter and believe in the reality of that world. A crime against mimesis is any aspect . . . that breaks the coherence of its fictional world as a representation of reality.

This elegant polemic, posted to `rec.arts.int-fiction`, provided the *mise au point* for a debate which rumbled on for some months.† The target was not so much the tripping over of mimesis in a pratfall, as in the passage above, but the accidental undermining of mimesis by careless authors. The placing of objects out of context or of characters without motivation, the bending of genres to include whimsical anachronisms or the use of puzzles which are out of context (a sliding block puzzle to solve in a ruined crypt) are problematic because they emphasise exactly what ought to be concealed, that the game is a collection of puzzles to solve. From this view it follows that a game should have a coherent fictional world and its puzzles should be seamlessly joined to the textual fabric, appearing to occur naturally.

. . . . .

The secret of success in designing the backdrop is originality: once you can imitate that, all else will follow. Probably the most popular source is real life, and for many games design begins with, and is periodically interrupted by, research. If constructing geography, maps of real mountain ranges, river valleys and cave systems can be a helpful reminder that real geography is convoluted and continuous – if a river passes through a given location, it must continue elsewhere, and so on. (More on this in §51.)

For 'Jigsaw' (Graham Nelson, 1995), a game containing historical re-enactments, the present author began by wandering along the open shelves of Oxford County Library with pockets full of coins to photocopy pages at random. Later there came the 1956 run of the *Eagle* comic in facsimile (for views of the British Empire at the time of Suez as expressed in fiction for boys),

† To be parodied in Adam Thornton's game 'Sins Against Mimesis' (1997).

the Apollo 17 Lunar Surface Journal (Eric Jones's superb Internet resource, now officially adopted by NASA) and, for the 1900 sequence of the game, Stephen Poliakoff's excellent film *Century*. As this may suggest, research can be overdone. Here is Stu Galley, on writing the Chandleresque murder mystery 'The Witness' (1983):

> Soon my office bookshelf had an old Sears catalogue and a pictorial history of advertising (to help me furnish the house and clothe the characters), the *Dictionary of American Slang* (to add colour to the text) and a 1937 desk encyclopaedia (to weed out anachronisms).

And so we walk up the peastone drive of the Linder house to meet Monica, who has dark waved hair and wears a navy Rayon blouse, tan slacks and tan pumps with Cuban heels, and she treats us like a masher who just gave her a whistle. In a game which is intended to be a little kitsch, this is all in good fun. In a more serious work it would be way off balance.

. . . . .

Book adaptations present two main problems for interactive fiction. Plenty have been made: Frederik Pohl's *Gateway*, a masterpiece of "hard" science fiction, and the books of J. R. R. Tolkien, Terry Pratchett and Enid Blyton have all lent their extensive imaginary worlds. But in each case by permission. Even if no money changes hands, copyright law is enforceable until fifty or seventy years (depending on jurisdiction) after the death of the author or the author's spouse. There are nineteenth-century novels still subject to copyright and numerous characters have been trademarked. Some literary estates, that of Tintin for instance, are highly protective, and the rights managers of Anne McCaffrey's "Dragon" books or Paramount's *Star Trek* franchise are assiduous in watching for abuse of their property by authors on the Internet: understandably, since a venture by Marion Zimmer Bradley in authorising fan fiction ended in miserable litigation. The Commodore 64 game 'HitchHiker-64' (Bob Chappell, 1984), an unauthorised work loosely based on Douglas Adams's comedy had to be hastily rewritten as 'Cosmic Capers', with the Ravenous Bugblatter Beast of Traal becoming the somehow less satisfying Barbaric Binge Beast of Bongo.

The second problem is that, in any case, a direct linear plot simply does not work as an adventure game and a novel is too long for a game, just as it is for a film: both are nearer to a longish short story. Dave Lebling reckoned 'Shogun' (1989), an authorised version of James Clavell's epic novel, the worst not only of his own games but of all Infocom's too. (Graeme Cree: "Too often the story just seems to go on around you while you get meaningless points for smiling, nodding, or bowing at the right times." Torbjörn Andersson:

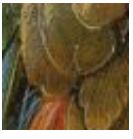
''it never lets you stray more than a few baby-steps from the pre-determined story''.) 'Sherlock' (Bob Bates, 1987) was on the whole more successful, not because Conan Doyle is more interesting – he is so familiar that the reverse is true, and besides, Bates overplayed the camp humour – but because the game was a pastiche, not a slavish adaptation. The same can be said of 'Wonderland' (David Bishop, 1990), one of the few Alice-based games not to follow the text. Shakespeare's 'The Tempest' has been adapted at least twice for interactive fiction (David R. Grigg, 1992; Graham Nelson, 1997) but Jonathan Partington's confection of Shakespearian settings, 'Avon' (1982), is more fun than either. Puzzles range across most of the plays in a mad rush, from hiding in a laundry basket (*The Merry Wives of Windsor*) to borrowing three thousand ducats (*The Merchant of Venice*) and one is really best advised not to eat the pie from *Titus Andronicus*.

• **REFERENCES**

The tension between open-ended simulation and narrative has attracted much comment. David Graves's three papers *Second Generation Adventure Games* (J. of Computer Game Design, 1987) have little to say. Gerry Kevin Wilson observes that ''The Minimalists argue that games should be an experience in exploration and simulation. They want to be able to start their own plots and toss them aside at will. In my opinion, they are very dangerous people.'' Mike Roberts, in the appendix to *The TADS Author's Manual*, writes: ''Adventure games all have a major problem: they pretend to be what they're not ... Adventures are simulations. Unfortunately, most adventures claim to be simulations of the real world... The key is to choose a small universe that you can model completely.'' He develops this idea of self-containment by suggesting that design should concentrate on a single important usage for each object, with irrelevant connections added only later.

§48 A triangle of identities

> "Queer grammar!" said Holmes with a smile as he handed the paper back to the inspector. "Did you notice how the 'he' suddenly changed to 'my'? The writer was so carried away by his own story that he imagined himself at the supreme moment to be the hero."
>
> — Sir Arthur Conan Doyle (1859–1930), *Three Gables*



In books like this one the word "player" is overused. There are at least three identities involved in play: the person typing and reading ("player"), the main character within the story ("protagonist"), and the voice speaking about what this character sees and feels ("narrator"). There is a triangle of relationships between them, and it's a triangle with very different proportions in different games.

1. Protagonist and player. "What should you, the detective, do now?" asks 'The Witness' pointedly on its first turn. Numerous games ('Zork', for instance) take the attitude that anyone who turns up can play, as themselves, regardless of gender or attitudes. This is to equate player with protagonist, making them almost the same. Sometimes the equation is actually engineered: 'Leather Goddesses of Phobos' notices into which bathroom the player chooses to move the protagonist and decides the protagonist's gender accordingly. 'Seastalker' (Stu Galley and Jim Lawrence, 1984), aimed at a younger audience, asks for the player's name and gives it to the protagonist, too. At the other extreme is Amy Briggs's much underplayed 'Plundered Hearts' (1987), which has as its heroine a specific girl whisked away by pirates in the West Indies. Reviewing in *SPAG* 4, Graeme Cree wrote that:

> In 'Zork', you're just some anonymous guy who was walking by the white house. You have no particular personality, or history before this point. 'Planetfall' makes an effort to paint your character with the enclosed diary, but it is all chrome . . . 'Plundered Hearts', more than any other game gave me the feeling of really being inside someone *else's* head. Throughout the game, who you are plays an important part. Disguising your identity and altering your appearance is important in several places to elicit a desired reaction from other characters . . .

Either approach presents difficulties. If the protagonist is uncharacterised, the story may lack literary interest. If heavily determined, the protagonist is likely to be highly unlike the player and this risks losing the player's sense of engagement.

△ Few players have minded becoming the Reverend Stephen Dawson, the middle-aged clergyman of 'Muse, an Autumn Romance' (Christopher Huang, 1998), whose behaviour is constrained by his emotional blockage. But there are players who resent being obliged to identify with gay protagonists. On the whole this is their problem, not the game's, and it was for them that Neil James Brown wrote his pointed spoof 'The Lost Spellmaker' (1997), the exploit of Mattie, a lesbian dwarf Secret Service agent addicted to sweets.

. . . . .

In an interactive medium, the beliefs and abilities of the protagonist are more than simply a painted backcloth, because the player participates in them. These special abilities might be called the ''magic'' in the game's model world, in the broadest sense:

> For magic and applied science alike the problem is how to subdue reality to the wishes of man.

(C. S. Lewis, *The Abolition of Man*.) In 'The Witness', for instance, the magic might be said to be the detective's ability to arrest or call for forensic analysis, and in 'Ruins' we have the camera and the packing case. The magic is the imaginary fabric of the world, and it is as essential for the magic to have a coherent rationale as it is for the map to suggest a coherent geography.

Because the magic is part of the background, it should not be allowed to become too crudely a way to solve puzzles. An ''open door'' spell should be a general technique, with several different applications across its game. Better yet, these techniques should be used indirectly and with ingenuity, for instance opening a locked door by casting a ''cause to rust'' spell on its hinges. And plenty of puzzles should have solutions which don't involve the magic at all, or else the player will start to feel that it would save a good deal of time and effort just to find the ''win game'' spell and be done with it.

△ In a few games a linguistic surrealism is the reality: for instance 'Nord and Bert Couldn't Make Head or Tail of It' (Jeff O'Neill, 1987) is entirely based on puns and the T-Removing Machine of 'Leather Goddesses of Phobos' can transform a rabbit into a rabbi. A literary critic might call this a ''postmodern'' magic, which dislocates language from what is ''really'' happening in the game. This is exceptionally hard to do well.

△ Games with magic in the authentic fantasy sense seldom follow the austere example of Tolkien, where – although there are spells, as where Gandalf sets light to fir cones in (the book) *The Hobbit* – the sign of a wizard is more often a priest-like ability to question out motives in what people say and a sage-like wisdom about nature and history. Instead, perhaps for easy parsing and convenient subdivision and perhaps simply to imitate Gary Gygax's role-playing game *Dungeons and Dragons*, interactive fiction has

tended to follow the *Dying Earth* stories (c. 1950) of Jack Vance† where spells are at once dramatic flourishes, complex mental exercises which must be memorised, and highly specific tools with outré names like "Xarfaggio's Physical Malepsy" and "The Excellent Prismatic Spray". Many schemes of magic have been tried, and naturally each designer wants to find a new one. Sometimes spells take place in the mind ('Enchanter'), sometimes with the aid of certain objects ('Curses'); sometimes halfway between (Level 9's 'Magik' games, David Williamson and Pete Austin, 1985–6). Keying magic to objects is advantageous because objects are tactile and part of the game's other play. In other respects, too, magic needs to be subject to the discipline of being easily subdivided and described. "Change a belt or staff into a small poisonous serpent" is far more amenable to designing (and parsing) than "convert up to 1000 cubic feet of rock to mud or quicksand".

△ If the map is very large, or a good deal of moving to-and-fro is called for, designers have frequently used magic to provide rapid transport: such as the magic words in 'Advent', or the eight colour-coded collars in 'Dungeon Adventure', or the teleport booths in 'Planetfall' (Steve Meretzky, 1983), or the black and white dots in 'Adventure Quest' (Mike, Nick and Pete Austin, 1984, 1983). Finding and deducing how to use this transport system can be a puzzle in itself, one whose solution is optional but rewarding.

. . . . .

2. Narrator and protagonist. Some narrators behave like a French "new novelist", reporting only what the protagonist is currently seeing and doing. Others enjoy access to what the protagonist thinks and believes:

> Aunt Jemima has two cats, Jane and Austin, but she finds Austin especially annoying – this ought to make Austin your natural ally, but as it is you tend to glower at each other.

Here the narrator of 'Curses' (Graham Nelson, 1993) tells the player that the protagonist doesn't like somebody. In a different game this could have been established by events, showing rather than telling. Indeed, the protagonist's relationship with Austin might have been neutral until established by the player's choices.

It is the narrator who speaks the game's opening words, sometimes called the "overture" and conventionally used to say what sort of person the protagonist is, and what he or she is trying to do. Overtures vary widely in how direct and indeed how honest they are. Many, like 'Curses', leave the player guessing or misdirect as a form of tease. This is a reaction against the overture style of the 1980s, exemplified by 'Snowball' (original version):

† Though Dave Lebling cites the *Earthsea* novels of Ursula K. LeGuin as the main influence behind 'Enchanter'.

> The interstar freezer, Snowball 9, has entered its target starsystem. And it will soon enter the star unless you can do something!

Such directness was itself a necessity considering that players of the day expected any game to be a treasure hunt unless they were told otherwise. The overtures to quest games became highly predictable: here is 'Enchanter' (Marc Blank and Dave Lebling, 1983):

> You, a novice Enchanter with but a few simple spells in your Book, must seek out Krill, explore the Castle he has overthrown, and learn his secrets. Only then may his vast evil. . .

And so on and so forth. What makes such briefings disappointing is partly that they often run on far too long and are full of words like "dread" and "imbue", and either take themselves very seriously or, which is worse, don't. Here is about a quarter of the "overture", or opening text, of 'Beyond Zork' (Brian Moriarty, 1987), a game not meant as a comedy:

> Y'Gael's dry chuckle stilled the murmur of the crowd. "You forget your own history, Gustar. Are you not author of the definitive scroll on the Coconut of Quendor?"
>
> A tumult of amphibious croaks and squeals drowned out Gustar's retort. Y'Gael hobbled over to a table laden with mystical artifacts, selected a small stone and raised it high.
>
> "The Coconut is our only hope," she cried, her eyes shining in the stone's violet aura. "Its seed embodies the essence of our wisdom. Its shell is impervious to the ravages of Time. We must reclaim it from the Implementors, and hide it away before its secrets are forgotten!"

Self-indulgent, self-parodying, slack, told in the past tense, uninteractive and basically dumb. If Moriarty felt that the quest of the game was hackneyed, a better response would have been to restructure the game, not to allow the narrator to show disdain for it. The same author's overture to 'Trinity' was by contrast honed to perfection:

> Sharp words between the superpowers. Tanks in East Berlin. And now, reports the BBC, rumors of a satellite blackout. It's enough to spoil your continental breakfast.
>
> But the world will have to wait. This is the last day of your $599 London Getaway Package, and you're determined to soak up as much of that authentic English ambience as you can. So you've left the tour bus behind, ditched the camera and escaped to Hyde Park for a contemplative stroll through the Kensington Gardens.

A good deal has been achieved in these two paragraphs. Apart from details – mention of the BBC, of continental breakfasts, of the camera and the tour bus – you know who you are (an unadventurous American tourist, of no

consequence to the world), where you are (Kensington Gardens, Hyde Park, London, England), and what is going on in the world beyond (bad news: World War III is about to break out). Also, nobody knows where you've gone. In style, the opening of 'Trinity' is escapism from a disastrous world out of control, and notice the way the first paragraph is in tense, blunt, headline-like sentences, whereas the second is much more relaxed. For a second example, 'Ballyhoo':

> As you trudge along in the wake of the outflowing crowd, you thumb through your memories of this evening. Your experience of the circus, with its ballyhooed promises of wonderment and its ultimate disappointment, has been to sink your teeth into a candy apple whose fruit is rotten.
> Never mind the outrageous prices, the Mt. Everest vantage point, the communistically long lines, the audience more savage than the lion act. And it wasn't the shabbiness of the performances themselves that's got you soured on Spangleland. No, instead it's that the circus is a reminder of your own secret irrational desire to steal the spotlight, to defy death, and to bask in the thunder of applause.

Many players will have no desire for any of that: but then the narrator is not talking about the player, only the protagonist.

△ More detailed briefing information, if it is needed at all, can be placed interactively into the game – and not necessarily made available all at once: see the books in the library of 'Christminster' (Gareth Rees, 1995).

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3. Player and narrator. The narrator chooses how much to tell the player and which scenes to show instead. When the game lapses into a cut-scene, a passage of text in which something happens which the player cannot interact with, it is because the narrator has chosen to override the player. Gareth Rees (Usenet posting 8/8/95):

> I decided not to use this technique, partly because I think it's an admission of defeat, a statement that the medium of adventure games is too inflexible to write the kind of character interaction we want to.

Cut-scenes risk dislocating the player's engagement with the game, and the level of trust between player and narrator. By the end of a successful game, the narrator can take greater risks, taking advantage of friendship so to speak. At the start, and especially in the overture text, the narrator does well to avoid cut-scenes and presumptions. Thomas Nilsson advises designers to

> Create an image of him or it [the narrator] and stick to it. Receiving comments about your (limited) progress in the game might be funny, as long as they are not out of character.

Indeed many narrators are self-effacing and unintrusive so long as the player pursues the "correct" line of choices, but immediately emerge as wry, sardonic or knowing once this line is deviated from. The tiniest phrases betray this:

> >wave
> You wave, but nobody waves back. Life's like that.
>
> >look behind hanging
> Nope, no more keys.
>
> You are falling towards the ground, wind whipping around you.
> >east
> Down seems more likely.
>
> Austin, your incorrigible ginger cat, lounges around here.
> >austin, go south
> I can see you've never had a cat.

'Kingdom of Hamil'; 'Sorcerer'; 'Spellbreaker'; 'Curses'. It is no coincidence that these responses are often jibes at the player's progress. Like the player, but unlike every character in the game (including the protagonist), the narrator knows that it *is* a game: it's the narrator who announces the rules, awards points and offers clues. The un-mimetic passage from 'The Hitchhiker's Guide To The Galaxy' quoted in the previous section...

> Ford lowers his voice to a whisper. "I'm not supposed to tell you this, but you'll never be able to finish the game without consulting the Guide about lots of stuff."

... is funny (if it is) because Ford is usurping the narrator. Nobody would turn a hair at the more conventional alternative:

> Ford hands over the book and turns away.
> [Please type "consult guide about stuff" to look up its entry on "stuff", and so on.]

Indeed in some games it might be said that the parser, who asks questions like "Which do you mean...?" and in some games speaks only in square brackets, is a fourth character, quite different from the narrator.

Playing games with the narrator is one of Steve Meretzky's favourite comic techniques. Here is a more moderate, more typical example:

> (It's no wonder this section of Mars is considered the Ruined Castle Capital of the Solar System.)

More moderate, yet even in 'Leather Goddesses of Phobos' such a remark feels the need for parentheses. It is only in parody that the narrator goes in for commentary full-time.

△ This is a common tactic for designers of juvenile or silly games, who hope thereby to suggest that because the game is knowing about its shortcomings it is therefore more sophisticated, more mature. But it seldom is. Cf. the numerous 'Zork' pastiches which were intended to be parodies, or Big Al's 'BJ Drifter' (1998).

• **REFERENCES**

For surveys of the quite extensive range of approaches to player identity in the canonical games, see 'Character Gender in Interactive Fiction', parts I and II, by Doug Anderson (*XYZZYnews* 3 and 6) and 'Player Character Identity in IF', John Wood (*XYZZYnews* 9). Notable gender ambiguities include the 'Snowball' trilogy, whose protagonist is one Kim Kimberley, and 'Jigsaw', which attempts a romantic sub-plot without specified genders on either part. •In later life, W. H. Auden (1907–73) considered the ghostly identity narrating a poem to be one of its two gifts to the reader: '"The first question [the reader asks] is technical: 'Here is a verbal contraption. How does it work?' The second is, in the broadest sense, moral: 'What kind of guy inhabits this poem?' "

§49 Structure

Games from all of the major design houses of the 1980s share a common structure, partly because they were planned as if they were Hollywood films, which even today retain the shape of a three-act play from nineteenth-century theatre. Designers would begin by making a formal pitch, writing two or three-page synopses of the action, and serious coding did not begin until such a synopsis had been talked through. Structural breakdowns of what they produced are often revealing.

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Size and density. There was a time when the sole measure of quality in advertisements for cheaper adventure games was the number of rooms. Level 9's most original work, 'Snowball', claimed to have over 7,000 locations, of which 6,800 made up an unusually wearisome maze. Even a 200-room game meant only minimal room descriptions and simple puzzles, scattered thinly over the map. Whereas ten of the Infocom games have fewer than sixty rooms, with 'Seastalker' (30 rooms), 'The Witness' (30) and 'The Hitchhiker's Guide To The Galaxy' (31) the most geographically concise. Today's custom is that, barring a few junctions and corridors, there should be something interactive in every room.

Today's design systems impose few restrictions on game size or construction, but designers still have an unconscious idea of a ''budget'' for a game design, if only to keep its proportions in balance. A typical medium-to-large game contains 250 objects, counting items, rooms and other sundries (the player, the compass directions) as objects. Many items are not portable but are instead walls, tapestries, thrones, control panels, coal-grinding machines and, as a rule of thumb, three items to one room is about right. We might therefore expect 60 rooms, and the next step in budgeting would be to share these out among game regions. The 180 or so items might divide as 50 portable items and 130 furnishings. ('Wishbringer': 250 objects, 52 rooms, 34 takeable items.) As for the text, 'Enchanter' contains 20,100 words, 'Trinity' 32,200 and 'Curses' 44,000, but the latter are large games and 25,000 words is more typical: around a quarter of the length of a typical novel, for an average of only 400 words per location. The size of the source code varies dramatically with the design system, but for instance: 'Spellbreaker' 17,800 lines, 'Christminster' 13,000, 'Once and Future' (Gerry Kevin Wilson, 1998) 35,000.

Limitations can be a blessing in disguise, because they force a designer to keep asking if this part or that part is altogether necessary. Here is Brian Moriarty, whose research went as far as looking up geological surveys:

> The first thing I did was sit down and make a map of the Trinity site. It was changed about 50 times trying to simplify it and get it down from over 100 rooms to the 40 or so rooms that now comprise it. It was a lot more accurate and very detailed, but a lot of that detail was totally useless.

This reduction to 40 rooms would have been worthwhile even if memory and disc space had been unlimited. Redundant locations can be an indication of too much prose and too little interaction. 'The Light: Shelby's Addendum' (C. A. McCarthy, 1995) contains much that is praiseworthy but its reviewers took a dim view of its having over twenty locations in which nothing happens.

△ It is not always realised how technical constraints have influenced the literary style of the classic games, and so of what we consider to be good today. Infocom's writers were mostly working under an absolute ceiling of 255 objects (including rooms) and memory was more pressing still. Lebling summarised the implementor's frustration *en passant* in a 1987 memo: "I made a pitch for a more-unlimited game system... Brian [Moriarty] is already running out of table space in his game, Amy [Briggs]'s game is too big and not even in Beta yet, all our EZIP games have had to be cut, and 'Bureaucracy' [Douglas Adams, 1987] had to become EZIP instead of LZIP." (We would now call both EZIP and LZIP version 4 of the Z-machine, but LZIP games were small enough to run on a Commodore 64 – the biggest source of sales – and EZIPs weren't.) Lebling lamented in 1998 that "a lot of lovely shivers" had to be cut out of his almost-finished 'The Lurking Horror' as a result: whereas in spite of the amount of her game ('Plundered Hearts') that ended on the cutting-room floor, Amy Briggs felt that "The constraints of running on the Commodore 64 helped the games be richer, I believe, than if we had been writing then for the Pentium Pro" (*XYZZYnews* 12). Similarly, Scott Adams's games, running on smaller computers with tape decks instead of disc drives, were obliged to show extreme economy with objects and textual messages, but coded rules and what we would now call daemons so efficiently that these few objects ended up tightly interlinked, with side effects and multiple uses.

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The prologue. Most games divide into three phases: prologue, middle game and end game. These phases are often closed off from each other, so that once a phase has ended it cannot be returned to, though the prologue sometimes offers premonitions of the end, or conversely the end game echoes back to the prologue. Like the children in C. S. Lewis's tales of Narnia, the player is always going "further up, and further in". Stu Galley, in debugging the mystery 'The Witness', found himself obliged to enforce the plotting of the passage between prologue and middle game:

> [The play-testers] discovered significant "branches" in the story that I had overlooked. For example, what if the player sneaks into the house or doesn't go in at all until too late? The first possibility raised too many complications, so we decided to lock all the outside doors.

The duties of the prologue are to establish an atmosphere, to foreshadow what is to come and give out a little background information, while giving the player enough entertainment to want to continue. The interactive aspect of this is that the player has to pick up the game's special skills, using commands, tools or actions special to the setting. (The prologue to 'The Meteor, The Stone and a Long Glass of Sherbet' (Angela M. Horns, 1997) uses an easy puzzle involving a telescope and a guide book to provide practice with them.)

The task of passing into the middle game should be reasonably straightforward, but at the same time involved enough that the player has a feeling that time spent on the game is time rewarded. The designer would be wise to imagine that the player of the prologue is really only toying with the game at this stage, and isn't drawing a map or being at all careful. If the prologue is too big, the player will quickly get lost and give up. If it is too hard, then many players simply won't reach the middle game.

△ The passage from the prologue to the middle game is often also the passage from the mundane to the fantastical, so that the prologue answers the question "How did I get into all this?" The prologue of 'Advent' is an above-ground landscape, whose presence lends a much greater sense of claustrophobia and depth to the underground bulk of the game. On the other hand, a few games drop the player right in at the deep end, as in 'Plundered Hearts', which opens to a sea battle in full swing.

△ Notable prologues include the streets and meadows outside the apparently impenetrable 'Christminster' college (4 locations), the undemolished planet Earth of 'The Hitchhiker's Guide To The Galaxy' (6) or 221B Baker Street in 'Sherlock' (again, 6), but some have been as large as the guild house of 'Sorcerer' (Steve Meretzky, 1984), at 13 locations, or the seaport of 'Crobe' (Jonathan Partington, 1986), at 18. 'Advent' in its classical form had an 8-location prologue, but some extensions (such as Level 9's) fleshed out the above-ground substantially, making the volcano visible as a precursor to its underground discovery late in the middle game.

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The middle game. The middle game is the one which least needs detailed planning in advance, because it is the one which comes nearest to being a miscellaneous collection of puzzles. On the other hand, since it is also the largest part it is the most in need of some rough subdivision into segments. Working through these segments, one by one, provides a sequence of problems and rewards for the player. A first-draft design of the middle game may just

consist of a rough sketch of these segments, with some general ideas for objects, places and characters. Slotting actual puzzles in can come later in a more improvisatory, freewheeling sort of way.

The obvious way to subdivide is to carve up the map, perhaps with a pattern to the regions, perhaps even sharing regions out to different authors (as in the AGT game, 'Shades of Gray', 1993). Regions correspond perhaps to time zones, to the four winds or the twelve signs of the Zodiac, or else are delineated from each other through simple geography: cave games are especially prone to this, often having a node-like room with exits in all eight cardinal directions. Thus 'Zork II' (Marc Blank and Dave Lebling, 1981) has seven areas arranged at compass points around the Carousel Room, with the area northeast serving as prologue. Sometimes the same locale occurs more than once, revisited with a different perspective. The innovative 'Spider and Web' (Andrew Plotkin, 1998), in which a player is being interrogated about what really happened when a secret installation was broken into, features repeated but varying hypothetical versions set in the same locations.

Other designers structure the game around performances: in 'Ballyhoo' the player enacts the full repertoire of circus skills, and in a region of 'The Quest for the Sangraal' all seven deadly sins must be committed. More often, though, dramatic actions are intended to become the turning points in a story. Gareth Rees (in *XYZZYnews* 6):

> In 'Christminster', I identified a set of key scenes each of which was an event or experience that affected the player character, and moved the story forwards towards the conclusion, and yet could plausibly be implemented as a section of an adventure game.

In chronological terms, the plot literally moved forwards: the clock, in 'Christminster', chimes the half-hour when a key event takes place, advancing towards dinner in hall, but time hangs heavy in an endless Cambridge afternoon while the player is stuck. Puzzles were slotted in later, often around the needs of the plot. One of the game's most enjoyable sequences, with the player exploring a pitch-dark secret tunnel in the company of Professor Wilderspin, in fact exists only to oblige the player to spend time in the Professor's company so that he can do a good deal of talking. Like most traditional interactive fiction, 'Christminster' has a plot with little overall variation except for the order in which the player does things. But some radical designers see events not as milestones but forks in the plot. Thomas M. Disch:

> . . . any computer-interactive text deconstructs itself as you write because it's always stopping and starting and branching off this way and that . . . With 'Amnesia', I found myself working with a form that allowed me to display these erasures, these unfollowed paths.

There are games, though, in which an entirely improvised middle game is compensated for by a tautly controlled prologue and end game. Andrew Plotkin (in *XYZZYnews* 14):

> Since 'So Far' [1996] is pretty much pure surrealism, I didn't *have* a plot in mind originally. I had a theme, and was co-inventing puzzles and scenes and events all at the same time.

This sounds potentially shambolic, but in an interview (*XYZZYnews* 13) in the immediate aftermath of testing 'So Far', Michael Kinyon found it enormously affecting. Steve Meretzky:

> Sometimes you have only a sketchy outline and are just beginning to coalesce the geography. Sometimes the geography coalesces around the puzzles. Sometimes it's both together.

Geography coalescing around puzzles is evident in Meretzky's work, in which events often spread across multiple locations, as in the case of the 'Sorcerer' flume ride.

△ The middle game is likely to have the largest area of playable map that the player will face. In laying this out, it adds to the interest to make connections in the half-cardinal compass directions – northeast, northwest, southeast, southwest – and to steer away from a feeling that the game has a square grid. (One of the few defects of the 'Trinity' middle game, though possibly that was the price to be paid for one of its better puzzles.) Equally, a few, possibly long, loops which can be walked around reduce retracing of steps and avoid the appearance of a bus service map in which half a dozen lines have only one exchange.

△ The passage from middle game to end game often takes the form of a scavenger hunt: throughout the middle game a number of well-hidden objects are collected and only when they are combined can the end game be entered. See 'Lords of Time' (Sue Gazzard, 1983) or indeed almost any game produced in the wake of 'Advent', as it was almost taken for granted that any game must have ''treasures''. Soon enough it became a cliché, and one which games like 'Leather Goddesses of Phobos' or 'Hollywood Hijinx' (''Hollywood'' Dave Anderson and Liz Cyr-Jones, 1986) send up, but it's still not a bad idea, because it enables many different problems to be open at once. You can be stuck finding sprocket 2 and go and work on finding sprocket 5 for a while instead.

. . . . .

End game. End games serve two purposes. First, they give the player a sense of being near to success (they used to be called the ''Master Game''), and can be used to culminate the plot, to reveal the game's secrets. They also serve to stop the final stage of the game from being too hard to play, narrowing it to only a few accessible rooms or objects. In cave games like 'Zork', the final puzzle would be made exceptionally difficult but today's designers

usually prefer to give the player the satisfaction of finishing, and themselves the satisfaction of knowing that their story has been completed.

A mark of the last pieces of the puzzle falling into place is that loose ends are tied neatly up and the characters sent away with their fates worked out and futures settled. Looking back, from the point of view of a winning player, can you understand what has happened and why? Can you also see what is to happen to the protagonist next?

The final message is another important one and, as with the overture, the coda is all the better for being brief. To quote examples would only spoil their games. A popular device is to make the two scenes which open and close the story ''book-ends'' for each other, symmetrical and matching.

△ To speak of ''the'' final message or ''the'' last step is a little presumptive. Multiple outcomes are not to every designer's taste, but Daniel Ravipinto's 'Tapestry' (1996), with its sense of tragedy, and its misleading portents and advice, drew much of its strength from an open end. (Its plot owes much to the 1993 *Star Trek: The Next Generation* episode of the same name.)

△ Gerry Kevin Wilson suggests that the end game should feature ''your Big Nasty™. The Big Nasty™ is the final challenge, be it monster, man, maze, or whatever. This is where you want to ham up your writing and get a sense of urgency going. There needs to be a time limit . . .'' In this view, which is not universally shared, the end game is like a video game's ''Boss Level''.

△ Like prologues, end games vary in size: from a one or two location single closing scene ('The Lurking Horror', 'Sorcerer') to a new game region (the Dungeon Master's lair in 'Zork III' (Marc Blank and Dave Lebling, 1982), 7 locations, or Roman Britain in 'Curses', 16).

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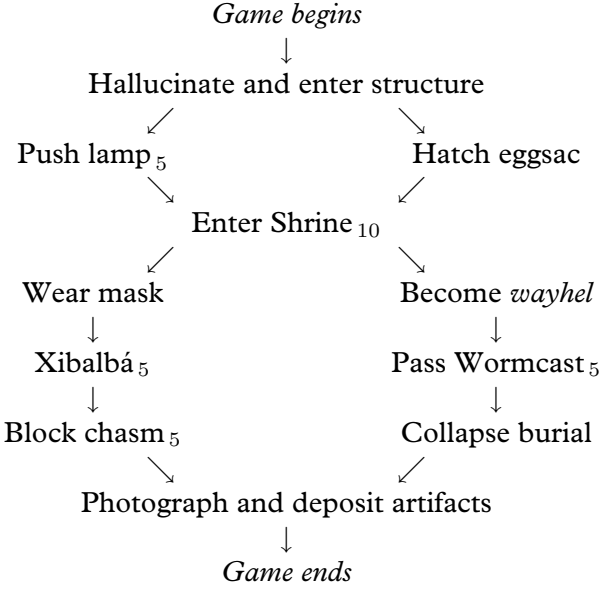
Games in the style of 'Advent' are very wide, with around thirty or so puzzles, all easily available and soluble in any order. Others, such as the Melbourne House adaptation of Tolkien ('Lord of the Rings Game One' (later a.k.a. 'The Fellowship of the Ring'), 'Shadows of Mordor', 'The Crack of Doom', Philip Mitchell, 1985, 1987, 1989), are very narrow: a long sequence of puzzles, each of which leads only to a chance to solve the next. Wide games are dull, since no problem solved will lead to any radical change. Narrow games are difficult to pitch: if the one puzzle open at a time is easy then play is too rapid, but if it is hard then the player will be abruptly slammed into a wall of frustration.

Towards the end of design it can be helpful to draw out a lattice diagram of the puzzles. At the top is a node representing the start of the game, and then lower nodes represent solved puzzles. An arrow is drawn between two puzzles if one has to be solved before the other can be. Here is the lattice diagram for

'Ruins', with subscripted numbers showing the points scored on reaching each given position: each of the artifacts is worth 5 except the jade mask, worth 10.



This diagram is useful for three reasons. Firstly, it checks that the game is soluble at all: for example, if the jade mask had been kept in Xibalbá, there would be no solution. Secondly, it shows how much of the game happens in different areas. Most usefully of all, the diagram shows whether the game is wide or narrow and which puzzles are likely to be bottlenecks, with large parts of the game depending on their solution. This tall, spindly diagram is indicative of a fairly linear plot, not surprisingly as the game is so small. The problem of entering the Shrine is evidently a bottleneck.

△ A long arrow on a lattice diagram is a caution that some action very early in play is essential even though it has no effect until some other action much later on. If the early action becomes impossible later, for instance because it is in a prologue which cannot be returned to, the player will legitimately feel aggrieved. In 'Christminster', "getting invited to dinner" is theoretically an early puzzle because access to the Master's lodgings occurs at the outset of the middle game, but the puzzle never goes away and remains accessible right up to dinner time.

• **REFERENCES**

C. E. Forman exhibits the lattice diagram for 'Enchanter', which clearly shows its prologue, middle game, end game structure, in *XYZZYnews* 4. Replying in issue 6, Gareth Rees argues that game analysis is an aid to, rather than an integral part of, game design.

§50 The design of puzzles

> The odyssey of 'Zork: Mimesis' begins in a field behind a white house. You climb in through an open window, take the water and sack lunch from the table, go in the living room and move the rug aside to reveal – a blank floor! ... Soon the owner of the house – an underemployed, alcoholic bricklayer – is covering you with a shotgun as his unfaithful, neurotic wife dials 911. The puzzle-free, super-literary action continues as you are funneled through the criminal justice system...
>
> — Roger Giner-Sorolla, conceding that mimesis is not everything

Without puzzles, or problems, or mechanisms to allow the player to receive the text a little at a time – whichever phrase you prefer – there is no interaction. Inevitably, puzzles are obstacles. Here, Arthur Dent will not be able to meet aliens and have a generally wild time until he has got hold of a babel fish:

```
>examine machine
```
The dispenser is tall, has a button at around eye-level, and says ''Babel Fish'' in large letters. Anything dispensed would probably come out the slot at around knee-level. It bears a small label which reads ''Another fine product of the Sirius Cybernetics Corporation.''
```
>press dispenser button
```
A single babel fish shoots out of the slot. It sails across the room and through a small hole in the wall, just under a metal hook.
```
>remove dressing gown
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Okay, you're no longer wearing your gown.
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>hang gown on hook
```
The gown is now hanging from the hook, covering a tiny hole.
```
>push dispenser button
```
A single babel fish shoots out of the slot. It sails across the room and hits the dressing gown. The fish slides down the sleeve of the gown and falls to the floor, vanishing through the grating of a hitherto unnoticed drain.
```
>put towel over drain
```
The towel completely covers the drain.

(For the final solution, still some way off, see 'The Hitchhiker's Guide To The Galaxy'.) A good game mixes easy puzzles with hard, but no puzzle should be so simple that one obvious command solves it. On the other hand nor should its solution, once guessed, take ridiculously long to achieve, or require endless repetition: such as to fetch something pointlessly distant, or to solve

an eight-discs Tower of Hanoi, or to keep juggling objects so that only three are carried at any one time. Here are two basic pitfalls:

The ''Get–X–Use–X'' syndrome. By convention, every word or phrase in a cryptic crossword clue is used exactly once to account for some part of the answer. The equivalent in adventure games is the equation ''one object = one puzzle solved'', where the player picks up a bicycle pump and looks for a bicycle, picks up a pin and looks for a balloon, and so on. Once used, an object can be dropped, for it surely will not be needed again. But this convention rapidly drains away realism, and most designers try to break the equation in every way possible: with red herrings (one object = no solutions), collection puzzles (many objects = one solution), multiple solutions (any of several objects = one solution) and multiple usages (one object = many solutions).

The ''What's-the-Verb'' syndrome. In 'Ballyhoo', ''whip lion'' and ''hit lion with whip'' are inequivalent and only one of them does any taming. The following, from 'Sorcerer', can only be called a bug:

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>unlock journal
(with the small key)
No spell would help with that!
>open journal
(with the small key)
The journal springs open.
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(For a third example, the wording needed to use the brick in 'Zork II' is most unfair.) In many games the ''examine'', ''search'' and ''look inside'' verbs all perform different actions, and it is easy to accidentally design a hidden treasure in such a way that only one of these will find it. (Though at the other extreme, excessive tolerance for verbs leads to everything being ''moved'', not ''pushed'', ''pulled'' or ''rotated''.) Similarly, in the *''What's-the-Noun'' syndrome*, an object stubbornly fails to respond to reasonable synonyms, such as ''sword'' for ''gladius'' or ''football'' for a soccer ball. But perhaps a remark on a sad subject might be intruded here. The Japanese woman near the start of 'Trinity' can be called ''yellow'' and ''Jap'', terms with a grisly resonance. The game shows nothing but respect for her: should it allow the player to do otherwise?

Variety is valuable, but logic and fairness are paramount. ''Is the writer pulling a rabbit out of a hat or do you see the fuzzy ears first?'' (Dave Lebling). Gareth Rees suggests that one way to ensure that puzzles are consistent with the game containing them is to write a sample transcript of play first:

> It stops me coding anything until I have a puzzle fairly well fleshed out in my mind. Too often it's tempting to start coding something one way and then discover that later developments need a different approach.
> It makes me think like a player (I try to ... include a selection of the silly things that I would be liable to type if I were playing the game ...). Often when coding it becomes habit just to fail to deal with situations and responses that are tricky to write. Having them appear on the script forces me to say to myself, 'It may be tough to code but it'll appear natural in the game and that's worth it'. I also find it hard to get into the habit of providing interesting responses to failed actions, and the script helps with this.

Another approach is to chain backwards from a goal, repeatedly asking "how can I obstruct this further?", so that the plot line becomes, like a computer drawing of a fractal curve, more crinkly with each iteration. Peter Killworth, in his book *How to Write Adventure Games for the BBC Microcomputer Model B and Acorn Electron* (whose opening words are "Adventure games are like avocado pears") describes an entire game this way ('Roman', 1984). Thus you need to pay a debt to a Senator, so you need to steal a bust from a temple, but that means impersonating a priest, by sacrificing a chicken with a gladius, which means catching a chicken (you scare it with a cat, but the cat must be attracted by a mouse, which you need to catch with a mousetrap): and the gladius isn't just lying around, either. You also need a torch, which

> ... needs soaking in oil first, just as candles need wax to burn. So we'd better organise a pool of oil through which the player can walk ... When the player gets to a source of flame – how about a brazier of coals, which will have to be untakeable? – he can attempt to light his torch. It isn't oily, it burns to a stump well-nigh instantly ... If it is oily, it'll catch fire ... No, that's too simple. If a player is soaked in oil too, he'll probably catch fire too! ... We'll create a damp, misty area, where the player is assassinated by a runaway slave, unless he enters while on fire. Then he will be safe, because the mist will condense on his body ... So the poor player, staggering around and on fire, will try the mist, but to his disappointment the torch will go out permanently too! The solution is trivial – he must drop the torch before entering the mist.

(Killworth's games are not known for their qualms and the player, it will be noted, forfeits the game without any warning by lighting the unoily torch or exploring the misty area.) This kind of plotting, with puzzles strung together like beads onto a necklace, offers the considerable advantage of lending coherency. But it is also liable to make long, linear sequences of puzzles which must be completed in an exact order. "I've found it incredibly hard to keep the puzzles from leading the whole story" (David M. Baggett, 1994).

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Mazes. In the *Traité des systèmes* of 1749, Condillac wrote: "What could be more ridiculous than that men awakening from a profound sleep, and finding themselves in the middle of a labyrinth, should lay down general principles for discovering the way out?" Ridiculous, but very human, because the dogged exploration of a maze is dull indeed, repetitious and irritatingly drawn-out: far more enjoyment is to be found in the working-out of its general principles.

Be it clearly said: it is designers who like mazes ("Concocting such mazes is one of my delights" – Peter Killworth); players do *not* like mazes. In the original puzzle, a tangled set of rooms have indistinguishable descriptions so that mapping becomes impossible: the original solution is to make the rooms distinguishable again by littering them with objects as markers. This solution is easily obstructed (the 'Advent' pirate and the 'Zork I' thief wander around picking the objects up again), but this only makes the experience more tiresome. When David Baggett was asked "How do I make my maze so that it doesn't have the standard solution?", his entire reply was: "Omit it."

Nevertheless, like the writing of locked-room mysteries, the devising of new solutions for mazes – usually involving guides, or hidden signs, or ways to see – is a modest art form in its own right: novelty being the essential point, though it is equally important to signal to the player that a novel solution exists. The unique *The Adventure Gamer's Manual* (1992), by the Cornish vicar and eccentric writer Bob Redrup, devotes all of Chapters 7 and 8 to solving maze variants: a faintly weary tone is maintained throughout. Redrup was an aficionado of the Topologika, and thus of the formerly Cambridge University games, which are simply riddled with mazes. Here, in 'Crobe' (1986) by the indefatigable maze-maker Jonathan Partington, the player is evidently not expected to explore haphazardly:

> You are in an underground marsh, a treacherous place where everything looks alike and water and slime lap around your feet. One false move would mean death, but you do at least have the choice of 8 horizontal directions to wander in.

Because lethal unless solved utterly, this is a benign sort of maze. Likewise, in 'Kingdom of Hamil' (1982):

> You are in the Maze of Hamil. Light streams in through many gaps in the rocks. There is the constant sound of rockfalls, distant and not-so-distant.
> There is a small nickel hexagon here, with the inscription "1 PFENTIME".

Whatever is going on here, it doesn't look like a simple matter of dropping marker-objects. Partington also has a (thoroughly unfashionable) penchant for elements of randomness which a player can overcome with great difficulty by careful planning. The caryatid maze from 'Fyleet' (1985) makes the novel twist of imposing random obstacles on a determined layout, and in 'The Quest

for the Sangraal' (1987): ''There are exits in various directions, but, since the island is rotating, these directions change continually.'' Infocom's output has its share of mazes, too, one per game: those in 'Starcross' and the 'Enchanter', 'Sorcerer', 'Spellbreaker' trilogy are the most satisfying.

Light source puzzles. Almost as disliked, but offering a little more scope to the designer, is the ''bringing light to darkness'' puzzle. The two standards reduce to refilling a lamp with limited oil and bringing light to a dark room which can apparently only be reached by a player who *hasn't* got a light source. ('Advent' includes both. The lake and aqueduct areas of 'Zork III' have an elegant light puzzle, probably the best thing in an otherwise so-so game.) Darkness need not be a problem to be solved, though: it might be a fact of life. Though few games have tried this (but visit the secret passage in 'Christminster'), a large permanently dark area might still be explored with the other senses.

Capacity and exhaustion puzzles. Again, unpopular because their solution is normally tiresomely repetitive, forcing the player to keep putting things down and picking them up again. It can seem ridiculous that the protagonist can carry hundreds of bulky and fiddly things around all the time, so many designers impose a limit for realism's sake, typically of seven objects. It is bad form to set puzzles making life difficult because the limit is four and not five (after all, in emergency anyone can always carry one more item). In some games the limit is instead on total weight. Taking realism further, some games measure a state of health or even numerical levels of ''strength'' and ''constitution'' during play. The protagonist grows hungry and needs food, tired and needs sleep (in 'Enchanter' he is positively narcoleptic), wounded and needs recuperation. 'Planetfall' simulated a progressive illness whose symptoms are increasing need for food and sleep, and put many players off this kind of puzzle for life. Exhaustion rules are difficult to make fair. A rule requiring a return to an orchard for fruit should be watched carefully, as it will irritate a player to have to do this for a second, a third or a tenth time.

Timed puzzles. Completing this round-up of unpopular but still sometimes justified puzzles are those which involve timed events, running along a script which requires the player to do something specific at one particular moment. In the prologue to 'The Hitchhiker's Guide To The Galaxy', why would any player buy the cheese sandwich in the pub and then feed it to the dog in the lane, on the one and only turn in which this is possible? Admittedly, an alternative exists later on, but this is not evident at the time. Mike Roberts (Usenet posting, 1999):

> Aside from the annoyance, the reason I try to avoid timed puzzles is that they make you acutely aware that you're playing a game. As soon as I get into a save-try-restore loop, any sense of immersion is destroyed for me; I instead feel like I'm debugging a program, since I'm running through a series of inputs to figure out how the game responds.

This "sense of immersion" can partly be restored by keying events not to game turns but to the time of day, provided this fits the scenario, and making each stage last for a great many more turns than are strictly needed to solve the puzzles. Events which come only to he who waits are also problematic. In the Land of Shadow of 'Zork III', only the player who decides for some reason to wait on a fairly uninteresting Ledge will be rewarded with a visitor. (This case is defensible on grounds of context, but only just.)

Utility objects. A designer who wants players to think of some items as useful needs to provide many situations – more than one, anyway – in which they can be used. A hallmark of better-designed games is that the player accumulates a few useful tools during play and wants to keep them to hand thereafter. (Cf. the crowbar and gloves in 'The Lurking Horror'.)

Keys and doors. Almost all games close off segments of the map on a temporary basis by putting them behind locked doors. Many variations on this theme are extant in the literature: coded messages on the door, illusory defences, gate-keepers, the key being in the lock on the wrong side and so on. More usually a locked door signals to the player that a different puzzle (i.e., finding the key) has to be solved before this one can be, so that a designer uses it to impose a chronology on events. Questions to ask here include: if there are people just inside, do they react when the protagonist knocks on the door, or tries to break it down or ram it? Can the door be opened, closed, locked or unlocked from both sides? Are there skeleton or master-keys capable of opening many different doors? Are the keys which do open different doors sufficiently distinctive in appearance? Roger Giner-Sorolla commented that keys are the most naked kind of Get–X–Use–X puzzle:

> One can only find so many keys inside fishes' bellies, lost in the wainscotting, dropped at random in corridors, or hanging around guard dogs' necks before the artifice of the puzzle structure becomes painfully clear. By contrast, all six of the keys in 'Christminster' are hidden in places where one might actually keep a key, and all their locks are guarding places that one would expect to be locked; moreover, we end the game with a pretty clear idea of who normally uses each key and why.

Machinery and vehicles. Machines are among the easiest puzzles to design: they have levers or ropes to pull, switches to press, cogs to turn. They need not

make conversation or respond to anything beyond their function. They often require specialised tools, which brings in objects. They can transform the game in a semi-magical way; time travel or transforming coal to diamond being the clichés. They can also connect together different locations: chains, swinging arms and chutes may run across the map, and help to glue it together. Writing in the TADS manual, Mike Roberts makes the useful point that machines assist interactivity:

> For example, you might design a machine, described as "a small metal box with a button, a short plastic hose on one side, and a large metal pipe on the other side." When the button is pushed, "a loud hissing comes from the plastic hose for a moment, then a large drop of clear liquid drops out of the pipe, which hits the floor and quickly evaporates into a white cloud of vapor." If the player puts the plastic hose in a glass of water and the button is pushed, "the water is sucked into the plastic tube, and few moments later a block of ice is dropped out of the pipe." This allows the player to learn by experimentation what the machine does, which is more fun for the player than if you had labelled the machine "a freezer" or some such.

In machine puzzles, then, the player experiments with the controls and forms a theory of what is happening. With larger machines this involves visualising the physical construction of the components and how they affect each other: 'Hollywood Hijinx' is a tour de force of such puzzles, with a see-saw and a suspended safe. But the literature also includes highly complex self-contained machines presenting something of a black box whose internals must be deduced, such as a B-52 bomber and an Enigma cipher machine ('Jigsaw') and a computer which is programmable in the language Scheme ('Lists and Lists', Andrew Plotkin, 1996). Vehicles in games to date have included cars, tractors, fork-lift trucks, boats, hot-air balloons, log flumes, punts and elephant rides. Vehicles increase the realism of a landscape, by making it more than a set of rules about walking. They nevertheless need a little care to code: for instance, to disallow driving up ladders or through a narrow crevice.

Fire. The elements all tangle up code but add to the illusion. Fire has many useful properties – it makes light, it destroys things, it can cause explosions and chemical reactions, it cooks food, it softens materials, it can be passed from one object to another – but in the end it spreads, whereas the game's understanding doesn't. If the player is allowed to carry a naked flame, then the game is likely to need a rule to tell it whether or not every other item is flammable, and so on.

Water. In any location where water is available, players will try drinking, swimming, washing, diving. They will try to walk away with, indeed on,

the water. Liquids make poor objects, because they need to be carried in some container yet can be poured from one to another, and because they are endlessly divisible. "Some water" can easily be made into "some water" and "some water". If there's more than one liquid in the game, can they be mixed? Pouring liquid over something is likely to make a mess of it: yet why should it be impossible? And so on. The compromise solution is usually to have a bottle with a capacity of, say, 5 units of water, which can be refilled in any room where there is water and so that 1 unit is drunk at a time. The player who tries to pour water over most things is simply admonished and told not to. Implementing swimming, or being underwater, is a different order of difficulty again, and many games agree with 'Parc' (John Rennie, 1983) that "since you cannot free yourself, and since you are by nature an air-breathing mammal I'm afraid you drown!". (Level 9's game 'Adventure Quest' is rare in containing a coherently worked out underwater section, though many games have the odd turn's-worth of diving. 'Jinxter' (Georgina Sinclair and Michael Bywater, 1987), also has an elaborate underwater section, with a seldom-discovered shipwreck to boot.) What happens to objects being held? Can the protagonist swim while wearing heavy clothes, or carrying many things? Is it possible to dive?

Air. Smoke and fog can obscure the scene, but puzzles involving air are mainly about its absence. The lack of oxygen to breathe has featured in many games, not always through being underwater: 'Zork I' and 'Sorcerer' share a mine with poor air, 'Starcross' and 'Trinity' include locations in the vacuum of space. A scuba mask, space helmet or some other kind of breathing apparatus is called for. (Other gases simulated include helium, explosive hydrogen and laughing gas.) Can the protagonist speak, or eat, or listen, or taste while wearing this apparatus?

Earth. Digging for buried treasure... the shovel can be found in just about every traditional-style game and a good many others which ought to know better besides. The problem is that the player may want to dig anywhere and everywhere, which the game will probably not want to implement: to dig may artificially create a new location, or a new map connection, or a new container – the hole left in the ground, that is. (The prologue to 'Infidel', though the least interesting part of the game from the point of view of playing, has a good implementation of digging through sand.)

Plants. Vegetation fits into almost any landscape, and on the grounds of interactivity generally plays some part in the game, which is good for variety, because people deal differently with plants from machines and people. Undergrowth can be pulled away from something obscured, or useful plants picked. Trees and creeping plants ought to be climbable: players nearly always try.

Animals. In many ways preferable to people, animals add a splash of colour, and what would the Garden of Eden have been without elephants, rabbits, leopards and guinea pigs? They move and behave in curious and obsessive ways, displaying what human characteristics they like but not needing to react to conversation or to show human curiosity or surprise at what happens. This makes them much easier to design, but it doesn't exempt them from characterisation. It's a little predictable to make the player feed an animal into obedience and then get it do something. (The bird in 'Advent' is nicely characterised, in that it is frightened by the rusty iron rod with a star on one end. 'Trinity' is positively overrun with animal life, with some critics having called its roadrunner the most important character.)

Monsters. Many of the early adventure games included trolls, orcs and dragons, or else Frankenstein's Monster, Dracula and vampire bats: some, like 'Zork I', allow hack-and-slay combat in the style of a role-playing game like *Dungeons and Dragons*. Others, like the heavily infested and therefore somewhat repetitive 'Murdac' (Jonathan Partington, 1982), base all their puzzles on getting past or getting rid of things. ''Getting past'' occurs often because most monster puzzles are no more than doors with the decoration of slavering fangs. Even when monsters wander, they are generally dull because – being monsters – they have no unpredictable behaviour. Whereas the capacious underworld of the same author's 'Kingdom of Hamil' houses a baby hexapod (a what?) and a Conan Doyle-like Lost World of dinosaurs, which is much more the thing.

People. So dawns the sixth day of creation: we have the mountains, rivers, plants and animals, but as yet no people. The nightmare of coding real characters is illustrated well by one of Dave Lebling's example bugs from 'Suspect' (1984):

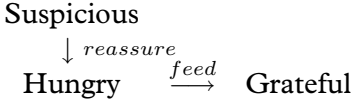
```
>show corpse to michael
Michael doesn't appear interested.
```

The body is that of Veronica, Michael's wife. Objects representing people often take extensive code, perhaps five times that needed for even a complicated room, because they may need to react to events, follow instructions (''robot, go

south''), wander around the map and make conversation of sorts (the woman selling bread-crumbs in 'Trinity', who plays only a minor role, can say over 50 different things). Games with strongly-defined protagonists tend to have a stronger supporting cast, too:

> 'Christminster' does an exceptionally good job of outlining Christabel's role as a woman by limiting her actions (she can't enter chapel bareheaded) and through ... dialogue (the villains and the Master are condescending, while young Edward sees her as a confidante).

(Roger Giner-Sorolla.) What distinguishes a character from, say, a spanner is that it has an attitude to the protagonist. One model of this has the current attitude as a position in a ''mood maze'', with different moods being like locations and stimuli applied by the protagonist being like directions:



(Setting out in the ''feed'' direction from Suspicious leads nowhere, as the food is not accepted.) Such a person is no more than a plaything, entirely reactive and without memory, so most designers would want to conceal this fact by adding spontaneous or even random behaviour, startling the player from time to time. Or, of course, by simulating some memory of events. Adam Cadre's 'Varicella' (1999) handles conversation using around 450 flag variables to remember which questions have been asked and answered before. It also reformulates conversation. Here, the protagonist Varicella – as bad as the rest of them, Cadre having a rare gift for the amoral – encounters Miss Sierra, the King's mistress:

> `>ask sierra about king`
> ''What can you tell me about the King?'' you ask. ''You seem to have known him better than anyone else...''
> Miss Sierra scowls at you. ''That had better not be an attempt at a personal question,'' she says. ''If you're expecting a rhapsody about how he won my girlish heart, think again. ...''
> `>ask sierra about king`
> ''Is there anything else you care to say about the King?'' you ask.

Elsewhere, ''ask guard about rico'' can come out as ''Is Rico in?'', ''ask queen about prince'' as ''How is Prince Charles?'' and so on according to what would make sense in context. Such programming is exhausting but fruitful in a game placing great reliance on conversation.

Ropes and chains. Are notoriously troublesome to implement consistently:

> [Someone will] say "Well, I've got this rope... how do I do a rope? It can be in two rooms at once if you tie it to something and take the end with you, and can you tie things up with it and drag them around with you?"
> Then we'll stop and think and say, "You don't want to have a rope in your game," and that makes it much easier for the new writers, you see.
> My new game ['The Lurking Horror'] has a chain in it, and it's even worse than a rope in almost every respect you can imagine and it's caused me no end of horror... the number of bugs that have come in on this chain alone would stack from here to there and back again.

(Dave Lebling again. But the chain puzzle in 'Lurking' is a masterstroke.) 'The Meteor, The Stone and a Long Glass of Sherbet' has a rope solving several puzzles whose source code runs to 300 lines of Inform, which is more than the whole "lily pond" region took: put another way, 5% of the entire code is occupied describing the rope. There is also a long ladder which is nearly as bad, and which the player is *not* allowed to tie the rope to.

Riddles. Numerous games ('Beyond Zork', 'The Path to Fortune' (Jeff Cassidy and C. E. Forman, 1995)) include sphinxes or talking doors which pose riddles to passing strangers, and the writing of good riddles is an art form in itself. But who put these puzzle-obsessed doorkeepers there, and why? The knock-knock joke door in Irene Callaci's 'Mother Loose' (1998) sits much more happily, as the game is a wry mingling of nursery-rhyme stories for her six-year-old granddaughter (and indeed for the rest of us).

Decipherment. Perhaps the most abstract and, if done well, the most satisfying of puzzles are those which present a system of coded messages, clues to the meaning of which are scattered across the game. 'Infidel' has hieroglyphics. 'Edifice' (Lucian Smith, 1997) requires the player to learn the language of Nalian, a puzzle which won considerable plaudits from players. But there are non-linguistic decipherments, too: in a sense the map of 'Spellbreaker' is itself a cipher. On a smaller scale, several Cambridge University games contain tricky cipher puzzles not unrelated to recreational mathematics. 'Avon', for instance, has a substitution code which is insoluble, but which it is possible to make partial deductions about: just enough to solve the problem at hand.

. . . . .

Clues. At least in one view of interactive fiction, clues are essential and the principle should be that an ideally perceptive player could win on his or her first attempt, without recourse to saved games: in particular, without knowledge of past lives or of future events. (The exact opposite, in fact, of what 'Brand

X' does. The player begins in a shop containing an aqualung, a cushion, a bunch of keys, a piece of sausage, a teabag and a sign declaring that "only two implements may be removed from this shop under penalty of death, so choose carefully".) Here are three clues which did not carry:

(1) In 'Dungeon Adventure', a pride of lions is carved over a doorway. Any player walking through falls into a lethal pit. Did you miss the clue?†

(2) The diamond maze in 'Zork II' is almost impossible to fathom unless (or even if) you are familiar with a certain multiple-innings team sport played only in America. In the words of even its designer: "always annoyed me... pretty lame."

(3) Almost every player of 'Advent' has considered the rock marked Y2 to be a decoy, emblematic of the mysterious cave. But it was meant as a clue: on the cave maps used by Will Crowther's group, "Y2" denoted a secondary cave entrance, which in a certain sense is what this location is.‡

(1) is a bad pun, (2) an unconscious assumption and (3) an in-joke. Games that are entirely in-jokes, like the subgenre of college campus simulations ('The Lurking Horror' features MIT, Infocom's alma mater) are at least deliberately so, but it is all too easy for designers to include familiar objects from their own lives into any game, and unconsciously assume that the player shares this familiarity. When that familiarity is needed to solve a puzzle, the game may become unplayable.

Luck and accidental solutions. Small chance variations add to the fun, but only small ones. The thief in 'Zork I' seems to me to be just about right in this respect, and similarly the spinning room in 'Zork II', but a ten-ton weight which falls down and kills the player at a certain point in half of all games would simply irritate. A particular danger occurs with low-probability events, one or a combination of which might destroy the player's chances. For instance, in the earliest edition of 'Adventureland', the bees have an 8% chance of suffocation each turn carried in the bottle: one needs to carry them for 10 or 11 turns, giving the bees only a 40% chance of surviving to their destination.

Even in a puzzle with no element of luck, many problems are solved by accident or trial and error. (The notorious Bank of Zork puzzle in 'Zork II' has been understood by almost nobody who solved it.) This is unsatisfying for

† Pride comes before a fall.

‡ Several Cambridge University games, written by mathematicians, refer to "J4": 'Acheton', for instance, has a "J4 room" rather like the "Y2 rock room". The then-recent construction of the previously only hypothetical group J_4 had completed the classification theorem for finite simple groups, and was a departmental triumph. The sign "$\exists J_4$" remained above a doorframe for some years.

both player and designer, and some games take steps to try to avoid it. The gold-assaying puzzle in 'Spellbreaker' is such that a shrewd strategy will always succeed, but in principle even a random strategy *might* succeed. The game rigs the odds to ensure that it never does.

Optional, partial and multiple solutions. Most designers like to give two or more different solutions to a few puzzles in a game: it seems more real, it means that even a winning player hasn't found all of the game's secrets and it makes a difficult puzzle easier. (There are seven ways to open the child-proof medicine bottle in 'Curses'.) Multiple solutions to the same puzzle need to be equally valid. The designer should not think of one solution as the ''real'' one, or allow another ''short cut'' one to skip critical plot events – this would short-change the player. On the other hand the designer must be relaxed about the inevitability that some part of his golden prose will never be seen whichever path the player takes. Most additional solutions are added in play-testing, but here is Brian Moriarty on 'Wishbringer' (1985):

> Most of the problems in the story have two or more solutions. The easy way out is to use Wishbringer. If a beginner gets frustrated, he can whip out the magic stone, mumble a wish and keep on playing. Experienced players can search for one of the logical solutions – a bit harder, perhaps, but more satisfying. It's possible to complete the story without using any of the stone's seven wishes. In fact, that's the only way to earn the full 100 points.
>
> The puzzles are highly interconnected. Once you start wishing your problems away, it's very hard to continue playing without relying more and more on the magic stone. The impotence of idle wishing – that's the moral of 'Wishbringer'. All really good stories have a moral.

Analogous perhaps to the Wishbringer stone, 'Enchanter' has a one-use-only anti-magic spell. Although this solves one in particular of the more difficult puzzles, to use it up so early forfeits the game, since it is needed later. If you do fall into this trap, one of the ingenious dream sequences offers an oblique warning:

> You dream of climbing in an unfamiliar place. You seem to climb forever, beyond reason. A fleeting hope arises in you, and you search furiously in your spell book and possessions for something. After a moment, you become frantic as you realize that you don't have it! You bolt awake in a cold sweat.

Rewards. What reward for solving a puzzle? One is obvious: the game state advances a little towards its completion. But the player at the keyboard needs a reward as well: that the game should offer something new to look at. The white cubes in 'Spellbreaker', with the power to teleport the protagonist to new areas, are far more alluring than, say, the ''platinum pyramid'' of 'Advent', which is only a noun with a few points attached and opens up no further map.

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"[A puzzle] should be logical, according to the logic of the game's universe. In a fantasy game, a puzzle can rely on magic, but the magic must be consistent throughout the game. A puzzle should be original in some way, not just a rehash of an earlier puzzle with different objects." (Steve Meretzky). "My basic principle of designing puzzles is that the player should always know what he's trying to accomplish. Metaphorically, a player should always be able to find a locked door before he finds the key" (Mike Roberts in the *TADS* manual). "In all cases, after a particularly arduous puzzle, reward the player with a few simpler ones" (C. E. Forman, *XYZZYnews* 1). "Err on the side of easy. (He said, waiting to be struck dead for hypocrisy.)" (Andrew Plotkin). "There's definitely a difference between 'satisfying' and 'pertinent'." (Lucian Smith. These last quotations from the round-table discussion on puzzles in *XYZZYnews* 14.) •For more on the invented language in 'Edifice', see 'Parlez-Vous Nalian' in *XYZZYnews* 16.

§51 The room description

When beginning to code a design, it is tempting to give rooms temporary descriptions (''Slab room.'' ''Cloister.''), and leave the writing for later. There is no more depressing point than facing a pile of 50 room descriptions to write, all at once, and feeling that one's enthusiasm has altogether gone. (The same applies to making an over-detailed design before doing any coding.) Besides, when testing the rooms concerned, one has no feeling of what the game will look like except tatty, and this is also depressing. Also, writing room descriptions forces the designer to think about what the room is ultimately for. So most designers like to write a few at a time, as coding goes on, but to write them properly: and edit later for consistency and second thoughts.

In any room description there are usually one to three essentials to get across, and the rest is better cut or relegated to text appearing only if the player chooses to examine something in particular. Even the most tedious junctions deserve description, however, and description is more than a list of exits. Here is 'Advent' at its most graceful:

> *Shell Room*
> You're in a large room carved out of sedimentary rock. The floor and walls are littered with bits of shells embedded in the stone. A shallow passage proceeds downward, and a somewhat steeper one leads up. A low hands and knees passage enters from the south.
> *In Limestone Passage*
> You are walking along a gently sloping north/south passage lined with oddly shaped limestone formations.

Note the geology, the slight unevenness of the ground and the variation in the size of the tunnels. Nothing happens here, but it seems a real place.

Flippant room descriptions are best avoided if they will be often revisited. Subtler humour is more durable:

> On the wall by the bed is a slightly curved, full-length mirror. You reflect upon this for a while.

(From the Cambridge University game 'Xenophobia' (Jonathan Mestel, 1989). This wording is also neat in that it applies equally well on the tenth visit to a location as on the first, whereas text like ''Astonished to see a mirror, you leap back. . .'' would not.) About once in a game an author can get away with something like this:

Observation Room

Calvin Coolidge once described windows as ''rectangles of glass.'' If so, he may have been thinking about the window which fills the western wall of this room. A tiny closet lies to the north. A sign is posted next to the stairs which lead both upwards and downwards.

A characteristic piece of Steve Meretzky† from 'Leather Goddesses of Phobos', demonstrating the lengths one has to go to when faced with a relentlessly ordinary junction-with-window. The sentence Meretzky is at pains to avoid is ''You can go up, down or north.'' With care it is even possible to remove mention of a room's exits altogether, but only if the information is presented in some other way. For instance:

Dark Cave

Little light seeps into this muddy, bone-scattered cave and always you long for fresh air. Strange bubbles, pulsing and shifting as if alive, hang upon the rock at crazy, irregular angles.

Black crabs scuttle about your feet.

`>south`

The only exit is back out north to the sea-shore.

Here, the ''You can't go that way'' message for the room has taken up the slack.

Experienced players know all of the various formulae used in room descriptions by heart: ''You're in'', ''You are in'', ''This is'', ''You have come to'' and so forth. This, perhaps, is why some designers prefer impersonal room descriptions, not mentioning ''you'' unless to say something other than the obvious fact of being present. Once into the text then, as in all writing, vocabulary counts. If there is a tree, of what species? If a chair, of what style? ('Cutthroats' (Mike Berlyn and Jerry Wolper, 1984) describes a cupboard of no particular interest as a ''lopsided wooden dresser'' for the sake of painting the scene.) Room descriptions should not always describe static, fixed things, should bring in senses other than sight and should not always be monochrome. Plainness and repetition are to be avoided at almost any cost:

You're on a winding drive outside a magnificent door. Exits are west to a woodshed, upwards to a vine and in through a door. You can see a vine.

`>west`

† But Meretzky was not always as corny as his reputation. Influenced by 'Suspended', which he had play-tested and later called ''probably the most interesting and daringly different game Infocom ever did'', he used a virtual reality theme to construct almost the only work of early IF to contain serious political themes: 'A Mind Forever Voyaging' (1985).

> You're in a woodshed in the swamp. Exits are east to a winding drive and west to a herb garden. You can see a candle and a woodpile.

('The Price of Magik', BBC Micro version – in the Amiga version of the later 'Time and Magik Trilogy' re-release, the winding drive description ran to an eighty-word essay, and did away entirely with the mechanically-generated "exits are" sentence.) So much for what is bad. The following, from 'Advent' again, is something much more dangerous: the mediocre room description.

> *Whirlpool Room*
> You are in a magnificent cavern with a rushing stream, which cascades over a sparkling waterfall into a roaring whirlpool which disappears through a hole in the floor. Passages exit to the south and west.

This seems a decent enough try, but no novelist would write like this. Each important noun – "cavern", "stream", "waterfall", "whirlpool" – has its own adjective – "magnificent", "rushing", "sparkling", "roaring". The two "which" clauses in a row are a little unhappy. "Cascades" is good, but does a stream cascade "over" a waterfall? Does a whirlpool itself disappear? The "hole in the floor" seems incongruous. Surely it must be underwater, indeed deep underwater? Come to that, the geography could be better used, which would also help to place the whirlpool within the cave (is it in the middle? on one edge?). And why "Whirlpool Room", which sounds like one of the perks of a health club? Here is a second draft:

> *Whirlpool Ledge*
> The path runs a quarter-circle from south to west around a broken ledge of this funnel cavern. A waterfall drops out of the darkness, catching the lamplight as it cascades into the basin. Rapid currents whip into a roaring whirlpool below.

Even so, there is nothing man-made, nothing alive, no colour and besides it seems to miss the essential feature of all the mountain water-caves I've ever been to, so let us add a second paragraph (with a line break, which is easier on the eye):

> Blue-green algae hangs in clusters from the old guard-railing, which has almost rusted clean through in the frigid, soaking air.

The algae and the guard-rail offer possibilities. Perhaps there are frogs who could eat insect-eggs in the algae, or perhaps the player might find a use for iron oxide, and could scrape rust from the railing. Certainly the railing should break if a rope is tied to it. Is it safe to dive in? Does the water have a hypnotic effect on someone staring into it? Is there anything dry which would become damp if the player brought it through here? Might there be a second ledge higher up where the stream falls into the cave?

△ Lack of variety comes in many forms. Brian Howarth's eleven "Mysterious Adventures" games written for the Scott Adams game engine invent some interesting milieux ('Feasibility Experiment' (1982), with objects like "Vague Shapes", is worth a look) but they are highly repetitive and difficult to tell apart. The main weakness of 'Enchanter' is a sparse, location-heavy map, especially in the prologue, where many rooms over-describe their neighbours. Slightly at odds with the traditional dungeon elsewhere, 'Enchanter' blends in horror tableaux: dead grass "seems to grip at your feet", a demon statue "seems to reach towards you". There's a lot of "seeming" motion, because the deserted, blasted landscape is largely static: "listless waves barely stir the flotsam and jetsam" sums it up only too well. The outcome would have been mediocre had the puzzles in the game not been exceptionally good, and a few of the interior locations appealing. Here is a fine example of the interior room as vista, overlooking a landscape and drawing together the whole game's map:

> *Map Room*
> This room in the high tower appears to be a map room, with hundreds of ancient maps covering the walls. A huge globe, made of gold, sits on a pedestal in the center of the room. Through the tower windows can be seen a vast forest stretching out to the northeast and the sea, covered in fog, to the east and south. Stairs to the south lead to the bottom of the tower.

. . . . .

It is a vexed question just how much land occupies a single location. Usually a location represents a single room, perhaps ten yards across at the most. Really large chambers are usually given several locations, so that a ballroom might be divided into corners with names like "Ballroom Northwest" and "Ballroom Southwest". The "huge cave about 3,000 feet across" of 'Acheton' occupies no less than 16 locations, which although it conveys a sense of space can also seem repetitious and wasteful.

At the other extreme it is sometimes necessary for a single location to do duty for a great swathe of ground, especially out of doors, where drawing the map can leave one with the same frustration as the set-designer for a Wagnerian opera: everything indistinct and without edges. 'Spellbreaker', under tight constraints on locations, includes one-location meadows and volcanos. The reverse position is taken by the distinctive and plausible 'Gateway to Karos' (Derek Haslam, 1984). Locations are superimposed in a square map-like grid onto the rivers, cliffs, forest and so forth of the island of Karos, so that each location represents perhaps one square kilometer:

> *Eastlands*
> You are in a cluster of roofless, abandoned buildings, apparently part of an ore-washing mill. A dry water-channel runs northward, and a path leads west.

> A garden spade, well used but still strong and sharp, lies abandoned here.

(About a dozen neighbouring locations share the short name "Eastlands".) A middle position between 'Spellbreaker' and 'Gateway to Karos' is taken by 'She's Got a Thing For a Spring' (1997), an evocation by the nature photographer Brent VanFossen of the mountains of northwest America. Almost an interactive postcard, this thoroughly appealing game features elks, mooses, eagles and so forth, but is equally vivid with terrain and vegetation:

> *Granite Canyon*
> You're on a shelf overlooking a small canyon, apparently carved by the nearby stream and 20 or 30 feet deep. A rocky path enters from the west beside a tangle of blackberries, and dead ends at a ledge overlooking the stream below. Above you, granite walls continue to rise, the pink stones a beautiful contrast to the clear blue sky. An animal trail leads up, too steep to walk, but you might be able to make it in a scramble.
> Beside you stands a small tower supporting one end of a steel cable.
> The end of a spruce branch is just barely visible deep inside the blackberries.

A single location can also substitute for an infinite expanse, such as the Neverending Lane of 'Jinxter'.

Another consideration in outdoor locations is that the slow process of sunrise and sunset ought to affect room descriptions. 'Christminster' organises time so as to keep the player indoors between seven and ten p.m. so that only two states are needed, full day and full night. 'A Mind Forever Voyaging' derives most of its impact from its depiction of the same city decaying in ten-year stages, as it rolls forward in history like H. G. Wells's classic (and classically filmed) novel *Things To Come*. The definitive shifting-description game of recent years is Andrew Plotkin's 'A Change in the Weather' (1995):

> You're standing on a ledge, on a rather steep, overgrown hillface. Greenery hides the stream below and the hilltop above, and the meadows and sky beyond sweep away into the incandescent west.
>
> You're standing on a ledge, on a rather steep, overgrown hillface. Rain hides the stream below and the hilltop above, and to the west is only dark.

Descriptions alter not just through time passing, but also because of differences in perspective. Still the most remarkable example is the 'Suspended' complex, which a player in suspended animation controls through robots with different sensory perceptions. Here is the same place from four points of view:

> I'm in a large room which looks like the inside of a globe. The walls seem sculptured with wiring, swirling around the room's perimeter, leading into a tall column. The column itself has a door on its face. Doorways lead to the west, south, east and northeast.

> Sonar indicates a large, spherical open area with a hollow column running from floor to ceiling. The column reflects sonar evenly indicating no distinguishing external characteristics.
>
> All around me charges flow, shaped by the very nature of this room. The electrons are being channeled into an electrical column, central to this environment.
>
> A small humming can be detected from a column which extends from floor to ceiling.

Another device, used in the spy thriller 'Border Zone' (Marc Blank, 1987), is to respond to directions not with a description of the new location but with a response about how you got there:

> `>east`
> You open the door and walk out into the passageway. You scan the passageway, noting guards at either end, machine guns poised at their sides. You don't remember them from the beginning of the trip, so you can only suppose that security has been tightened in the search for the American agent.
> `>look`
> *Outside Your Compartment*
> You are standing in the passageway that runs along the length of the car. At either end of the passageway, a guard is standing, machine gun poised at his side. Right now, you're standing outside your own compartment.

• REFERENCES

Mike Berlyn (*XYZZYnews* 17) groups the issues here under the headings Size/Scope, Ceilings, Floor/Ground, Walls, Lighting and Mood (''a depressed person is not likely to have yellow-and-red throw pillows'': oh?). •Gerry Kevin Wilson offers three don'ts for room descriptions: ''1. Don't mention a player's actions in a description. 2. Don't mention moveable objects in a description. 3. Don't exceed one screenful of text in a description.'' •''Very often, a map or the plan of a building can suggest a plot element that no amount of abstract thought could generate.'' (Gil and Beryl Williamson, in *Computer Adventures – The Secret Art*.) •Wisest of all, perhaps: ''It's awful to sit down and think, 'I've got to write fifty room descriptions today, and each one of them has to be clear, crisp and vivid while conveying exactly the information I want it to convey' '' (Gareth Rees, Usenet posting, 7/6/94). Don't write them all at once.

§52 Finishing

> ''[A game in alpha-testing has] on the order of 4,000 bugs. Maybe fifty percent are spelling and punctuation errors, extra spaces, missing blank lines, and so on. Maybe one percent are crashes.''
>
> ''I try to make sure that the sun is in the right position, or if you're in outer space the sun and moon are where they're supposed to be – stuff like that. . . The wooden beam [in 'Infidel'] is described as being a certain length and width, and I calculated that it would have to weigh 500 pounds.''
>
> — Max Buxton and Gary Brennan (Infocom play-testers), 1987

So the game is built: the wood is rough and splintered, but it's recognisably a game. There is still a good month's work to do, easier work if less creative, and beyond that a good deal of drudgery to fix bug after bug after bug.† The first post-design task is to sort out the scoring system, usually awarding points out of some pleasingly round number and dividing them into rankings. Here is 'Zork II':

> Beginner (0), Amateur Adventurer (40), Novice Adventurer (80), Junior Adventurer (160), Adventurer (240), Master (320), Wizard (360), Master Adventurer (400)

This is disappointingly bland, and a more pleasing tradition is to name ranks for the player's profession in the game – so that an orchestral musician might begin as Triangle and rise through Second Violinist to Conductor. (In 'Sherlock', the lowest rank – corresponding to zero achievement – is Chief Superintendent of Scotland Yard.) Among the questions to ask are: will every winner of the game necessarily score exactly 400 out of 400? (This can be difficult to arrange if even small acts are scored.) Will everyone entering the end game already

† Dave Lebling starts work in the morning: ''Even a cup of yummy coffee won't improve things when you see 'page 1 of 12' on the first bug report form.'' Many good-natured pieces about testing appear in Infocom's publicity newspapers. At best, it was enormous fun, and Liz Cyr-Jones's testing department made a lively and exhilarating summer job. But there were also tensions. The tester who wrote that 12-page form saw it not as dismaying but as the proud result of a job well done. It could be frustrating that the bugs would be fixed at random intervals, or not at all, while revised versions of the game would sometimes arrive without any clear indication of what had altered. Brian Moriarty redesigned great swathes of game at the last minute, and the fact that he had always said he would did not make this any less maddening.

have a score of 360, and so have earned the title "Wizard"? Will the rank "Amateur" correspond exactly to having got out of the prologue and into the middle game?

Unless the scoring system is worked out and the game can pass its entire transcript of the "winning" solution without crashing or giving absurd replies, it is too soon to go into play-testing.

△ Scoring systems vary greatly. 'Adventure Quest' is scored "out of about 6,000", and exemplifies the pinball-machine-like tendency to offer points by 5s, 10s or 100s. Other games feel that one puzzle is one point, or award percentages, and still others frown on score altogether because "that's not how life works". In 'Moonmist', scores are described thus: "[Well, so far you've met Lord Jack and all of the guests, washed up from your trip... but you haven't found the hidden treasure nor enough evidence nor identified the ghost!]". In 'Zork III', the player's "potential" is given out of 7, corresponding to which of seven challenges have been encountered (so that a score of 7 does not mean the game is over). In 'The Lurking Horror', 20 major puzzles are awarded 5 points apiece for a maximum of 100: the 20th puzzle is to win the game. In some ports of 'Advent' 1 point is awarded for each room visited for the first time, and 1 for never having saved the game, a mean trick, plus the infamous "Last Lousy Point", awarded without any clue for dropping a particular object in a particular place, an irrelevant act achieving nothing. (People used to have to disassemble the mainframe game to discover this.)

. . . . .

During the writing and maintenance of 'Christminster', Gareth Rees kept a log of all 475 modifications prompted by play-testers and players. This log is archived with the game's source code at `ftp.gmd.de` and makes an interesting case study. 224 reports requested additional interactivity and responses, often to reasonable but wrong guesses made by the player. A further 86 arose from incorrect responses or inconsistencies, 32 from typographical errors and 79 from mistakes in computer programming, for instance in the game's complicated algorithms to handle telephony and the mixing of liquids.

At every stage in writing an interactive fiction it is easy to lapse into the habit of writing an uninteractive one. A designer who has written a linear story and then introduced some puzzles may imagine that the literary style and effect of the game comes from the text originally written, but that isn't altogether true: most of the player's time at the keyboard is spent trying the wrong thing, so most of the player's experience of the game lies in how it deals with wrong guesses. This means that it's essential to respond to as many of attempts as possible, acknowledging that the player has made honest attempts, and so helping to form a sort of relationship:

> In the aquarium is a baby sea-serpent who eyes you suspiciously. His scaly body writhes about in the huge tank.
> >take serpent
> He takes you instead. *Uurrp!*

This is from 'Zork II', a program which is at least twice the size of 'Advent' in spite of implementing a much smaller design. Almost all of that disparity is due to its generous stock of responses. Similarly, 'Zork I' contains possibly the first examples of alternative solutions to puzzles (the cyclops can be defeated in two different ways, as can the Loud Room). If a play-tester can think of a reasonable solution to which the game does not respond, it is worth considering a redesign of the puzzle to allow both solutions. Even if not, a response should be made which acknowledges that the player has made a good guess.

. . . . .

Bugs in interactive fiction are individually puny, yet daunting by their number, like a column of army ants. Just as the 'Christminster' log (see above) gives an idea of routine testing, so Graeme Cree's catalogue of bugs in released Infocom games (at `www.xyzzynews.com`) shows what can slip through the most rigorous testing regime. Here are some common types of bug:

- Slips of punctuation, spelling or grammar: for instance, ''a orange''. Infocom's games are quite clean in this respect, in part because an experienced editor of books, John Prince, proof-read their text. (The Inform compiler allows a designer to extract all the text of a game for spell-checking.)
- Rooms being dark when they ought to be light (which tends not to show if the designer habitually carries a lamp when testing), or not changing their state of light/darkness when they should: as for instance when a skylight opens, or when the sun sets, or when the candles in 'Zork I' are blown out. In 'Sherlock' (21/871214) an expert player can cross fog-bound London without a lamp, exploiting various items and places which turn out to have (undescribed) light.
- Secondary properties of an object neglected: such as a fish being marked as edible, or a door as fixed in place.† 'Starcross' (15/820901) neglected to mark a light beam as being inanimate, so that the player could get rid of it by typing ''beam, go west''.
- Map connections missed or mismatching. In 'Suspended' (8/840521), the corridor northeast from East End to Alpha FC has no connection back southwest: the designer simply forgot to make one.
- Something which ought to happen only once being possible more than once: such as the breaking of a window, or a character greeting the player as a stranger. The only known bug in any release of 'Wishbringer' (68/850501) allowed the player

† It wasn't until the fifth proofs of §12 of this manual that any of us noticed that the ''great stone slab'' altar of 'Ruins' had never been made `static`.

to take back a spent gold coin and spend it again, gaining ever more points *ad infinitum*.

- Failing to properly revise the state of the game after a major event. In 'Deadline' (18/820311), Ms Dunbar was sometimes able to appear even after her death and, indeed, to be present in the same room as her dead body.
- Small illogicalities: messages such as "The ball bounces on the ground and returns to your hand." in mid-air or while wading through a ford; or being able to swim with a suit of armour on, or wave the coat you're wearing, or eat while wearing a gas mask. In 'Hollywood Hijinx' (37/861215), you can empty a bucket of water while swimming underwater.
- Failing to check that necessary objects are actually present when the player tries by implication to use them. In 'The Witness' (22/840924), you can "get a drink" anywhere in the game.
- Containers with surreal abilities: such as a purse which can hold a stepladder, or a candle whose flame remains lit, or a book which can still be read even when stowed away inside a rucksack. Infocom's struggle with the 'Zork' container bug has passed into legend. Numerous cases were attended to, but in all eleven releases of 'Zork I' you can still put the raft in the coffin, and then the coffin in the raft, causing both to vanish.
- Forgotten names: for instance 'Planetfall' (20/830708) forgot to allow the player to call the microbe monster "microbe".
- Inadequate namings: in 'Deadline' (19/820427) the bathroom door on the first floor was impossible to open because the game called it simply "door", but with a closet door in the same location, an ambiguity arose which nothing the player could type would resolve.
- Actual bugs in code intended to extend the game's simulation of the world, and especially with ropes and liquids: in 'Infidel' (22/830916) filling the chalice when it is already full results in the text "The silver chalice is filled with water. The silver chalice is empty."

. . . . .

The days of play-testing are harrowing. Dave Lebling again, on 'Suspect':

```
>bartender, give me a drink
"Sorry, I've been hired to mix drinks and that's all."

>dance with alicia
Which Alicia do you mean, Alicia or the overcoat?

Veronica's body is slumped behind the desk, strangled with a lariat.
>talk to veronica
Veronica's body is listening.
```

("Little bugs, you know? Things no one would notice. At this point the tester's job is fairly easy. The story is like a house of cards – it looks pretty solid but the slightest touch collapses it.")

Good play-testers are worth their weight in gold. Their first contribution is to try things in a systematically perverse way. To quote Michael Kinyon, whose effect may be felt almost everywhere in the present author's games,

> A tester with a new verb is like a kid with a hammer; every problem seems like a nail.

And here is Neil deMause, on one of his play-testers:

> He has an odd compulsion, when he plays IF games, to close doors behind him. It's a bizarre fastidiousness, not even remotely useful for an IF player, but I love him for it, because he has uncovered bugs in this way that I never would have found.

Games substantially grow in play-testing, and come alive. Irene Callaci's acknowledgements could speak for all designers:

> I thought perhaps beta testing might reveal a couple of odd, off-the-wall commands that weren't implemented, or maybe a typo here and there, or possibly an adjective or two I had forgotten. Not! I wasn't even close to being finished, and I didn't even know it. 'Mother Loose' grew from 151K to 199K during the beta testing period alone. Looking back now, if I had released 'Mother Loose' when I thought it was ready, I would have crawled under a rock from embarrassment. Thank you, thank you, thank you to all my beta testers.

More is true even than this: the play-tester is to interactive fiction as the editor is to the novel, and should be credited and acknowledged as such. Major regions of 'Curses' and 'Jigsaw' were thrown out politely but firmly by my own play-testers as being substandard or unsuitable.† A radical response to the play-tester's doubts is almost always better than papering over cracks.

After a first pass by one or two play-testers, and a consequent redrafting exercise, the game can go to beta testing at the hands of perhaps six or seven volunteers, who come to it fresh and treat it more as an entertainment and less as an unexploded bomb. (At one time Infocom used two phases of beta-testing, sometimes involving as many as 200 volunteers, even after pre-alpha and alpha-testing in house.) It is wise to insist on reports in writing or email, or some concrete form, and to ask for a series of reports, one at a time, rather than waiting a month for an epic list of bugs. It can be useful for play-testers to keep transcripts of their sessions with the game, and send them verbatim, because these transcripts are eloquent of how difficult or easy the puzzles are and which wrong guesses are tried. In its debugging version, 'Jigsaw' provided a verb called ''bug'' purely to help players type comments into such a transcript:

† Similarly, the published source code to 'Christminster' contains ''offcuts'' such as a pulley-and-rope puzzle in the clock tower.

```
>bug Miss Shutes is known as he
```
Oh dear.
```
>bug The corn bread isn't edible
```
Is that so?

It is worth keeping in touch with play-testers to ensure that they are not utterly stuck because of a bug or an unreasonable puzzle, but it's important to give no hints unless they are asked for.

. . . . .

A game is never finished, only abandoned. There is always one more bug, or one more message which could be improved, or one more wry response to drop in. Debugging is a creative process, even beyond the initial release, and games commonly have four to ten revisions in their first couple of years in play.

In the end, of course, the designer walks away. Almost all the pre-1990 designers cited in the bibliography are still alive, but few are still designing, and they often speak of their games as something fun but belonging to another time in their lives: something they feel faintly self-conscious about, perhaps, something that they did years ago: when they were in high school, when their kids were young, when they did a little testing for Infocom, when computers were less visual, when it was the state of the art, when the Ph.D. was at an impasse. But if twenty-five years is an epoch in computing, it is not a long time in the history of art, and the early designers remain a presence in a genre which is younger and less settled than sometimes appears. Once in a while Scott Adams causes a *frisson* by throwing a remark into a newsgroup mostly read by designers to whom he seems a historical figure coeval with Scott of the Antarctic. Can such a man really have an email address?

In a recent radio broadcast (1999), Douglas Adams said that the great enjoyability of working on his games with Infocom was having fun with a new medium before it became an art form and had serious articles written about it. (Which pretty much puts this chapter in its place.) But that original fascination dies hard, and the first and happiest discovery of anyone researching into interactive fiction is that designers past are only too pleased to be rediscovered, and willing to go to great trouble – hunting through archives, attics and obsolete equipment – to see that their games can be trodden again.

An adventure game can be one of the most satisfying of works to have written: perhaps because one can always polish it a little further, perhaps because it has hidden and secret possibilities. But perhaps too because something is made as well as written: and once made can never be unmade, so that there will always be a small brick building by the end of the road, and in it there will always be keys, food, a bottle and the lamp.