

## Chris Crawford and Computer Game Aesthetics

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### *\*Whicha Way Did They Go?*

Most current research on computer games<sup>1</sup> answers one of three questions:

#### 1. Who are video game players?

Demographic and psychographic analyses (Gibb et al, 1983; Jones, 1984; Melancon & Thompson, 1985; Jones et al, 1986) reveal little about videogame players other than the sort of obvious, common-sense conclusions available from less rigorous observations. Typical studies conclude that videogame players are most often young, bright, competitive males (Kaplan & Kaplan, 1983; McClure & Mears, 1984; Hanson, 1987). Preliminary research has failed to demonstrate significant correlations between videogame play and more revealing individual characteristics—such as self-esteem and aggressiveness (Harris & Williams, 1985; Dominick, 1984).

#### 2. What do video games do to players?

The largest amount of research in this area has concentrated on the educational use of videogames by children (Driskel & Dwyer, 1984; Campbell & Schwartz, 1986)—largely in attempts to justify computers in the classroom.

Researchers have also investigated short-term effects of videogame play on aggression (Anderson & Ford, 1986; Cooper & Mackie, 1986; Graybill et al, 1985; Kappes & Thompson, 1985). Others have studied long-term effects of the videogame, either related to cognition (Lin & Lepper, 1987; Dorval & Pepin, 1986; Lowery & Kirk, 1982) or social skills (Surrey, 1982; Eglie & Meyers, 1984; Strein & Kachman, 1984; Hull, 1985; Creasy & Myers, 1986).

Scholarly discussions of potential relationships between computer and child—and questions for future research within educational and mass communications contexts—are found in Paisley & Chin (1984) and Condry & Keith (1983).

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Loftus & Loftus (1983) and Greenfield (1984) give layman-style overviews of how videogame play might affect both individuals and groups.

### 3. Why do people play videogames?

This area of research deals with self-determined player motivations (Myers, 1984), player motivations among males and females (Morlock et al, 1985), player motivations within social groups (Panelas, 1983), and player motivations in association with particular types of computer game content or effect (Nelson & Carlson, 1985; Mehrabian & Wixen, 1986).

Results have frequently been lists of "gratifications" players gain from playing videogames (Selnow, 1984; Wigand et al, 1985)—such as "companionship" and "a sense of control"—and/or a list of game characteristics most likely to gratify players (and thereby motivate play).

The "intrinsically motivating" videogame characteristics found in Malone (1981) have been most influential. Malone describes in detail three game characteristics vital to player motivation: "challenge," "fantasy," and "curiosity." According to Malone, these characteristics served as "a checklist of heuristics to be used in designing instruction environments" (Malone, 1981: 364).

Whereas, unfortunately, all three of the above questions remain largely unanswered, research in the latter area has had some impact in developing a computer game aesthetic. Malone's work, in particular, outlines a clear (clearly functional) aesthetic.

Taken as a whole, however, current research on "videogames" sloppily considers all computer games roughly equivalent in uses and effects. Most of this research, in fact, concerns arcade-based videogames, which are more easily accessible to researchers and have had (briefly) greater penetration than more complex and sophisticated, home-based computer games.

Plus, aside from review articles in popular literature, there is little critical analysis of computer game structure and form. Most serious research continues to concern psychological and/or sociological effects of game play.

Yet the context of home computer game play recommends aesthetic/textual rather than social/behaviorial analyses. Computer game play in the home is personal and private. The game-playing experience requires an absence of distractions; and that experience is more closely physically analogous to reading a book than playing billiards.

It is not surprising, therefore, that when critics (Niesz & Holland, 1984; Navas, 1985; Gerber, 1985) do turn their attention to the computer game, they discover and discuss familiar categories of form and content, structure and materials. This analysis has legitimized the popular term

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"interactive fiction" as most descriptive of computer game as art—without truly good reason.

Based on this model (playing a computer game is like reading a book), critical analysis of computer games remains superficial and negative.

What critics have found lacking in the computer game is what they have seen and found elsewhere as lending distinction and excellence to the novel, the play, and the short story: language, character, and plot.

These are fine narrative qualities to champion. But they are seldom sought (as such) in painting or sculpture or dance. These same characteristics are also defined and evaluated quite differently within popular media—such as television. In the former instances, critics consider balance, symmetry, and color. In the latter, humanistic critics highlight medium "value and attitudes" (Newcomb, 1982: 478) or television "conventions" (Allen, 1987: 2) as more important than the specific form and content of individual programs.<sup>2</sup>

The computer game—if it is a unique art form—deserves a correspondingly unique set of aesthetic criteria. Clearly, the computer game is not aesthetically equivalent to the short story or novel. Technology alone gives it separate status.

The visible component of the computer game most closely resembles that of film—or television. Computer game players are presented a succession of screens. Images are designed and drawn within these screens according to rigidly defined, rectangular format. These images are graphed, plotted, translated, stored, and eventually reproduced as electronic pixels.

Aesthetic criteria—borrowed from film—are readily available to evaluate these screens. We might judge computer game screens in the same way we judge the frames of a film. We might look for the establishing shot, the close-up. We might find both detail and abstraction. We might precisely define composition and evaluate the shape of the computer game as it appears statically, on the screen, in a fixed space.

But what happens when these images—these screens—are moved, shuffled, and animated?

What shape does the computer game take with movement through time?

Film frames are animated and the eye is fooled. Motion is seen where no motion exists. This illusion of motion is normally created according to the requirements of plot and story.

But "motion" in the computer game is not set mechanically at 32 or 64 or 128 frames per second. "Motion" in the computer game may or may not rely on unravelling of plot or discovery of character or revelation of theme.

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These elements (as well as the terms and concepts traditionally used to describe them) are dynamic—but fixed. Computer screens are dynamic—but *mutable*.

The computer game is a *non-linear* art form.

This means that computer games interact and transform. They change—not only through time, but *over* time. Their shape changes from player to player, from playing to playing.

“Plot” is an inadequate description of this change; “drama” is not quite right; perhaps “theme” comes closest; maybe “personality” is closer still. But there are few, if any, analogies to guide us in defining the aesthetics of computer game *dynamics*.

Best perhaps, at this early stage in the evolution of the computer game, to turn to those who have successfully mastered its form. What are their personal goals, their individual methods? What are the idiosyncratic aesthetics of computer game designers?

### *\*Chris Crawford and The Art of Pedagogy*

Those who create computer games are neither writers nor composers; they are properly *designers*. Of leading game designers, Chris Crawford is the young field's most self-conscious artist.

Crawford's first game design translated popular wargames of the early 1970s to the computer. These initial, amateur attempts culminated in a game that was later published by Avalon Hill (in 1981 in revised form) called *Tanktics*.

#### *Tanktics*

*Tanktics* simulated tactical tank battle during WWII. The game player commanded American tanks; the computer commanded the adversary German tanks.

Like the wargames on which it was based, the visible world of *Tanktics* was dominated by hexagonal game-board. No visual elements were built into the program itself. *Tanktics* computer screens showed only numerical coordinates that had to be plotted on the (entirely separate) game-board distributed with the computer game cassette.

The main appeal of *Tanktics*—and most other computer wargames of the period—was that a game could be played without having to solicit another (human) player. Of course, this assumption was only true insofar as the computer program played an appropriately “human” game. And the success of *Tanktics*—modest but significant in furthering Crawford's career as a game designer—was based on the worthiness of the artificial intelligence (AI) routines driving the computer opposition.

Wargamers found that the *Tanktics* program played a decent (though limited) game. And Chris Crawford discovered how important artificial intelligence routines were to game popularity and verisimilitude. A

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computer game did not have to be colorful, or fast, or complicated to be successful; it only had to act, in some basic, rudimentary way, *human*.

This realization became the core, the root of Crawford's increasingly successful computer game aesthetic.

### *Eastern Front*

Neither Chris Crawford nor anyone else considered *Tanktics* a work of art. Yet after *Tanktics*, Crawford found his games increasingly in demand. He joined Atari in 1979 as a designer; and, during his tenure with Atari, Crawford released his most commercially successful<sup>3</sup> computer game: *Eastern Front (1941)*.

*Eastern Front* was *Tanktics* expanded and improved.

The visible portion of *Eastern Front* was a huge, innovative, scrolling map of Russia, complete with cities, forests, and changing seasons. The computer screens contained the entire game-board; there was no need for counters or awkward hexagonal overlays. Players interacted with this computer-generated world solely through a joystick—intuitively—sliding left and right, north and south, to discover enemies and reinforce allies.

The game player commanded the invading Germans in *Eastern Front*, while the computer opponent commanded the defending Russians. And once again, just as with *Tanktics*, despite the superficial attractiveness of the game, the success of *Eastern Front* was determined by the quality of the invisible AI routines directing the Russian forces.

Aided by large numerical superiorities, the Russian command was tough. Furthermore, unlike the Germans in *Tanktics*, the Russians in *Eastern Front* seemed to have a personality. A rather bland, stoic, non-sense personality to be sure—but a personality nonetheless.

The large number of effective defensive strategies in *Eastern Front* gave the impression that the computer was selecting among its many alternatives according to certain emotional, not always strictly logical, preferences. If the German units were observed in weak position, the computer might choose to counterattack immediately—or it might choose to postpone its advance to more favorable winter months.

Was there rash impetuosity revealed in the choice to attack immediately? Did the computer need revenge so desperately, so soon? Or was there a dark and hidden sneer in the choice to delay, seducing German units deeper and deeper into the Russian heartland?

The number of German strategies were equally varied, equally affective; and *Eastern Front* was much more replayable than *Tanktics*. Unfortunately, the choices the game offered were not infinite. And, upon repeated replay, the Russian forces slowly became more and more predictable, less and less realistic. The human player learned and became a better player; the computer did not, always maintaining the same reasonable, consistent, losing level of play.

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Crawford had increased the complexity of his game-world in *Eastern Front*, and he had made the visible components of the computer game more entertaining and accessible. There was a vastly increased number of static details in these components, requiring a greater variety of dynamic choices from the human player.

Likewise, the invisible component of *Eastern Front*, the AI software that animated the defending Russian forces, was vastly improved. The computer opponent seemed to play according to recognizably human emotions and goals.

The game of emotions first invoked by *Eastern Front*, the pull and tug of different personalities, was eventually reduced to a colorless exercise of bloodless intellect. All tension, all suspense, disappeared on repeated play.

Nevertheless, *Eastern Front* was a significant advance over *Tanktics*—particularly in providing flavor and substance to the computer opponent. In the *Eastern Front* manual, Crawford (1981) acknowledge the game's accomplishments...

The feature I am most proud of is the artificial intelligence the game uses... (Crawford, 1981: 12)

...and its deficits.

It is a trifle presumptuous of me to call it artificial intelligence, for the computer does not learn from its mistakes nor does it adjust its strategies in direct response to the human's move. (Crawford, 1981: 12)

Crawford believed that popularity—perhaps even art—lay in creating a realistic *human* interface between player and game. In further work, Crawford increasingly concentrated on endowing this relationship with depth and complexity; unfortunately, he chose to define this relationship solely in terms of *conflict*.

Conflict is fundamental to all games... A number of attempts have been made to design games cleansed of conflict. Such attempts emphasize cooperative efforts rather than conflict. Few people seem to enjoy them. (Crawford, 1984: 11)

In fact, however, the deadly dance between Russian and German forces in *Eastern Front* was as cooperative as conflicting; a realistic war "drama" was created only when both opponents acted properly in concert. Indeed, the nagging problem with the *Eastern Front* was that the Russians did *not* cooperate on repeated play: they didn't get better, as the player wished and expected they would. The Russians were too obstinate, *too* much in "conflict" with the player's desires and needs—like a dance

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partner steadfastly refusing to learn the most difficult (and most satisfying) steps.

Furthermore, *Eastern Front's* Russian landscape was as interactive and as "human" as its Russian tanks. That landscape could either be friend or foe, depending on who—Russian or German—was forced to retreat across its swamps and rivers. Successful play (*emotionally successful play*) required subtle understanding (and cooperation) between player and game-world: both opponent and landscape, character and context.

Crawford saw only that the conflict between German tanks and Russians tanks in *Eastern Front* was too simple and plain, too quickly and easily resolved to sustain player interest.

#### *Legionnaire*

Defining the most critical component of computer game play as an antagonistic relationship between player and opponent—and failing to acknowledge the more cooperative aspects of meta-play—led Crawford to design increasingly more belligerent computer opponents.

One of Crawford's first attempts to add variety and life to the robotic Russian commanders of *Eastern Front* was his revision of *Legionnaire*.

Crawford had written *Legionnaire* shortly after the early success of *Tanktics*; and the game was originally very similar to *Tanktics*. Instead of controlling American tanks against German panzers, the player controlled Roman legions against barbarian hordes. In its initial release, however, *Legionnaire* was not as successful as *Tanktics*.

When Avalon Hill re-issued *Legionnaire* in 1982, Crawford had made important changes to the game. The visible components of the game were vastly improved. The same scrolling system developed in *Eastern Front* was implemented. Sound was added (the constant pounding of horses' hooves). And, most significantly, *Legionnaire's* computer opponent was dramatically refined.

Instead of one opponent, *Legionnaire* players were given several: eight types of barbarian infantry and an equal number of hostile barbarian calvary. Similarly, the *Legionnaire* human player had ten different Roman legions—each with a different commander—to direct against his enemies.

*Legionnaire* attempted to enhance game play by offering an increased number of opponents. Unfortunately, no single opponent in *Legionnaire* was as formidable (or as convincingly human) as the Russians in *Eastern Front*.

Increasing the quantity of opponents did not prove, by itself, a viable solution. The computer game took on more dynamic shapes *through*—but not *over*—time; game play was extended, not enhanced.<sup>4</sup>

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### *The Art of Computer Game Design*

Though yet to find an adequate solution to the problem of proper computer game play dynamics, Crawford was at the height of his popularity in the early 1980s. *Tanktics* was a landmark game; *Eastern Front* continued to sell well; and Crawford had new game contracts with Avalon Hill as well as his continuing assignments at Atari, which was the current mover and shaker of the computer game industry.

Crawford wrote a technical book on the Atari computer, *De Re Atari*, and then a mass-market book which acknowledged his position as the country's leading computer game artist: *The Art of Computer Game Design: Reflections of a Master Game Designer* (1984). This latter book defined terms in the computer game field, described the design process, and established goals for the successful computer game designer. It was, in short, a treatise on computer game aesthetics.

The book is brief but enlightening. It is immediately apparent that Crawford continued to define computer game play solely in terms of conflict. The computer game designer's task was to create a worthy opponent for human players, and this task was properly accomplished by using various tricks to hide the computer's obvious deficiencies in thinking and acting human—tricks similar to those applied in *Legionnaire*.

But Crawford's "artificial smarts" routines are implemented only to "challenge the human being" (Crawford, 1984: 77). There is no discussion in *The Art of Computer Game Design* of the value of artificial intelligence as anything other than a human foil.

The problems of being forced to use a single-minded, "artificially smart" computer opponent within the dynamic and mutable context of the computer game are overcome (in Crawford's analysis) by a smooth "learning curve" and the "illusion of winability."

As a player works with a game, steady and smooth improvement in score should result. . . . A smooth learning curve results from a game that provides a smooth progression from beginner's level to expert. This requires the game designer to create not one game but a series of related games. . . .

If a game is to provide a continuing challenge to the player, it must also provide a continuing motivation to play. It must appear to all players, from beginner to expert, that the game can be won. Yet it must never be truly won or it will lose its appeal. (Crawford, 1984: 91-92).

There is, in this analysis, the hint of a deceitful relationship between player and game. While player and computer opponent might compete equally, the game designer maintains some hidden, manipulative, and advantageous position above and beyond both. Though the computer opponent might be mastered, the game itself must remain unconquerable, always placing another carrot in front of the player's horse.<sup>5</sup>

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### *Excalibur*

Crawford's next game, *Excalibur*, was intended to be his crowning achievement.

I resolved to devise a game worthy of the faith Dr. [Alan] Kay had invested in me. I wanted this game to be grand and glorious, so lofty in its goals and challenging in its play that it would put all others to shame. (Crawford, 1984: 93)

Crawford devoted an entire section of *The Art of Computer Game Design* to record the design process of *Excalibur*.

The player in this game would be King Arthur, and his goal would be to unify Britain and bring peace to the troubled land. The challenge of the game would arise from the unwillingness of the other kings to submit to Arthur's sovereignty. The player would be required to use various techniques to establish his authority, only one of which would be military action. . . With these noble goals established, I began serious design work on the game. (Crawford, 1984: 94)

Crawford was so intrigued by *Excalibur* that he wrote a "novel" to distribute with the program.

My original intentions was that the novel would explain the entire game and that no other documents would accompany it. (Crawford, 1984: 101)

Clearly, *Excalibur* was intended to be more than an extremely popular game; it was to be a work of art. This game was to contain all of Crawford's earlier innovations: continuous action in the form of scrolling messages at the bottom of the screen; a large, complex game-world displayed over multiple screens; and, most importantly, strong artificial intelligence routines to engage and challenge the player.

The AI for *Excalibur* was the most difficult I had ever attempted. (Crawford, 1984: 100)

*Excalibur* was not a success. The novel-manual was too obscure, and the game rules were too complex, too well hidden in Crawford's Arthurian England.

The computer game opponents were ostensibly rival kings to the throne of England. But these were straw men; the cleverest and most human opponent in *Excalibur* was England itself: the entire carefully constructed game-world. *Excalibur's* AI routines manipulated the economic, military, and geometric factors of England—in addition to the personalities of that country's various nobles and lords. Winning required intimate knowledge of Crawford's meticulously imagined society. And the game player, once in possession of this knowledge, could not be in conflict with the designer's vision.

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Indeed, I resolved that overuse of military methods would brutalize the nation and result in endless insurrections and anarchy. (Crawford, 1984: 94)

The successful Arthur learned the lessons proffered by the game-world—or else.

In *Excalibur*, Crawford, once and future teacher, had indeed found a way to predictably manipulate the computer game dynamics: pedagogy. And, despite *Excalibur's* popular failure, Crawford continued to admire this game as a pure expression of a singular world view, with political lesson as artistic theme.

I [Crawford] am very proud of [*Excalibur*] for the artistic attempt I made with it...It did not succeed anywhere near as well as I had hope, but there's still a lot to proud of. (Boosman, 1987: 57)

### *Balance of Power: The Game*

Amidst the computer game bust, Crawford was laid off from Atari. His next serious game was *Balance of Power*, designed free-lance and sold (after initial rejections by major publishers) to Mindscape.

*Balance of Power* has received quite a bit of critical attention, including mention in *Newsweek* (Rogers, 1985) and the *New York Times* (Aaron, 1985). But the game, like *Excalibur*, has yet to achieve the popular success of *Eastern Front*.

*Balance of Power* is the game Chris Crawford is now "proudest of" (Boosman, 1987: 56) and, indeed, the technical accomplishments of the game are exceeded only by *Eastern Front*.

The visible components of *Balance of Power* are as striking, for their time, as those of *Eastern Front*. Where *Eastern Front* had scrolled effortlessly across western Russian with the Atari joystick, *Balance of Power* uses a MacIntosh-inspired mouse to zoom in and out of sixty-two countries. The game-world is ostensibly the real world; and the visible components of *Balance of Power* consist of real data: populations, natural resources, telephones per capita.

The invisible component of *Balance of Power*—the software—includes the complex AI routines that put the countries of the game world into ideological motion. The game player is political chief of either the U.S. or the U.S.S.R. (his choice). The computer plays his opponent.

The superficial goal of *Balance of Power* is to maintain peace (and not plunge the world into nuclear disaster) while accumulating more political status and prestige than your superpower opponent. Players are allowed, among other things, to send military and economic aid to foreign countries and otherwise interfere in the internal affairs of other nations.

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The human player and his computer opponent have an enormous number of choices to make in playing the game. But, like *Excalibur*, the world of *Balance of Power* has a mind of its own. And, for all the offered choices, there is but a single strategy that allows the game to be won.

The most effective player strategy in *Balance of Power* is to do nothing, to allow the world to spin naturally, as the world will—until or unless your computer opponent stumbles into a fatal act of hubris. Then you might teach and punish that opponent in quick rebuttal—as it waits to teach and punish you.

The lesson of *Balance of Power* is that the only way to win the game is not to lose the game. And that lesson is incontrovertible.

### *Balance of Power: The Book*

Crawford wrote a three-hundred-page book, *Balance of Power: International Politics as the Ultimate Global Game*, to serve as a supplement to *Balance of Power* and further explicate its game-world. This book suggests, as the *Excalibur* novel did earlier, that Crawford's artistic reach (and pedagogical intentions) extend beyond the mass-market computer game.

This book, like *The Art of Computer Game Design*, details Crawford's evolving sense of the computer game aesthetic, according to several principles:

\*A computer game is not strictly a work of art—"a game communicates...an artistic message." (Crawford, 1986: 9)

\*Game *personalities* are not as important as game *processes*—"You can interact with a process...Ultimately, you can learn about it." (Crawford, 1986: 15)

\*And, according to Crawford, the best measure of the success of a game is that the player learns the principles behind that game "while discovering inevitable flaws in its design...A game should lift the player up to higher levels of understanding..." (Crawford, 1986: 16)

*Balance of Power* was designed according to these principles; and *Balance of Power* remains an "intensely personal statement" for Chris Crawford (Crawford, 1986: 191).

*Balance of Power* is playable; it is enjoyable. It is not as playable or as enjoyable as *Eastern Front*. The relationship between German and Russian tanks in *Eastern Front* is a dialogue, a dialectic; the relationship between U.S. and U.S.S.R. in *Balance of Power* is a speech, a lecture.

Crawford's later work increasingly suffers from his excessive manipulation and control of the computer game through and over time—intrusions into the game's natural dynamic form. Crawford displays an

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enormous palet of technical skills in constructing *Balance of Power* in visible space, screen by individual screen; yet his earlier, relatively cruder efforts remain more satisfying to play and ponder over time.

### *\*Conclusions: New Questions*

Chris Crawford's efforts in computer game design are among the few that offer qualified aesthetic guidelines. In his work, the problem of quality is addressed sufficiently to allow aesthetic analysis. In addition, Chris Crawford's games, because of his self-documentation of their design process, have clearly defined goals set according to explicit aesthetic criteria.

Does Crawford's personal aesthetic work? Does it produce "artful" computer games?

No, not really.

Crawford's work seems to err most in not defining computer game conflict within the larger context of computer game cooperation. "Conflicts" established through human play often begin subtle, enriching, and long-term relationships based on growth of personalities rather than learning of "processes."

Yet even as pedagogy, even as lessons better memorized than learned, Chris Crawford's games display more of the possibilities of computer game as art than current literary analysis of "interactive fictions."<sup>6</sup>

Literary analysis of the computer game errs at deeper levels. Computer games, after all, are not read. Computer games are, as the best game designers intuitively understand, *played*.

"Interactivity" explains and motivates only the most superficial play. It does not distinguish between good and better games; it does not even distinguish between the good and the bad.

The important question facing computer game critics quickly becomes obvious through analysis of Crawford's designs:

What is a proper aesthetics of *play*?

That is, what shape should the computer game take dynamically, both through and *over* time? What sort of relationship must exist between player and game, if that game is to be considered a creative work of imaginative and artful *play*?

Play is neither purely functional nor inevitably a contest between opponents. Play is intrinsically motivated from within its players—not by games, not by critics, certainly not through the implementation of properly shaped "learning curves" (Crawford, 1984) with plateaus crowned by obvious (but increasingly difficult) player "goals" (Malone, 1981).

A computer game prioritizing challenge/conflict requires an imbalanced relationship between player and game—and an artificial relationship between player and opponent. Based on this principle,

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Crawford's designs turn inevitably didactic. And his stated aesthetic mistakes the "illusion of winability" for the more profound and ineffable mystery of simple human truths.

Recent theorists of reader response (such as Stanley Fish, Norman Holland, or Wolfgang Iser) contend that...the reader does not merely passively accept or receive a given literary work but through the act of reading participates along with the author in the creation of the fictional world evoked by the heretofore lifeless text. Accordingly, one cannot truly say a work of literature exists until it is activated by the intervention of the reader, at which point the work may be said to exist through or within the dialectical process called reading. (Niesz & Holland, 1984: 122)

Computer game as art requires a similar sort of understanding—but of a different sort of process: that dialectical process called *play*.

### Notes

<sup>1</sup>See also Rice (1983: 66-68) and Price (1985). This paper cites only scholarly articles published subsequent to or ignored by the Rice analysis. Price gives several references to useful consumer/industry magazines.

<sup>2</sup>This is not to say that common medium characteristics are unapparent through the analysis of form and content within individual programs—a technique used by Newcomb (among others) and used later to discuss Chris Crawford's computer games.

<sup>3</sup>Chris Crawford states that "in commercial terms, *Eastern Front* outstrips everything else I've done by at least a factor of four." (Boosman, 1987: 56) This is despite reports of the first 4,000 copies of *Balance of Power* selling out "immediately"—at \$49.95 each. (Rogers, 1985: 80) *Eastern Front* has sold approximately 60,000 copies. (Aaron, 1985: 33)

<sup>4</sup>Crawford took further steps to improve *Legionnaire*. He made game play continuous by making game movement simultaneous—in real-time.

In *Eastern Front*, in accordance with accepted wargame practice, the Germans rested while the Russians moved—and vice versa. In *Legionnaire*, Roman and barbarian opponents moved at the same time; and speed was often as important as accuracy in giving orders.

Whereas arcade videogames of the period commonly used simultaneous, real-time movement of player and opponent, this format was an innovation for a strategy-based computer wargame.

This type of movement had a practical function in this instance: it decreased the time available for the *Legionnaire* player to ponder and discover the dim-witted artificial intelligence of the barbarian opponents.

Simultaneous, real-time movement might impose time restrictions on game play for dramatic reasons as well.

Film-makers have an advantage over computer game designers in this regard. A ten-second scene will always take ten seconds, each and every time the film is shown. Computer game designers have no such control over the time period in which their game is played—unless they impose artificial controls over the "pace" of the game, as Crawford did in *Legionnaire*.

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But this element of *Legionnaire's* design—like that of multiple opponents—proved unsatisfactory. The pressures of simultaneous, real-time movement seemed unnecessarily intrusive to the non-linear dynamics of the computer game. Crawford himself had second thoughts about its use.

Increasing pace only succeeds by depriving the human player of the time needed to invest more imagination to the game. Without that investment, the game can never offer a rich interaction. Pace does for computer games what the one-night stands does for romance. (Crawford, 1984: 84)

<sup>5</sup>Admittedly, while advancing the credo of puzzle-maker, Crawford also argues strongly for the computer game as a medium of artistic expression.

A game must have a clearly defined goal...The selection of a goal is undeniably the most subjective process in the art of computer game design. This is your opportunity to express yourself; choose a goal in which you believe, a goal that expresses your sense of aesthetics, your world view. Honesty is an essential in this enterprise. (Crawford, 1984: 60)

*The Art of Computer Game Design* also discusses the problems and possibilities faced by computer game designers interested in elevating their craft to art.

The game designer has here a tool that is more subtly indirect than traditional art. In traditional art forms, the artist directly creates the experience that the audience encounters. Because this experience is carefully planned and executed, the audience must somehow be prevented from disturbing it. In a game, the designer creates not the experience itself by the conditions and rules under which the audience will create its own individualized experience. (Crawford, 1984: xii)

Nevertheless, in subsequent game designs, Crawford viewed the interaction between player and game as necessarily lopsided, dominated by the hidden hand of designer. And, as a result, his computer game aesthetic tilted dangerously close to propaganda: his designs no longer played—they began to teach.

<sup>6</sup>At best, analyzing computer games as "interactive fictions" is a type of genre analysis that fails to consider the larger aesthetics of computer game play—of which interactive fictions are but a single part.

### Bibliography

- Aaron, D. (1985, December 29). Playing with Apocalypse. *New York Times*, pp. 22-23.
- Allen, R.C. (1987). Talking About Television. In R.C. Allen (Ed.), *Channels of Discourse* (pp. 1-16). Chapel Hill, NC: University of North Carolina Press.
- Anderson, C.A. & Ford, C.M. (1986). Affect of the game player short-term effects of highly and mildly aggressive video games, *Personality and Social Psychology Bulletin*, 12, 390-401.
- Boosman, F. (1987, Jan-Feb). Designer Profile. *Computer Gaming World*, pp. 56-59.

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- Campbell, P. F. & Schwartz, S.S. (1986) Microcomputers in the Preschool: Children, Parents, and Teachers. In P.F. Campbell & G.C. Fein (Eds.), *Young Children and Microcomputers* (pp. 45-62). Englewood Cliffs, NJ: Prentice Hall.
- Crawford, C. (1981). *Eastern Front (1941) Manual*. Sunnyvale, CA: Atari Program Exchange.
- (1984). *The Art of Computer Game Design*. Berkeley, CA: Osborne/McGraw-Hill.
- (1986). *Balance of Power*. Redmond, CA: Microsoft Press.
- Condry, J. & Keith, D. (1983). Education and Recreational Uses of Computer Technology: Computer Instruction and Video Games. *Youth & Society*, 15 (1), 87-112.
- Cooper, J. & Mackie, D. (1986). Video games and aggression in children. *Journal of Applied Social Psychology*, 16 (8), 726-744.
- Creasy, G.L. & Myers, B.J. (1986). Videogames and children: effects on leisure activities, schoolwork, and peer involvement. *Merrill-Palmer Quarterly*, 32 (3), 251-262.
- Dominick, J.R. (1984). Videogames, television violence, and aggression in teenagers. *Journal of Communication*, 34 (2), 236-247.
- Dorval, M. & Pepin, M. (1986). Effects of Playing a Video Game on a Measure of Spatial Visualization. *Perceptual and Motor Skills*, 62, 159-162.
- Driskel, J.E. & Dwyer, D.J. (1984). Microcomputer videogame-based training. *Education Technology*, 24, 11-15.
- Eglie, E.A. & Meyers, L.S. (1984). The role of video game playing in adolescent life: Is there reason to be concerned? *Bulletin of the Psychonomic Society*, 22 (4), 309-312.
- Gerber, C.H. (1985, August). Adventure Game as Literature. *Online Today*, p. 8.
- Gibb, G.D., Bailey, J.R., Lambrith, T. & Wilson, W. (1983). Personality differences between high and low video game users. *Journal of Psychology*, 114, 159-165.
- Graybill, D., Kirsch, J.R., & Esselman, E.D. (1985). Effects of Playing Violent versus Nonviolent Video Games on the Aggressive Ideation of Aggressive and Nonaggressive Children. *Child Study Journal*, 15 (3), 199-205.
- Greenfield, P.M. (1984). *Media and the mind of a child: From print to television, video games and computers*. Cambridge, MA: Harvard University Press.
- Hanson, J. (1987). Video games: competing with machines. In S. Thomas (Ed.), *Studies in Communication 3*, (pp. 139-149). Norwood, NJ: Ablex.
- Harris, M.B. & Williams, R. (1985). Video games and school performance. *Education*, 105 (3), 306-309.
- Hull, J.W. (1985). Videogames: Transitional phenomena in adolescence. *Child and Adolescent Social Work*, 2 (2), 106-113.
- Jones, M.B. (1984). Video Games as Psychological Tests. *Simulation & Games*, 15 (2), 131-157.
- Jones, M.B., Dunlap, W.P., & Bilodeau, I.M. (1986). Comparison of video game and conventional test performance. *Simulation & Games*, 17, 435-446.
- Kaplan, S.J. (1983). The image of amusement arcades and differences in male and female videogame playing. *Journal of Popular Culture*, 23, 93-98.
- Kaplan, S. & Kaplan, S. (1983). Video games, sex, and sex differences. *Journal of Popular Culture*, 17, 61-66.
- Kappes, B.M. and Thompson, D.L. (1985). Biofeedback vs. Video Games: Effects on Impulsivity, Locus of Control and Self-Concept with Incarcerated Juveniles. *Journal of Clinical Psychology*, 41 (5), 698-706.

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- Lin, S. & Lepper, M.R. (1987). Correlates of children's usage of video games and computers. *Journal of Applied Social Psychology*, 17 (1), 72-93.
- Loftus, G.R. & Loftus, E.F. (1983). *Mind at Play*. New York: Basic Books.
- Lowery, B.R. & Kirk, F.G. (1982). Micro-computer Video Games and Spatial Visualization Acquisition. *Journal of Educational Technology Systems*, 11 (2), 155-166.
- Malone, T.W. (1981, December). What Makes Computer Games Fun? *Byte* pp. 258-277.
- (1981). Toward a Theory of Intrinsically Motivating Instruction. *Cognitive Science*, 4, 333-369.
- McClure, R.F. & Meard, F.G. (1984). Video game players: Personality characteristics and demographic variables. *Psychological Reports*, 55, 271-276.
- Mehrabian, A. & Wixem, W.I. (1986). Preferences for individual video games as a function of their emotional effects on players. *Journal of Applied Social Psychology*, 16, 3-15.
- Melancon, J.G. & Thompson, B. (1985). Selected correlates of computer arcade game play. *Perceptual & Motor Skills*, 62, 1123-1129.
- Morlock, H., Yando, T., & Nigolean, K. (1985). Motivation of video game players. *Psychological Reports*, 57, 247-250.
- Myers, D. (1984). The Patterns of Player-Game Relationships. *Simulation & Games*, 15 (2), 159-185.
- Navas, D. (1985, March). Is It Fiction? *Popular Computing*, p. 182.
- Nelson, T.M. & Carlson, D.R. (1985). Determining factors in choice of arcade games and their consequences upon young male players. *Journal of Applied Social Psychology*, 15 (2), 124-139.
- Newcomb, H. (1982). Toward A Television Aesthetic. In Newcomb, H. (Ed.), *Television: The Critical View* (pp. 478-489). New York: Oxford University Press.
- Niesz, A.J. and Holland, N.N. (1984). Interactive Fiction. *Critical Inquiry* 11, 110-129.
- Paisley, W. & Chen, M. (1984). The second electronic revolution: The computer and children. In R.N. Bostrom (Ed.), *Communication Yearbook 8* (pp. 106-137). Beverly Hills: Sage Publications.
- Panelas, T. (1983). Adolescents and video games: consumption of leisure and the social construction of the peer group. *Youth & Society*, 15 (10), 51-65.
- Price, J.A. (1985). Social Science Research on Video Games. *Journal of Popular Culture*, 18, 111-125.
- Rice, R. (1984). *The New Media*. Beverly Hills: Sage Publications.
- Rogers, M. (1985, December 9). Software for War, or Peace. *Newsweek*, pp. 80, 82.
- Selnow, G.W. (1984). Playing videogames: The electronic friend. *Journal of Communication*, 34 (2), 148-156.
- Strein, W. and Kachman, W. (1984) Effects of Computer Games on Young Children's Cooperative Behavior: An Exploratory Study. *Journal of Research and Development in Education*, 18 (1), 40-43.
- Surrey, D. (1982). "It's, like, good training for life." *Natural History*, 91, 71-83.
- Wigand, R.T., Borstelmann, S.E., & Boster, F.G. (1985). Electronic Leisure: Video Game Usage and the Communication Climate of Video Arcades. *Communication Yearbook 9*, 275-293.

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