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Screw the Grue: Mediality, Metalepsis, Recapture

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I begin with an assertion that I consider an axiom of videogame studies. *Gameplay is the expression of combinations of definite semiotic elements in specific relations to equally definite technical elements.* The semiotic plane of a game's expression draws on the full range of common cultural material available to game designers and players: shared myth, conventions of genre and narrative form, comprehension of the relevant intertextual canons, etc. The technical plane of the expression - computational, electronic and mechanical systems that support game play - is the more restricted. Its elements are localized to a given situation of play (this software, this hardware) in ways that the semiotic elements of play seem not to be (Where do relevant cultural myth and the intertextual canon start and stop? Will this not vary according to the competence of the player?) . Moreover, because the technical elements of play should demonstrate the consistency and stability fundamental to usable computing devices, they are deterministic and capable of only finitely many configurations. (For the present and the foreseeable future, we play in Turing's world.) The challenge of game design is to program the *entanglement* of semiotic and technical elements in an interesting and rewarding way. The expression of play activates this entanglement in well-defined and predictable combinations.

The cultural-semiotic repertoire of videogame play can be measured, though the extent to which this could be limited to the videogame, strictly speaking, is doubtful. Games are rich cultural texts, drawing on symbolic domains well outside of a conjectured gameworld or a collection of user responses; an anthropology of gaming must reach beyond the material contexts of a specific episode of play.

My focus in this article is on the technical end of entanglement and the points of contact between technical and semiotic elements of play. Though intuitively the player must imagine that some contact is necessary - the game's interface must engage the underlying game engine, which must engage the computer's operating system, and so on - the relation between a given technical element or elements and traits of the gameworld will not always be expressed in ways that are significant *for the player*, whose attention is, for the most part, on events and existents of the gameworld. Some technical elements may seem to have no effect on the game's expression; their influences, if any, can only be conjectured. (For instance, how is playing a text-based adventure game created for circa-1980 computers different from playing the same game on a 2007 computer with vastly more memory and a many-times faster processor, when this seems not to change behaviours of the game's parser in any meaningful way?) Other elements will have determinate effects that are evident to anyone who plays or observes a game. Playing a first-person-shooter (FPS) such as *Doom* on an under-equipped system is very unlike playing it on one with a souped-up videocard and a faster processor. Yet others have effects that are no less determinate but which are only indirectly marked, whose contribution to play depends in a very real sense on their not being recognized by the player. I will describe several of these below. It is precisely in the fundamental role of constraints - play is freedom within defined systems of constraints - that videogames merit being called *games* in the first place. But videogames represent a particular variant of the freedom-within-constraints model of play proposed by theorists such as Huizinga and Caillois, in that rules and objects that define characteristics of the gameworld are bound to states of hardware and software that have no direct correlates in other forms of play. We may say that specific aggregates of hardware and software occurring together and in relation to the semiotic plane of the game's expression constitute its particular *medial* bases - that is, the complete character of its encoding in the medium of the videogame.

In an obvious way, medial determinisms of a videogame's expression will be marked in boundaries of its computational and mechanical elements. Monitors, keyboards, mice,

game controllers, etc. are capable of limited numbers of discrete electromechanical states; their affordances are constrained by the granularity of their operations. Hardware bottlenecks related to computer and video memory, processor speed, available disk storage, the latency of read-only media and network throughput enforce upper limits on computational efficiency. Play is subject also to contingencies of its performance: keys jam, controllers fail, hard disks crash, network communications are interrupted. Program or operating system bugs that were irrelevant to one round of play may plague others or bring them to a halt. The limits of a player's abilities may be caught up in these infelicities, as fatigue, clumsiness or unfamiliarity will compound effects of any design flaw or device error. Our auxiliary organs, as Freud observed, have not grown on to us well; they give us much trouble at times.

More subtly, medial determinisms will be marked - of necessity - in related structures of the program and the gameworld. In these cases, a structure in the gameworld or a pattern of play corresponds in a direct way to an underlying attribute of the program, representing it to the player in a form that is appropriate to the world and masks the technical requirement that it fulfils. Common threshold structures of the world - closed doors or windows, elevators, magical portals - often fulfil this dual function. Segmenting spaces of the world in a way that is easily accepted by the player, they may also mask computational latencies (the rendering engine must be given time to catch up, a new portion of code must be loaded into memory) or limits of the game's database (transporting her avatar to a new "level," an elevator also redirects the player's attention away from the fact that there is no inter-level space beyond the elevator's compartment, as nothing there is computationally-defined). Crucially, the threshold matches the program trait to the gameworld trait concurrently, or with such close approximation that their difference is not noticed much.

In this and similar moments of play, the user's attention is primarily on the gameworld rather than its software and hardware correlates; there is entanglement, but its expression tends toward a reification of one plane of gameplay. We may say that by some mechanism, which may vary from game to game and in the degree of its openness, the gameworld *recaptures* traits of hardware or software, repurposing them to its own ends and masking their potential disruption of the world with information that is notionally distinct from it. The back-directed orientation implicit in the term *"recapture"* is appropriate to the concept because, as I understand it, recapture takes place on the cusp of a sort of crisis in representation: exactly at the moment where entanglement threatens to bring forward the game's determinism by its definite technical situation, that determinism is turned back into the gameworld, so as to seem to be another of its (arbitrary but consistent) rules. Recapture is on the one hand a fundamental operation of videogame expression; it is hard to see how lines of code and a box full of hardware could seem to constitute a world without it. On the other hand, it will be specifically marked when technical elements of play are particularly troublesome to the designer or the game is for that reason or another unusually self-conscious of its medial conditions.

I describe below three examples of recapture in videogames of the 1980s and 1990s. Each was designed to run under hardware and software that were by early twenty-first century standards much constrained. *Zork 1* was developed for Infocom's Z-machine interpreters for 1980s personal computers with less than 48K of RAM (Blank, 1980; Montfort, 2003); *Virtual Valerie* was developed in an early version of Macromedia Director, for versions of the Mac OS lacking protected memory; *Bad Mojo* was developed for the 8-bit color displays and low-speed CD-ROMs typical of late-1990s desktop systems. The phenomenon of recapture will not be restricted to constrained hardware and software environments; it will occur in any definite medial object that articulates a fictional world. It is likely, however, that operations of recapture will be more clearly traced in constrained conditions such as these. Game developers working in them must attend to the meagre resources at their disposal; their solutions to technical challenges are often both plainly evident and cannily crafted. In contrast, developers working with comparably unlimited hardware and software are more free to be profligate in their uses of resources. In that circumstance, the player is likely to miss effects of recapture altogether, or to mistake them for arbitrary rules of form, such as genre conventions, rather than fundamental conditions of play. A salutary consequence of the backward glance: the seeming clunkiness of older games, seen from the present, demonstrates to us aspects of the gaming situation that the panache of contemporary

games often obscures.

Screw the Grue

Figure 1. *Zork 1: The Great Underground Empire* {Attic}. Shown here is a Z-Machine interpreter for Mac OS 9. Image and text © Infocom, Inc.

The player of Infocom's 1982 text adventure game, *Zork: The Great Underground Empire* (Figure 1) is free to wander in the many "twisty little passages" above and below ground, and to interact with objects and creatures she encounters there, but at the risk of her confusion or peril [1]. Some objects are inscrutable; some are dangerous; even when the creatures are not menacing (and most are), they rarely have her best interests in mind. Her fate in the gameworld is largely determined by her responses to *Zork's* text parser, which presents her with a brief description of an object or a scene, after which she types a command in reply, after which the parser gives a little more information and so on [2]. The goal of the game is to collect a series of "trophies" scattered throughout the labyrinths of the Great Underground Empire while fending off attackers and making use of some objects (a lantern, a box of matches, a screwdriver and so on) to solve the game's puzzles.

Among the player's adversaries is the grue, "a sinister lurking presence" whose "favorite diet is adventurers" and who is likely to show up whenever the player's avatar enters an unlit space. "No grue has ever been seen by light of day," the parser observes, "and few have survived its fearsome jaws to tell the tale" [3]. The grue's dual narrative and technical function is obvious: to force the avatar to return to the light or find a way of illuminating the dark; a menacing grue frees the game's designers from the practical burden of representing movements in total darkness in a text-only interface. When confronted by a grue, one should flee or turn a light on it; otherwise, one will be eaten and the game will come to an end. The grue is therefore a thing for which one should show some respect.

Figure 1 records my attempt to disrespect the grue. Upon being warned that I may be eaten, I type the respone "Screw the grue." I mean by this, of course, to insult the grue, but the parser duly attempts to make sense of my command in other terms. A screwdriver is an important tool in *Zork* and the player's avatar will often have one in her possession; screwing is something you do to a screw with a screwdriver. *Screwing* a grue, however, is ill-advised or impossible, as there's no likely place on a grue to insert a screwdriver and the creatures are, in general, intolerant of being messed with. In point of fact, my figurative use of the verb "screw" has no meaning in the game's lexicon, and so the parser replies that it doesn't grasp my intention. "You used the word 'screw,'" it complains, "in a way I don't understand." By way of explanation, I clarify my disregard for the grue more directly: "Fuck the grue," I reply. Now the parser shows more understanding of my intent: "What a loony!" it exclaims.

Under the circumstances, this may be a reasonable estimate of my lack of decorum or anatomical probity and, given the parser's famous literal-mindedness, I shouldn't be surprised that it rejects forms of abuse that it determines extreme. Yet, I find this exchange intriguing on two counts. First, the intended audience of the parser's expressions of confusion and then dismay is, I think, ambiguous. Like other responses it makes in the course of gameplay, its replies are putatively directed to my avatar. But they appear in this case to carry meaning beyond that relation, albeit confined to the

gameworld. The grue menaces; the game will end prematurely if I don't get my avatar out of the dark. But I've used up a turn spewing insults - in effect, rejecting the contract of the game and the good will of the parser. For this I am judged a loony - to whom is this assessment of my mental state addressed? - not because I've behaved stupidly - you can't screw a grue - but because I've behaved badly, I've *played badly*: you shouldn't try to *fuck* with a grue either, and to do so is simply crazy. The game's designers have anticipated that querulous players might resort to typing insults, and so they've built into the game an ability to distinguish between valid commands (you can screw several things in *Zork*, so long as they take a screwdriver) and invective (you can't fuck anything in *Zork*) [4]. Misbehaviour of this kind will be rejected and may result in your avatar being placed in peril by you fooling around - which seems strangely prim, given that the parser will not object to my commanding the avatar to kill itself by jumping off a cliff or stabbing itself with a rusty knife. (Which is why the "loony" appraisal must be directed to me, as those behaviours are arguably crazier than insulting or attempting to copulate with an invisible monster.)

Second, the parser's replies in this exchange illustrate a limit to what I can accomplish in the world of *Zork*. I've undertaken two turns in a row to do something is impossible or forbidden, and *have been warned of this in a way that is consistent with normal operations of the game*. There's nothing unusual about that; the parser works in exactly that way all the time, in that it tries to make sense of your input in terms of its very restricted vocabulary. But that's just the lesson of this episode: back-end limits of the game's database (in which movement in the dark cannot be represented and certain verbs are undefined in relation to grues) are handled during play in ways that conform to established rules of the gameworld. Some of those rules concern the physics of the world, and some seem to be about that and perhaps something else. What remains unclear afterwards (when I am dead, the victim of my own churlishness) is the degree to which the conformity of the parser's replies to these limits may also signal some permeability of the boundaries between the gameworld and the situation of play. The first reply tells me, in effect, that the parser doesn't know what I'm talking about, which is not the same thing as reporting that my input is in error. (Compare its "in a way I don't understand" to something like, "ERROR: That verb is not defined in the game database.") The second reply tells me that the parser understands me - though it may not distinguish between a figurative and a literal action - *but it won't let me play that way* [5].

Valerie's Question

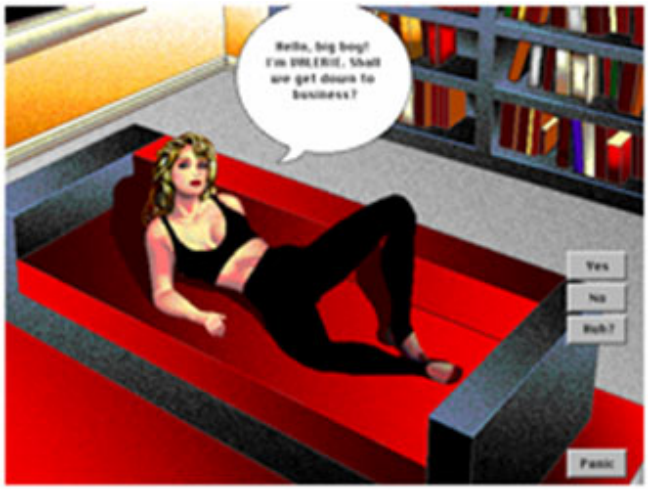

Figure 2. *Virtual Valerie*. Image ©1990 Reactor, Inc.

This is *Virtual Valerie* (Reactor, 1990; Figure 2). I've written elsewhere on Mike Saenz's notorious 1990 "interactive erotica" for Macintosh; I won't revisit that analysis here (Harpold, 2000). However, this moment in *Valerie* seems to me to merit another look, as some aspects of it are akin to my exchange with the *Zork* parser.

The principal aim of *Virtual Valerie*, as one might surmise from her invitation, is to "get down to business" with the game's eponymous heroine. The player is free to wander the cartoonish corridors and rooms of Valerie's apartment, to open and close her

cabinets and closets, examine the pictures on her walls and the books on her shelves, to view titles in her laserdisc collection - including, intriguingly, an abbreviated version of *Virtual Valerie* - and so on, but he (the player's avatar is male) will eventually meet up with Valerie in the position shown here [6]. If you respond to her invitation by clicking on the "Yes" button, you and she are transported immediately - no time is wasted showing the way - to her bedroom, where she enthusiastically submits to more involved advances. (Cartoon sex, limited to crudely-animated play with sex toys and predictable responses on her part. *Valerie* considerably predates the full-motion video FPS interfaces typical of later interactive adult titles.) More than this possibly tempting opportunity hangs on your choice: if you reject Valerie's invitation and click on the "No" or "Huh?" buttons, *your computer will reboot*. No advance warning is given: the game was written in Macromedia Director, and your misplaced mouseclick simply invokes Director's rarely-used "Restart" command. In 1990, there was good reason to avoid it, as the Mac OS had limited support for multitasking and no memory protection; any application - including the operating system - open at the time you made the wrong choice was at risk of being damaged by *Valerie's* sudden exit. "The forced reboots," Saenz explains, "were my method of punishing the player for 'trespasses.' I tried to imagine how Valerie might slap the player's face, and a reboot was the closest approximation I could come up with" (Private correspondence, 1994). It is to my knowledge the only showstopper of its kind in modern computer gaming.

As in my uncouth encounter with the grue, this moment of *Valerie* entangles technical and representational registers in such a way that each naturalizes the others. Also as in *Zork*, the consistency of the gameworld - the interactivity of objects in Valerie's apartment, her response to the player's choice - is subtended by an implicit contract: one plays by the rules… or one does not play, by the rules. But the force with which the contract is enforced in this case is obviously more extreme. My bad behaviour results in a program response that transgresses with shocking effect registers of play that we might reasonably expect would be distinct. This is the more ironic, as *Valerie* is unapologetic pornography; transgressive effects are anticipated in merely beginning the game [7].

Saenz has given us all the information we need to understand the seriousness of our endeavour in the on-screen buttons that represent the possible choices in this scene. They compel us to show some respect for limits of the gameworld - is that heavy breathing the sound of an approaching grue? - by frankly marking their technical bases. Strictly speaking, the buttons shouldn't be here; they belong to, they address, another place. Everything else in Valerie's apartment resembles what you might expect there: stylish furnishings, books, vases, hanging pictures, a stereo and TV, telephones, light switches. The buttons, in contrast, seem to reside somewhere between the surfaces of the apartment and the inside of the computer screen; they are, manifestly, *buttons*, bevelled edges, Chicago font and the rest [8]. In that, they figure a more radical laying bare of the gameworld's dependence on its mediality [9] than *Zork* could ever manage, because the Z-machine has no comparable connection to basic functions of the operating system [10]. Recapture is more effective in *Valerie* because it implicitly accounts for its own mediality: rejection of Valerie = system reboot = rejection by Valerie; this unexpected disruption translates the pleasure forecast by her offer into a display of its precariousness. If we conclude on second or third try that the reboot is meant to be a parodic infraction of the conventions of play, its force is such that it resituates the expressive potential of the game so as to include the address of the real conditions of play.

Narrative theorists refer to level transgressions such as these as *metalepses*. As first described by Gérard Genette (1980, 1988), a metalepsis occurs when the ostensible boundary between two narrative worlds is breached, as when in Joseph Conrad's novel *Heart of Darkness* Marlow interrupts his account of his voyage up the Congo river to converse with his audience, who are seated on the deck of a ship anchored in the Thames river long after Marlow has returned from Africa; when the Balzacian narrator pauses to alert the reader to facts about a scene that are not evident from its plot or dialogue (Genette, 1980, pp. 134-35); or when the narrator of John Fowles's *The French Lieutenant's Woman* observes in passing that the characters of the novel "never existed outside my own mind" (Ryan, 2006, p. 207). As is particularly clear in the examples of Balzac and Fowles, metalepses may draw attention to the fact that a story is being narrated *by someone*, signalling thus her control over elements of the

narrative regardless of its appearing to be an account of things-that-really-happened [11]. Such intrusions may be so extreme or numerous that her control is shown itself to be subject to further levels of control and these to others, etc. Laurence Sterne's *The Life and Opinions of Tristram Shandy, Gentleman* is a model case - belying the notion that these distinctions can be made with much confidence.

Metalepses may be also effected from the domain of the embedded narrative outward, as in fictions that "break the fourth wall" when a character directly addresses her audience *as* an audience, that is, as conjectural (for her) beings who observe events of the narrative from an external vantage point. Such moments are almost always openly ironic: that is, they suggest that a character is aware that she is an agent operating for the moment in a fictional world - "*this* isn't real, it's only a charade; *you and I*, on the other hand, *are* real"- showing in this a degree of self-awareness that should be impossible. These turnabouts may be disturbing to the spectator precisely in that they subvert her presumption that her self-awareness is of a superior nature (Bertolt Brecht's "theatre of alienation" relies on this effect).

The scope and kind of metalepses are as varied as the literatures in which conditions of narration are textually marked; that is to say, pretty much every text in which we may detect the barest hint of self-awareness. That is, to be sure a typical characteristic of twentieth- and twenty-first-century narrative arts, and print fiction, film and new media of the last century abound in examples of level transgressions [12]. In part for this reason, the degree to which the transgressions must be considered deliberate (again, Sterne represents a model) has been questioned by some critics. Wagner (2002), for example, has proposed that some metalepses, rather than being calculated manipulations of narrative conventions, may be evidence of historical and technical shifts in literary method or genre, in which at least some acknowledgement of the conditions of narration is normal rather than exceptional. Genette, who earlier stressed the role of metalepsis as a barometer of narratorial control, has recently (2004) described it as a sign of the "fictionality" of some literary objects, on which basis we detect their difference from those objects that purport to merely show us our world as it is.

This last emphasis, on metalepsis's marking of fictionality by disrupting narrative form, seems to me a useful point of departure for understanding the significance of medial recapture in videogames. Level transgressions, when they are accompanied by evidence of the gameworld's technical bases (*Zork*), or when those bases are forcefully marked (*Valerie*), are the plainest signals of entanglement. Metalepsis, in classical terms, is a purely narrative structure; it may be described without regard for media because it is a trait of conjectural domains that are set apart by literary conventions. Classic (that is, structuralist) narratology insists on the separability of narrative form and medium (Chatman, 1978). But if level transgression should be enacted in such a way that the outermost boundary of the gameworld is breached and the world's rules extended to material conditions of play (*Zork* and *Valerie*, with different degrees of disruption), we confront a new turn on a familiar concept: metalepsis, whatever its degree of violence, must then have a medial basis [13]. Recapture domesticates or reorients the mediality of this sort of metalepsis by precisely extending rules of the gameworld outward. Or bringing the outside into the world. The difference is not insignificant, but the results are much the same.

"It was the roach!" [14]

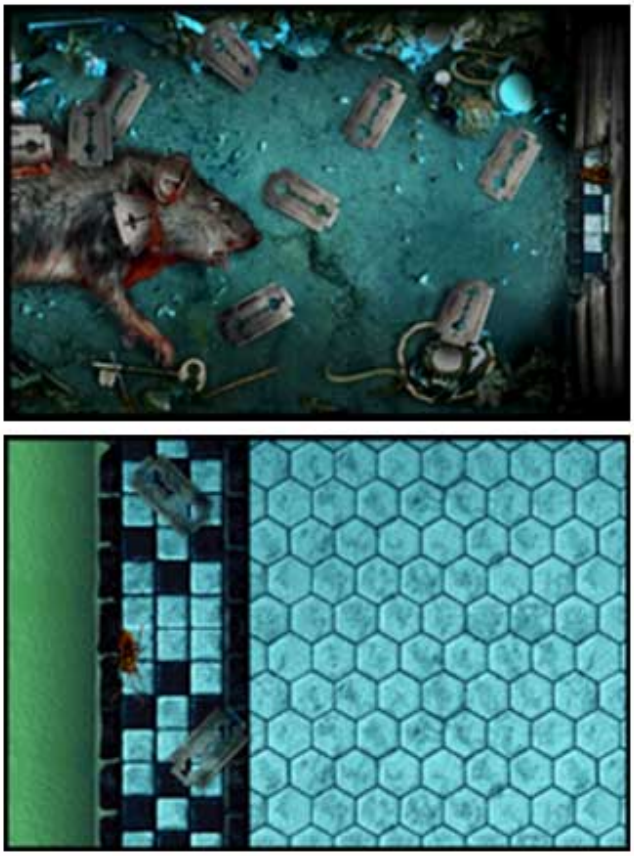

Figure 3. *Bad Mojo*. Images ©1996, 2004 Pulse Entertainment, Inc. and Got Game Entertainment, LLC.

A final example, less wrenching than the first two. These images (Figure 3) illustrate adjacent segments of the gameworld of Pulse Entertainment's *Bad Mojo* (1996, 2004) [15]. The image on the right shows a portion of the tiled bathroom floor of the seedy dockside bar in which the game takes place. On the left is the corresponding space behind the bathroom wall, occupied by a gruesome rat that the player's avatar, a cockroach, must kill in order to advance in the game. (As shown here, the roach has defeated the rat by pushing a pile of rusty razor blades from the edge of a wall stud behind the medicine cabinet onto the rat, guillotining it. The game's considerable popular and critical success was no doubt due in part to its unapologetic "yuck" factor.) The spaces are coloured in hues of blue, black and green (the tile, baseboard and floor of the rathole), brown, black and grey (the rat and the cockroach, the razor blades) and red (the rat's blood). The textures of the rat's fur and the bathroom floor are notably subtle, given that they are rendered using no more than 256 colours.

This is not unusual for computer games published in the last decade of the twentieth century, as most were designed for video subsystems capable of displaying potentially millions of colours but no more than 256 different colours at one time [16]. Working within such a constrained palette, a talented graphic artist may create surprisingly nuanced surface textures - *Bad Mojo* is a clear demonstration of this - but she will likely have to rely on different subsets of the available colour space ("colour lookup tables" or CLUTs) in order to capture the nuances of different surfaces of the gameworld [17]. As the number of such surfaces is multiplied within a scene, the difficulty of precisely rendering each increases, as more of the CLUT must be assigned to it, leaving fewer colours available for other textures. If the same object must appear in scenes requiring different CLUTs (for example, the player's avatar or something that it carries), the number of available colours will be further reduced, as those assigned to the object must be reserved for it. Scenes dominated by very different textures may require entirely different CLUTs, forcing a switch as one scene replaces another. This transition must be handled with finesse, as it can easily produce momentary distortions of the image such as posterizing and moiré effects [18].

Game designers in the 1980s and 1990s dealt with these challenges by limiting the

number of textures in scenes or basing them on overlapping subsets of similar CLUTs. When necessary, changes between CLUTs could be masked by carefully designed transitions within the gameworld. Jordan Mechner's celebrated murder mystery *The Last Express* (1997) used a rotoscoping technique to simplify the appearance of human actors, preserving much of the available palette for the ornate interiors of the Orient Express, on which most of the game takes place. Restricting avatars' movements to the explicitly closed and segmented space of the train freed designers from having to depict a more varied world (only one compartment or corridor is visible at a time, landscapes seen through the train's windows appears mostly as green and brown blurs). It allowed them, moreover, to introduce threshold structures - darkened platforms between train cars, doors, curtains - beyond which a change in the CLUT was made, a form appropriate to the spatial logic of the gameworld. Players passing from a car dominated by one set of textures to a car dominated by a different set were stopped for a brief moment at their intersection, during which time the CLUT shifted.

The designers of *Bad Mojo* conceived of their game as a sequence of still images representing adjacent segments of the gameworld ("islands of activity"), traversed by a small avatar with a limited range of motion: a cockroach, "driven" by the player over surfaces of a seedy dockyard bar (Figure 3). During play, the segments are switched in and out integrally, as the roach crawls over the edge of one into the next. It appears free to move in any compass direction - the player uses the arrow keys to direct it - but barriers in the world are often strategically placed to orient the player's exploration of the world. The roach can't crawl over liquids or through flames, for example, or leap over chasms. (It does a few times fall from a height and manages in one segment of the game to hitch a ride on the back of a moth.) The dominant textures of adjacent segments may vary slightly - crossing a floor or a wall involves repeating multiple segments that look much the same - or substantially; the only colours present in every scene are the handful of browns and reds reserved for the roach's body.

This patterning of the gameworld and the actions of the avatar are, in fact, direct analogues of the game's technical bases. The roach is the simplest animated sprite, requiring minimal visual detail or animation. Its limited abilities (it can crawl, it can push small things) provide the perfect alibi for severely restricting an avatar's affordances. The barriers it encounters in the gameworld suggest that there is more to the world than must actually be defined; it's just the case that a roach can't get to those places. The segments of the world, the plainest evidence of the game's data structure, correspond to units of its textbase loaded in and out of memory from the CD-ROM. According to the game's producer, *Bad Mojo* began with a set of technical solutions to performance bottlenecks of Windows 95 and Mac OS 7 - a simple sprite, a restricted gameworld, loading whole screens from from slow read-only media; its darkly comic, Kafkaesque story emerged from a design *based on the bottlenecks* [19].

We approach here what is at once the most radical and the most subtle dimension of entanglement and recapture. Where metalepses of the *Zork* or *Valerie* kinds alert us in a punctual way to the gameworld's dependence on its mediality (and vice-versa), that dependence in *Bad Mojo* is more generally marked, in that its effects appear largely unremarkable. That they can convince us that nothing much happened (the roach crawled over the edge of one space into another) when something quite significant in technical terms occurred (the game switched between discrete segments of its textbase), or convince us that there is more in the gameworld that meets the eye when there is, exactly, nothing more, demonstrates unequivocally that narrativity cannot be completely separated from mediality. Where narrative patterns leave off and technical patterns take up - the reverse is likely the more decisive direction of influence - is hard to measure. Finding their crossings may become harder as evolving hardware and software are more forgiving of their mutual limits. But we can be sure that the two patterns are at a basic level homologous, and that the playability and very likely the pleasures of a game will depend on the extent to which recapture can manage the expression of this homology. The craftiness of the best game design is that it achieves this in such a way that the player does not much notice it for the time during which it is taking place. (How often should she have to think of backend databases, OS-level functions and logical colour spaces *while playing?*) Semiotic elements and technical elements are specifically combined in the expression of a game (my initial axiom again); recapture moderates effects of combination, supplying thus their motives and their alibis. Which means, crucially, that while its potential operations may be

programmed in advance - that is the crux of the game-as-program - recapture happens during play, in the complex digressions and feedback loops that are activated in actual play.

The consequences of this are, I suspect, of considerable significance for game studies. A supposed antagonism of simulation and narration has distracted much of game studies for the better part of a decade. The enervating debates between ludologists and narratologists could be set aside by approaching disruptions between the simulated and the narrated at their medial intersections. In that context, I would argue, simulation would no longer be mistaken for a process in which mediality is irrelevant to play (the characterization of gameworlds as nascent Holodecks is the most naïve version of this model.) Instead, it could be understood as the game's moment-by-moment recapture of its technical elements, its way of seeming (for the player) to absolve itself of that contribution to the basic contingency of mediality. Narration is one of the primary operations by which this absolution is achieved within the semiotic plane of play, but is not (as the ludologists have shown) exhaustive of a game's expressivity; extra-narrative elements (mimesis, performance) may also come into force. Recapture opportunistically binds each to the technical plane of play and thereby to the others.

These, it seems to me, are stories we might play with for awhile.

Notes

[1]

Zork 1 is the first of five text adventure games set in the Zork universe, which has also generated two novels and three "choose your own adventure" books for young adults. Its enormous influence on subsequent game design is everywhere apparent. (For simplicity's sake, I do not distinguish in this article between "text adventure games," "interactive fictions" and "videogames," using in most cases the last term for all three categories of computer-based game.)

[2]

Here and below I follow terminology proposed by Montfort (2003, 26): "commands" are instructions by the player that should effect some change in the gameworld; "directives" effect changes related to operations of the program. Thus, in Zork, the verbs "take" and "open" ("take sceptre" "open bottle") are commands, and the verbs "save" and "restore," by which the player preserves the current state of the game or restores a saved state, are directives.

[3]

This observation is elicited by the player typing in the question, "What is a grue?" As Montfort observes (27), the question necessarily invokes a transgressive crossing. No one in the gameworld can know the answer - every adventurer who has met a grue presumably has been eaten - so the description of the grue relayed by the parser must be based on knowledge outside the gameworld, and can only be addressed to the player, not her avatar.

[4]

See Monkeon's "Profanity Adventures" for an amusing investigation of the responses of other text adventure games to obscene commands.

[5]

A friendly reminder of the correct method of play would be no less transgressive of the gameworld's boundaries. 'In one somewhat dramatic moment in Zork III, Blank and Lebling poked fun at the strict input requirements placed on users by computers, and in particular the Infocom parser's inability to understand typed input that would be clear to a human but might differ by a single character from what the computer would accept. When a player is near the end of her quest and has encountered the Dungeon Master at a door deep within the complex, the old figure says: 'When you feel you are ready, go to the secret door and 'SAY "FROTZ OZMOO"'! go now!" He starts to leave but turns back briefly and wags his finger in warning. "Do not forget the double quotes!"' (Montfort, 2003, p. 134).

[6]

In a curiously gruish scene that breaks with the game's FPS scheme, the player is able

at one point to see the avatar's obviously male shadow cast across the threshold of a door that opens into a darkened room. When the light switch is flipped on, the shadow disappears, and the avatar is nowhere to be seen.

[7]

The crashing response was removed from the second release of the game after many players reported it as a bug (Harpold, 2000). In Virtual Valerie, The Director's Cut, failing to follow Valerie to her bedroom results in the player being transported to the hallway outside her apartment, followed by her slamming the door shut. Any attempt to reenter the apartment prompts disparaging remarks from Valerie, heard through the door, regarding the player's sexual abilities. The only way to re-nter the apartment is to manually quit the game and relaunch it.

[8]

Chicago was the Mac OS system font designed by Susan Kare, who was also responsible for many graphic elements of the original Macintosh desktop. Between 1984 and 1997, Chicago was used throughout the Mac OS interface for text in menus, window titles, and buttons.

[9]

"Lay bare": compare the related concept of the Russian Formalists, who considered the text's "laying bare of its devices" [*obnazhenie priema*] the hallmark of its literariness. See Erlich, 1980, 192-97.

[10]

Classic Infocom text adventures such as Zork (and most contemporary interactive fictions) are run within a "Z-machine," a virtual machine capable of interpreting programs written in "Z-code," an especially compact object-oriented language for representing gameworld objects and operations and some system directives. Because Z-code is theoretically machine-independent, games programmed in it can be migrated to different operating systems, requiring only the creation of a Z-code interpreter for each system (Blank and Galley, 1980).

[11]

Genette (2004, pp. 20-22) describes several examples of metalepses pointing to the narrator's control of the " facts" of historical discourse in the writings of French historian Jules Michelet.

[12]

See Wikipedia's several articles on "the fourth wall" and "breaking the fourth wall," which, though typically heavy on recent pop-cultural examples and making few distinctions between practices specific to media, list scores of examples of this species of metalepsis in (print) fiction, film, television, theatre, videogames, comics, and so on.

[13]

This I take to be an implication of Ryan's description of metalepsis as a stack structure resembling the layers of virtual machines comprising the modern desktop computer. "The stratified architecture of the computer is not in itself metaleptic, no more than the narrative stack of The Arabian Nights, but it creates opportunities for metaleptic operations of a technological nature (viruses, programs that operate on themselves), as well as of manipulations that lead to ludic and artistic effects" (2006, pp. 217-18).

[14]

Roger Samms's insane refrain in the final cut-scene of one of four possible endings of Bad Mojo. Samms insists that his father's death in an accidental gas explosion was the fault of the roach "driven" by the player. Samms appears to have become mad as a consequence of having had his consciousness merged with that of a roach. But it is never in fact made clear that Samms became the roach, as the insect is always under the player's control. Samms's refrain marks a frank if subtle admission of metaleptic transgression: it was the player who brought about this end of the game.

[15]

The 2004 *Redux* release of the game differs from the first release in color depth, some full motion video sequences and a new "making of" documentary included with the

game CD-ROM. In the later release, game graphics were converted to 24-bit color and full-motion sequences were remastered at the higher bit depth.

[16]

Display subsystems of desktop computers store intensities of each of the primary colors (red, green, blue) used to produce the specific color of a screen pixel as 8-bit bytes, requiring thus three bytes of video memory for each pixel (24 bits, 3 x 2^8 = ~16.8 million different colors, substantially more than the 3 to 10 million different colors between which the human eye is capable of discriminating). In many modern systems, a fourth and sometimes a fifth byte (32-bit, 48-bit) are assigned to an "alpha channel" that specifies pixel translucency. Prior to the 1989 introduction of the Super VGA standard, most display systems used 6 or fewer bits for each pixel, limiting the number of different colors that might be displayed at one time to no more than 64 (2^6). 8-bit display systems, the baseline for most of the 1990s, used a single byte (8 bits) for each pixel, raising this limit to as many as 256 (2^8). On systems with limited video memory, the pixel resolution of the display device could also determine the available color space, that is, higher resolutions using more video memory would be limited to fewer colors. The technical bases of color display are in fact more complex than simply scaling bit depth or changing pixel resolution, as some video subsystems use special techniques to increase the apparent color space. For example, most modern LCD systems store only 6 bits of data for each of the three primary colors (18 bits, 3 x 2^6 = ~ 260,000 different colors), and use a technique called dithering to create the illusion that the logical color space is capable of "millions" of colors. This is because display processes that rapidly change the values of adjacent pixels, such as on-screen video playback, tend to show undesirable artifacts at higher bit depths.

[17]

A color lookup table matches numeric values specifying the color of each pixel to the levels of red, green, and blue displayed by the monitor. When the number of discrete values is fewer than the maximum number of different colors that may be theoretically displayed, the colors are said to be indexed to the CLUT. The term is generally reserved for CLUTs of 256 or fewer colors.

[18]

These effects may be desirable in some situations. Zach Whalen has brought to my attention the use of color lookup table cycling in some 4-bit color games to create certain visual effects and simple animations.

[19]

"How do you load these graphically-rich scenes and not have really long load times for the player?" Vinny Carrella, "The Making of Bad Mojo" (Pulse Entertainment, 2004).

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