The State of Play:
The Cultural Phenomenon of Interactive Gaming

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I hereby declare that this thesis has not been submitted, either in the same or different form, to this or any other University for a degree

Signature…….

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Summary: Research Aims

In writing this piece, my aim is an attempt to solidify some of the questions I have found myself asking when I have been thinking about games, or discussing them with other people. My intention is to explore what makes gaming significant as a cultural phenomenon and begin to examine the exponentially growing industry within the UK for the appeal it has offered to its gamers, and to consider some of the ways in which games are appropriated and used by consumers. As I hope to indicate within this piece, this is an industry which is growing globally and at an exponential rate – especially within Britain – many game design companies are expanding and hiring. Perhaps unsurprisingly, then, the majority of my research into games will concentrate on case studies and products that have been and are popular within Britain.

My intention is to try to create a blueprint for a way in which games can be approached and thought about. If film and literary analysis have such a solid 'language' upon which such analysis can take place – and games, to some extent mirror films – then what kind of 'language' would we use to begin to allow ourselves to understand – and analyse – what happens when we play games and the 'effect' of that 'play' as it is played out by a user? More importantly, I will address the question of 'what' gamers 'do' with games.

In order to answer these questions, I will address these issues in three sections: firstly, through 'theories': the first two chapters will address the development of a plausible route for theories on gaming through looking at early forms of analysis, such as formalism and structuralism. In the second chapter, I will explore *how* these early forms became integrated into the analysis of media forms – such as film – and offer some means for mapping, or adapting, these theories to suit interactive gaming forms.

The second section will consider 'spaces' and I will work through theories on the origins of perspective and into ways in which physical space has been 'adapted' and represented by artists over the past three centuries, from Post-Impressionism to contemporary forms of imaging. In the second chapter of this section, I will begin to explore theories of virtual – non physical – space and how these become both used and appropriated through film design, Computer Aided Design (CAD) and networked spaces. The third chapter will pick up theories outlined in the previous two chapters to begin examining the origins of 'game space': the creation of universes in code.

The final section will examine what I will call 'game forms'. Using contemporary game structures as case material, my intention is to consider how gamers use the resources they have to 'get the most' out of their games. Using the wealth of online information pertaining to new games, I will consider how these games are talked about, adapted and supported through the users themselves. Much of the first chapter will consider notions of 'affect': the emotional currency invested into these products. The second chapter will consider how games have been optimised (or adapted) for multiplayer scenarios. Most games now have routines coded into them to allow the

game to be used over networks. I will explore some of the ways in which these games are adapted and 'used' for online situations.

The rest of the thesis will set the parameters to frame a context for the current state of the industry. By doing so, I will continually examine the evolution of academic enquiry into this area through a 'mapping' of the current academic field.

The Nature of the Game: Growth of the Industry

In the UK alone, the leisure software industry is worth an approximated $3.5 billion, pitching it in front of the TV and film industries[1]. Of that percentage, statistics published by the European Leisure Software Publishers Association (ELSPA) in 2001 claimed that the joint sale of games and hardware[2] broke a record £1.6 billion[3]; they concluded that more was now spent on gaming than on going to the cinema or home video rental. Unsurprisingly, a recent report, appearing just after E3, the gaming industry's biggest annual expo, stated that the total revenue from games totalled $9.3 billion[4], outpacing Hollywood's box office total of $8.1 billion[5]. These figures – while admittedly vague – serve to demonstrate both the scale and the growth of this industry; demand for both software and consoles, ELSPA went on to suggest, had increased 36% on the previous year. The UK computer game market is now the third largest in the world, outstripped only by the US and Japan[6].

In fact, 2002 has seen an overall acceleration of take-up for broadband internet services within the UK[7] and while there is no strict correlation between the *potential* use of broadband and the growth of the gaming industry, it should be taken into consideration that almost all major title games to be released have multiplayer elements built into them. Certainly, the growth of broadband access, coupled with the increasing popularity of gaming, has led to the proliferation of dedicated online games such as Sony's *Everquest*[8] and Electronic Arts' *Ultima Online*[9]. Recent research published by DFC Intelligence[10], an interactive media research group, has concluded that by 2006, the number of people playing games online will have increased six-fold[11]. Many home computer games have popular followings online; these will be discussed in greater detail when I explore multiplayer gaming forms in chapter seven.

Of course, the growth of broadband internet access opens up much of the potential for the speculated increase in online gaming. Interactive entertainment forms such as gaming, will be considered a key component of bandwidth usage and ultimately serve to fuel further increase of subscriptions to digital services, although there is a growing sense that heightened access to increasingly digital content will benefit every sector of society, from home users to corporations; indeed, New Labour has made explicit their

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[1] *See :* <http://www.cric.ac.uk/cric/gamerz/> - although it is not specified exactly *what* constitutes 'leisure software'; could this, for example, also include cinema releases on the popular DVD format?
[2] They define this as 'games and consoles'; so it is unclear whether the home PC market would have sales included in this figure. I am working on the premise that they are *strictly* considering consoles.
[3] *See:* <http://www.elspa.com/mediapack/intro.html>
[4] Again: this figure is not explicit in relation to the area covered. As E3 is an expo based in the US, I am working on the premise that the numbers apply *only* to sales derived in within North America.
[5] *Source:* <http://www.usatoday.com/life/cyber/tech/review/2002/5/23/e3.htm>
[6] *See:* <http://news.bbc.co.uk/hi/english/entertainment/new_media/newsid_1752000/1752522.stm>
[7] *See:* <http://news.bbc.co.uk/hi/english/sci/tech/newsid_1755000/1755343.stm> *and* <http://news.bbc.co.uk/hi/english/business/newsid_1717000/1717433.stm>
[8] *See:* <http://everquest.station.sony.com/>
[9] *See:* <http://www.uo.com/>
[10] *See:* <http://www.dfcint.com/>
[11] *See also:* <http://www.ispreview.co.uk/cgi-bin/ispnews/printnews.cgi?newsid1023457528,85446,>

vision of 'broadband Britain'[12], in which MP Patricia Hewitt[13] has pledged that by 2005, the UK will harbour 'the most extensive and competitive'[14] broadband market of the G7 countries, ensuring availability of digital broadband access to all parts of the nation. Whether they manage to reach such an ambitious target is subject to debate; but primarily, a key consideration is that the government and British industries - and finally, consumers - stand to benefit from the proliferation of high-speed digital services. The broadband 'boom' fuels the growth in development of content and services, which in turn fuels employment, which fuels more services for consumers – and so on.

Although several warnings have already been cast regarding Britain's digital future: initially, questions were prompted regarding the sale of five 3G licences in 2000, raising the government £22.5 billion[15], whilst confirming the spiralling future for high-bandwidth services for consumers. The collapse of ITV digital in May 2002[16], which left 1.2 million viewers with nothing more than a blank screen and a useless box, with no intervention from the government[17] and the clear and present monopoly owned by BT over all 'telephone based' broadband options for consumers within the UK[18] all suggest that the path towards attaining their vision will not be an easy one. Although £30 million has been provided by the government in order to help 'wire up' areas with limited access[19], and a £3 million marketing campaign launched in December 2001[20] was launched to state the government's intentions, there is possibly a feeling that a key motive of getting Britain 'wired' surely will rest on their hope of being able to sell off all the analogue bandwidth for a veritable 'bomb'[21].

As home networking technologies become more popular[22] and newer operating systems optimised for faster motion graphics, such as Windows XP (Microsoft) and OSX (Apple) series enter the market - coupled with a proliferation of new gaming consoles which allow for networked gaming using an internet connection - it would

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[12] The government's plans and publications can all be found from <http://www.e-envoy.gov.uk/>
[13] *See:* <http://www.patriciahewitt.labour.co.uk/>
[14] *Cited in:* <http://news.independent.co.uk/digital/features/story.jsp?story=282266>. An excellent article explaining the government's current thinking: an approach dubbed the 'Heineken Strategy' by Patricia Hewitt, can be found at <http://news.zdnet.co.uk/story/0,,s2084406,00.html>
[15] *See:* <http://www.electronicstimes.com/story/OEG20020503S0024> *and* <http://www.vnunet.com/News/1103271>
[16] *See:* <http://media.guardian.co.uk/itvdigital/story/0,11829,736943,00.html> <http://www.guardian.co.uk/uk_news/story/0,3604,707938,00.html>
[17] *See:* <http://media.guardian.co.uk/city/story/0,7497,688910,00.html>
[18] *See:* <http://www.theregister.co.uk/content/22/25358.html> *and* <http://www.guardian.co.uk/internetnews/story/0,7369,719364,00.html>
[19] <http://news.bbc.co.uk/hi/english/sci/tech/newsid_1791000/1791927.stm> for examples of how this is being realised, *see:* <http://news.bbc.co.uk/hi/english/sci/tech/newsid_1931000/1931217.stm> *and* <http://news.bbc.co.uk/hi/english/sci/tech/newsid_1777000/1777972.stm>
[20] <http://news.bbc.co.uk/hi/english/business/newsid_1689000/1689929.stm>
[21] Their analogue television bandwidth – 48 frequencies in all – is currently used for the hosting of the five terrestrial TV channels within the UK. When digital reception is standard, these become 'spare' and the government could stand to make between £8 to £10 billion from selling both the apparatus and the wavespace. *See:* <http://news.bbc.co.uk/hi/english/uk/newsid_449000/449849.stm> *and* <http://news.bbc.co.uk/hi/english/sci/tech/newsid_450000/450313.stm>
[22] <http://news.bbc.co.uk/hi/english/sci/tech/newsid_1869000/1869151.stm>

seem that the time for gamers has indeed come. As an academic discipline however, the *study* of leisure software – or, as I prefer: forms of *interactive gaming* – remains a reasonably fresh area in comparison to other cultural forms such as TV or film. The academic field – and the current thinking on games and interactivity – are aspects which I shall examine more closely later in this introductory chapter and explore further in chapter two.

Over the past twenty years, the UK has frequently been renowned for its innovation and originality within the sphere of game development[23]. At the beginning of 2002, *The Times* claimed there were more than 300 games development companies in practice (*Culture*, 6/1/02:49), developing for all the major contending platforms such as Sony's *PlayStation 2* console[24]; Microsoft's *X-Box*[25]; Nintendo's *Game Cube*[26] and the Macintosh, Linux and Windows based platforms for the Personal Computer (PC) market.

It has been suggested that almost three quarters of people under thirty (within the UK) have played a computer game and of these, half play games on a regular basis[27]. It is becoming commonplace for games to have development costs exceeding £1 million; financially placing them on par with many low-budget European film releases. The BAFTA award winning[28] *Black and White* (Lionhead Studios, 2001) cost £4 million to make[29] and as gamers' expectations rise, hardware increases in both speed and capacity in unison with the *scope* of the complexity and functionality encoded into the games by the software houses, mean that development costs seem likely to increase. Increased game development costs will have significant effects: firstly, games themselves are set to increase steadily and predictably in price; consequently users (or players) will want to take less risks with one-off game purchases and – in the majority of cases – will most likely only buy within a select range of games, being those owned by their friends, or those which either 'score' highly in reviews, or exist as part of a 'successful' series of game[30]. As such, successful formulae or 'game genres' have been developed and re-hashed, either in their own right, or as conversions of successful films or stories[31].

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[23] *See*: Collins, B. and Garratt, P. (2002:49). This view was also reinforced by Tony Blair, back in July 1997, when he published an article in *The Guardian* called 'Britain Can Remake it' which listed Bullfrog, a leading UK game developer, as exemplary of demonstrating the 'breadth of British product design'; *see:* <http://www.bullfrog.co.uk/uk/html/Frameset_files/info.html> and <http://www.wired.com/news/print/0,1294,39359,00.html>

[24] *See:* <http://www.ps2home.co.uk/ps2_games_developer_list.htm>

[25] *See:* <http://www.gamespot.co.uk/stories/news/0,2160,2031357,00.html> *and* <http://www.xbox.com/uk/Games/catalog.htm>

[26] *See:* <http://www.nintendo.com/games/master_list_result.jsp?system_id=9>, <http://www.gamecubeuk.net/> *and* <http://www.gamesdomain.com/news/7502.html>

[27] *See:* <http://www.cric.ac.uk/cric/gamerz/>

[28] For Music and Interface Design; *see*: <http://www.bafta.org/5_ie/5_WINNERS.htm#arts>; *Black and White* also won 3 EMMA awards: <http://www.emma-foundation.org/2001winners/winners.html>

[29] *See:* <http://www.gamasutra.com/features/20010613/molyneux_pfv.htm>

[30] For example: Cyan Software's *Myst*, *Riven*, and *Myst III: Exile*; or DMA's *Grand Theft Auto* trilogy.

[31] A recent look at the Electronic Arts itinerary <http://www.ea.com/> reveals licences for *James Bond 007: Nightfire*, American McGee's *Alice* and *Harry Potter and the Sorcerers Stone*

This could mean that publishers will ultimately take *less* risk over what they agree to licence, sticking to fixed game blueprints and business models in order to maximise profit and minimise losses. Also, in the event of corporate giants such as Sony and Microsoft all vying for competition within the console landscape, a demonstrable shift has occurred in *how* the gaming market has been viewed: an area enriched by heavy investment and budgets getting ever closer to those of the film industries within the US and worldwide. Indeed, working from statistics published by the Interactive Digital Software Association in 1998[32], Stephen Poole confirms what Sony had also realised when they launched their highly successful[33] console: that the 'average age of videogame players is now estimated to be twenty-one (…) 63 per cent (…) are over eighteen (…) 29 per cent (…) are thirty six years of age or older' (2000:20). So games increase in price and cost more to develop; as game players (like Poole himself) grow older, the market for gamers changes to reflect these changes. Sony was quite specific about how they should market their console[34] and they got it right. The outcome of years of research into hardware and software development has led to the creation of increasingly more intricate and detailed games. This, linked to an ageing demographic for gamers – has led to the rise of production of games with more 'mature' or 'adult' content. More graphic and 'adult' content has lead to the formation of organisations like the Entertainment Software Ratings Board (ESRB)[35], whose purpose is to monitor and classify game content according to target audiences; essentially they are a consumer watchdog for the industry, working much like the British Board of Film Classification (BBFC)[36] within the UK. In sum, over the past twenty years, game development has moved from the level of a number of small 'cottage' companies to a chain of big entertainment companies owning a range of smaller production houses, a similar model to what we take for granted within the film and music industries.

Interestingly, the increase in the prices of games has been met by rigorous 'price slashing' on consoles by the 'big three': Nintendo, Sony and Microsoft. As all are competing globally for the lion's share of the console market, all viciously work to outbid the other in terms of price: Nintendo's *Game Cube* seems to be the current cheapest console available[37], selling at £129.00 (*Source:* Dixons.co.uk 17/06/02); Sony's *PlayStation 2* £193.46[38] (*Ibid.*); Microsoft's *X-Box*[39] £194.95 (*Ibid.*), meaning – certainly in the case of Microsoft – that they are selling units at a distinct loss around the world. Although the games for these consoles currently range from

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[32] Full - and detailed – statistics and analysis of their highly extensive consumer research can be found online at: <http://www.idsa.com/releases/consumer.html>

[33] As Poole (2000) explains, an estimated '1 in 5 households in the UK has a *PlayStation*; worldwide sales of its console have topped 70 million' (2000: Back Cover). For an indication of sales of the *PlayStation 2*, see <http://www.scei.co.jp/corporate/release/pdf/020109e.pdf>

[34] For an idea of where Sony 'filled a niche', listed information reflects the demographic groups different consoles are aimed at: <http://computers.sympatico.ca/viewz/guides/consoleprint.htm>

[35] *See:* <http://www.esrb.org/>

[36] The British Board of Film Classification <http://www.bbfc.co.uk>

[37] *See:* <http://www.afterdawn.com/news/archive/2846.cfm>

[38] *See:* <http://www.idg.net/idgns/2001/06/29/SonyCutsPriceOnPlayStation2.shtml>

[39] Microsoft's console has effectively seen a 50% reduction in price since its first European release: <http://www.afterdawn.com/news/archive/2831.cfm>. Microsoft is now losing money on sales of its console worldwide, *see:* <http://www.gamitopia.com/news/stories/2002/04/21/10194537501.php>

between £30 to £50[40], the average price across all three platforms for a 'new' release, then, seems to settle at £45.

My suspicions are that our 'average' twenty-one year old gamer is likely to buy somewhere between three and six titles per year; and as the costs of these games increases, so to does the 'average age' of the market they are aimed at. In other words, both Microsoft and Sony are right to aim the majority of their advertising at the 'average' twenty-one year old[41] as these are the group who are most likely now to be willing to spend £45 on a long-awaited new title. Finally, there has always been a price range within which games have sold from generation (of machine) to generation. In the 1980s, the average game for an 8-bit[42] machine would cost between £5-10[43] (where 'budget' games cost £2 and £3[44]); the introduction of the 16-bit machines towards the 1990s, such as the Atari ST[45] and Commodore Amiga[46] saw prices rise to £20-£30 (again, 'budget' ranges were between £5 and £10). Finally, one of the other noteworthy attributes to the growth in game pricing could also be placed on mainstream advertising and promotion; while it probably comes as no surprise that higher budget games will be promoted using a larger advertising budget, there are many aspects of gaming which aren't using advertising to its full potential; the spaces within 3D games often cover huge areas; if a game such as *The Sims* (Electronic Arts, 2000) selling three million copies[47], could gently begin to introduce advertising through the products the user can *buy* within the game, development costs could be curtailed, ultimately meaning a cheaper end product[48]. This, I think, will happen; particularly as Microsoft and Sony market their consoles so aggressively, and while intertextual tie-ins between games and other (advertising based) media forms exist.

The Nature of the Film/Game: Digital Remediation and Convergence

Between May and September 2002, London's Barbican centre will pay tribute to the rise and rise of home interactive gaming in an exhibition called 'Game On'[49] which houses a museum: a curated collection of old games all running on old, refurbished hardware. The collection will then go on an international tour: the next stop being The Museum of Scotland, Edinburgh[50].

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[40] Xbox games range from £29.99 to £49.99, new titles averaging at £44.99; PlayStation 2 - the console which has been out for the longest period of the three - games range from £19.94 to £44.99; Game Cube games range from £39.99 to £44.99 (*Source:* Dixons.co.uk 17/6/02)
[41] *See:* <http://www.businessweek.com/bwdaily/dnflash/apr2001/nf2001043_175.htm>
[42] For definitions on calculating bit-rates, *see:* <http://www.webopedia.com/TERM/B/bit.html>
[43] For an overall view on pricing, *see:* <http://www.retrogames.co.uk/RGonline/html/page_1.html>
[44] *See:* <http://www.lysator.liu.se/adventure/Mastertronic.html> *and* <http://www.old-arcade.com/mastertronic/>
[45] *See:* <http://www.atari.st/>
[46] *See:* <http://www.cucug.org/amiga.html> and <http://www.amiga.com/>
[47] *See:* <http://www.gamanetwork.com/press_032101.html>
[48] Although this has been my theory for a long time regarding games and advertising, I am pleased to report that people are beginning to mention it now. The salon.com article, published in 1999, also gestures towards games as 'ad-spaces' <http://www.salon.com/21st/feature/1999/03/22feature.html>
[49] *See:* <http://www.gameonweb.co.uk/>
[50] *Source:* <http://www.noblepr.co.uk/Press_Releases/barbican/game_on.htm>

Countless hundreds of websites pay homage to 'retro': in terms of the computers themselves[51], the games[52], remakes of old games[53] and the increasing popularity of 'emulation'[54] technologies, a means by which old computer hardware and software can be simulated for nostalgia purposes. There is a means by which we can begin to realise that the classic games of the past remain unforgotten. Not only unforgotten, but re-visited through hardware emulation and re-built on newer platforms. Additionally, *really* memorable games spawn sites – or fan pages – as monuments to their ingenuity[55]. In the end, the thirst for preservation of old computer technologies – and their subsequent distribution online – can be seen in the same way as the care to which the British Film Industry painstakingly restores and re-digitises old films[56] in order to ensure – we would hope – their permanent preservation.

Interactive gaming - as a cultural form - has existed since the mid 1970s (Haddon, 1999:305); throughout the past thirty years, gaming has moved from users playing a series of simple electronic games on early consoles and small devices such as the many Atari consoles to large scale corporate multiplayer subscription games such as Sony's *Everquest*, a game I shall discuss later. Indeed, gaming has become more pervasive: big budget games are now advertised and promoted in the same way as films and music and the culture of gaming has been the subject of numerous films,
e.org/pd*f/intera*ct.pdf□>
computer hardware develops, doubling in capacity every eighteen months[57], it would

[51] For two quality online examples of this, *see:* <http://www.old-computers.com/news/default.asp> and <http://www.obsoletecomputermuseum.org/> ; In a physical implementation of this, a museum in San Diego actually houses the relics for public exhibition: <http://www.computer-museum.org/groups/about.html>

[52] A site containing a mass of information regarding games of numerous formats can be found at: <http://www.retro-games.co.uk/>; <http://www.mame.dk/> concentrates on 'roms' that have been salvaged from old arcade machines; and <ftp://ftp.nvg.unit.no/pub/spectrum/> has almost everything ever produced for the ZX Spectrum available from one *extremely comprehensive* FTP site.

[53] *See:* <http://www.worldofspectrum.org/remakes.cgi> *and* <http://retro-remakes.emuunlim.com/>. The growth of usage of Macromedia Flash on many websites has seen the (re)development of many old games using Flash itself; *see:* <http://www.newgrounds.com/collections/remakes.html>

[54] <http://www.emuhq.com/> offers links to an emulator apparently capable of emulating Sony's *PlayStation 2* hardware; *also:* <http://www.keepitretro.com/> *and* <http://www.emulationzone.org/>

[55] For example, I will use the popular game *Elite* (Acornsoft, 1984). Ian Bell – one of the programmers – made his own resource site for a game which has appeared in versions for over 30 different platforms: <http://www.iancgbell.clara.net/elite/>. *See also:* <http://home.clara.net/planetlave/> *and* <http://www.bbc.co.uk/dna/h2g2/alabaster/A711776> and a busy IRC channel #alt.fan.elite

[56] *See:* <http://www.bfi.org.uk/collections/>

[57] In addition to the widely acknowledged rule set out by Moore's Law, which adopted the notion that every eighteen months, computer processing speed doubles alongside capacity; a statistic that *appears* to have held true for three decades and is arguably still the case now (*see* Cairncross 1997:10). *See* also Gates (1995:88); Anderson (1996:99); Castells (1996:40); Mackensie and Wajcman (1999:3), the exponential rate of development found within the chips themselves can also be gauged alongside other developments in processing technologies (with dedicated processors and *more* 'efficient' information handling techniques such as parallel processing). Unsurprisingly, similar advances in speed, capacity and efficiency have been mirrored in the realm of graphics and audio hardware: from accelerated rendering and improved polygon 'shifting' rates per second, to sound handling with support for 5.1 (Dolby Digital) surround and audio processing techniques such as A3D and EAX, which serve to represent, or 'model' the acoustic parameters of a given space (from a concert hall to a covered metal tank). Such techniques have become set as programming standards, which can be subsequently

seem that audience reach seems to spread ever further in both public (online) and private (in the home) spheres.

Games place heavy demands on computer processing capacity. This, in turn, fuels a need to produce new hardware so that the software ultimately matches the gamers' expectations. Where the changes in technological capacity may have slipped by unnoticed, however, we are seeing an increasing scope for a market where programmers' and software houses promise new and immersive game-spaces[58], featuring bigger worlds and adventures than ever before, with graphics, which *look* and *feel* more real than what have previously been seen before. Spaces where characters act, react and behave in a more *lifelike* way than we could have possibly experienced: it is a realm where to see - to *play* - is to believe; and it is the '[c]onstant amazement at the predictable improvement of hardware and software [which] keeps players engaged' (Stallabrass, 1996:105).

It's already beginning to sound like an advert. This, of course, is intentional. In the 2002 Game Developer Conference[59], held in San Jose, California, programmer David Braben of Frontier developments[60] has suggested that the kind of rhetoric currently being used to describe (and sell) gaming in 2000 often seems to parallel that of the growth of cinema in the 1920s[61]; his argument being that *before* this time, technological ability resided *over* filmic content itself. He suggests that only now, are games beginning to 'sell' on content. Henry Jenkins, professor of Literature and Comparative Media Studies at MIT, expressed a similar view when he spoke in the 2001 Game Cultures conference, held by UWE, Bristol, UK[62], claiming that the 'state' of games now can similarly be likened to the cinema of 1920s; gaming looking set to become the dominant form of popular culture. Lev Manovitch – who I will discuss further in the next section – has argued that both the 1920s and the 1990s became caught up in the premise of 'new' technologies. 'New' became a buzzword, prefixing almost everything. Both decades, through the development of 'mass communication' technologies, possessed an enthusiasm for 'new' inventions and hence everything was somehow packaged as a technological quantum leap[63].

Of course, the idea that cinema any time after the 1920s was sold purely on content – and not technology – could be heavily argued against; here Angela Ndalainis would argue that the difference *after* the 1920s lay in the notion of remediation, a term she borrows from Bolter and Grusin (1999) which claims that the 'new' media forms rely upon historicity and repetition[64]: old media *remediate* new forms through a process of

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mapped into new games as they are produced; these advances existing as portable code which can be imported by the games manufacturers at the development stage.

[58] Poole (2000:136) cites the first real 'immersive' games as those employing a 3D engine, of which, *Wolfenstein* (id, 1993) and later, *Doom* (id, 1994) were the first and most successful. In subsequent chapters, I will discuss this term in greater detail, but will do so with the inclusion of other genres such as *Myst* (Cyan, 1994), which, Poole has suggested 'sweeps you away with its beauty' (*Ibid.*)

[59] *See:* <http://www.gdconf.com/>

[60] *See:* <http://www.frontier.co.uk>

[61] *See slide #14:* <http://www.frontier.co.uk/press/articles/gdc2002-5yrsfromnow.ppt>

[62] *See:* <http://humanities.uwe.ac.uk/>

[63] *See:* <http://www.manovich.net/docs/avantgarde_as_software.doc>

[64] *Cited in* <http://www.sensesofcinema.com/contents/00/5/baroque.html>

'folding': a term she borrows from Deleuze (1993). Now this pattern *is* occurring within game development, but only to an extent. What I hope much of my research will ultimately demonstrate is that these new forms of gaming do work in tandem with older forms of gaming and existing media forms. Games remediate probably more than any other form by pulling all other media forms into them; the process of production has even shifted this way. As gaming industries grow and games come to demand greater complexity still, so too will the expertise of other media fields – even physical fields, such as architecture.

As Leslie Haddon charts the development of the 'interactive game', he partially links the history of the development of games with the onset of computer science as an academic discipline (1999:306). Many of the earliest games, as he points out, were exploratory projects, hacked together by programming enthusiasts, some of which later served to function as demonstration pieces for companies to show what their systems were capable of doing. Games quickly became 'part of the package' for large corporate computer network solutions, to be found in amongst the range of diagnostic tools and utilities offered for system maintenance (*See also:* Herz, 1995). In time, academics, hobbyists and programming enthusiasts would begin to meet up: to learn, to exchange ideas, creating 'home brew' games and special effects (Haddon, 1999:322), many attempting to show what had 'not been seen before' with their programming skills. Over a period of years, this evolved into the industry it is now; with programmers and enthusiasts meeting at videogame trade shows such as E3, hosted annually in California[65]. Now – it can be argued – games, theme park rides, television-effects and cinema all seem to have become bound into a cyclical space of remediation, one whose origins all acknowledge a debt to steps taken in computer programming: a space Andrew Darley refers to as '*visual digital culture*' (2000:1).

And gaming draws its own origins from *all* of the above mediums in many respects: for stylistic guidance, game programmers have frequently turned to cinema. In the early 1990s, a software house designing for the Commodore Amiga, Cinemaware[66], worked towards the production of a series of games that would look and work like 'interactive movies': a term that ex-director Pat Cook claimed the software company had then coined[67]. Cinemaware's work serves as a good point for us to begin to analyse the notion of what makes an 'interactive game' (as a cross-pollination of cinematic codes and 'interactive' game material), partly for the reason that stylistically these games functioned to mimic the content of 1950s Hollywood cinema[68], but equally serve as a way to begin thinking about how games begin to function around being adapted from 'movie' to 'interactive movie'[69], where filmic

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[65] *See:* <http://www.e3expo.com/> *and* Poole (2000:103).
[66] *See:* <http://www.cinemaware.com>
[67] *Source:* <http://www.justadventure.com/Interviews/Cinemaware/Cinemaware_Interview.shtm>
[68] *It Came From the Desert* (Cinemaware, 1988) <http://www.cinemaware.com/clsgame_itcame.asp> shares an almost identical plot with *Them!* (Warner Bros. 1954) <http://us.imdb.com/Title?0047573>. In a similar vein – only much more advanced – was the later PC-based series of adventure games featuring detective Tex Murphy. These were some of the first CD-ROM based games to really cross-pollinate video clips with 3D adventure and exploration in a 1950s cinema style. The most notorious was *Under a Killing Moon* (Access, 1994) <http://www.cdaccess.com/html/pc/underkm.htm>
[69] I have placed a collection of adverts for Cinemaware products online – all are taken from computer magazines – and can be found at: <http://www.sussex.ac.uk/Users/faph3/cinemaware.htm>

elements are taken, digitised, adapted and re-worked, then fashioned into a story where 'playability' is programmed into the structure of the game.

Cinemaware, taking a lesson from the formulaic 'classic Hollywood' narrative film[70], prized highly the idea of 'formulae': games are logic based systems – and essentially 'formal' systems – as I will discuss in greater detail in the next chapter. In an interview, ex-company director Bob Jacob explained, their games were all structured using maps and storyboards, all their games featured narrative cut-scenes to distinguish between 'back-story' and 'gameplay': terms I will be examining again later. In terms of marketing, their games were packaged taking lessons from Hollywood, all featuring, in Jacob's own terms: 'at least one very buxom woman on the box'[71].

Cinemaware's intention to manufacture 'interactive movies' seemed deliberate; Jacob himself was clear: he wanted to make movies. His company was founded to produce content of this nature –where emphasis became placed on plot, rather than action. At this time, Jacob saw the creation of computer games as his 'backdoor' way into the film industry (*Ibid.*). At the time when they were creating games – the late 1980s to the early '90s – the 16-bit machines began to demonstrate the potential for more cinematic games to exist: ability to work with 'camera angles', 3D objects, lighting, the interleaving of video and sound, sampling and digitisation: all these techniques, with the addition of more memory, faster processing and software disk-based storage, led Cinemaware to discover something that would quickly become commonplace from that time onwards: the convergence between computer technology and cinema was a two-way process[72].

In this sense, then, the linkage between the cinema and the development of computer graphics and digital rendering techniques[73] can be seen through the increasing evidence of computer special effects and digital post-production for film. As Lev Manovitch rightly suggested, element by element, 'cinema is being poured into a computer'[74]. We have seen this in rendered films such as Pixar's *Monster's Inc.* (Docter, 2001)[75] and earlier traces of evidence in Disney's early classic, *Tron* (Lisberger, 1982). Indeed, on a purely historical axis, Disney's success throughout the ages can be attributed to a surmounting knowledge of technological capacity, and their subsequent exploitation of it. As John Pavlik explains, one of the key reasons to account for the success of *Steamboat Willie* (Disney, 1928), an early Disney film, can be attributed to Walt Disney's quick appropriation of new developments in

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[70] *See:* Bordwell and Thompson (1997:108-9)
[71] *See:* <http://www.justadventure.com/Interviews/Cinemaware/Cinemaware_Interview.asp>
[72] *See:* <http://www.gamespot.com/features/bladerunner/>. Here I am working from two pitches placed by two software houses for the computer adaptation of *Blade Runner* (Scott, 1982)*:* <http://www.darkslayers.com/bladerunner/game/BRG-Make/BRG-Make1.html> was Westwood Studio's pitch – which won the rights for conversion - <http://www.darkslayers.com/bladerunner/game/BRG-Make/BRG-Make2.html>
[73] The term 'CG' is now used by almost all directors, from the 'animatronic' creations rendered for *Jurassic Park* (Spielberg, 1993) to the light-based rendering of pixar <http://www.pixar.com> even toward rendered films meant to look 'real' <http://www.finalfantasy.com/>.
[74] *See:* <http://www-apparitions.ucsd.edu/~manovich/text/cinema-cultural.html>
[75] *See:* <http://www.pixar.com/featurefilms/inc/index.html>

technology; in this case the introduction of interleaving sound and vision in film. Disney used his own voice for the boat (Pavlik, 1997: 174)[76] and their production was extremely successful – perhaps unsurprisingly – and as a result, set the tone for something Disney would come to be renowned for doing: pioneering new ways of creating the film 'experience' – to show the world that anything is achievable within the parameters of the Disney fantasy.

George Lucas, a director who has claimed his own personal stake in the forging of 'digital cinema', through his demands upon technology to deliver 'better' motion pictures[77], self-confessed creator/leader in the design of the theatre-sound standard, THX[78], approached the gaming market from the opposite direction from dedicated software companies, such as Cinemaware. Realising the growing importance of technology and more specifically, the growing importance of the gaming industry as a market to be tapped, he created LucasArts[79], in 1982, to 'provide an interactive element to his vision of a state-of-the-art, multi-faceted entertainment company'[80]. Having already found a niche in the fast-developing sector of videogames, Lucas brought with him a group of experienced film designers/producers/crew members, and the idea of creating games that work in tandem with LucasFilm's[81] own products; a process of 'multiple integration' where elements of film are merged with games and graphics. Their games unite elements of film – working within the parameters of an existing plot – with a view to plot expansion, coupled with the introduction of new characters and situations into a recognised scenario: most notably, as extensions of the *Star Wars* or *Indiana Jones* series.

Starting with the release of *Maniac Mansion* (LucasArts, 1988), the company developed an interactive story engine with the acronym SCUMM (Script Creation Utility for Maniac Mansion)[82] essentially this was an interpreter for their own games and the basis upon which *any* graphical adventure game could be built. In other words, before they built *Maniac Mansion* they built a game operating system (or engine) which could handle and 'run' the game through a 'point and click' user interface. By doing so, they also created a new kind of game, as much as Cinemaware had done. The SCUMM system formed the basis of almost all games released by LucasArts for a period of ten years, often being modified and tweaked with every new

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[76] *See also:* <http://www.disney.go.com/disneyatoz/archives/movies/steamboat/steamboat.html>
[77] *See:* <http://www.starwars.com/bio/georgelucas.html>
[78] *See:* <http://www.thx.com/history/index.html> - THX is a set of standards for the implementation of sound within cinema spaces; Lucas – recognising that firstly, quality of sound was paramount in its' contribution to cinema wanted to research ways in which sound could be engineered and tested accurately before the film is mastered for general release. His technique, the Theatre Alignment Program (TAP) demands that a series of hardware standards are met by *participating* cinemas in order to reach THX approval, and that sound post-production studios offer correct testing facilities (through live 'dubbing theatres') and have a surmounting knowledge of the techniques involved – in addition to hardware - for mastering to THX standard. THX sound is supported by a multitude of cinemas worldwide and many high profile dubbing facilities, including London's Videosonics, facilitate this production standard. *See:* <http://www.videosonics.com/links.htm>
[79] *See:* <http://www.lucasarts.com/>
[80] *See:* <http://www.lucasarts.com/about/>
[81] *See:* <http://www.lucasfilm.com>
[82] *See:* <http://scumm.mixnmojo.com/scumm.php?style=original>

release[83]. What was really revolutionary about SCUMM is that it heralded a new way of thinking about how games are constructed; once the engine was built, everything else could be 'scripted' into it using a basic programming language; this had the advantage of being extremely easy to port from one computer platform to another (providing the interpreter had been translated)[84], but also allowed for games to be 'directed'; SCUMM was able to work by executing a simultaneous number of 'threads' at once, so a flock of birds might be flying in the background and a character might be following you. As soon as the player moves to make their character interact with another object, a script could allow a change of angle to take place. Alongside their proprietary scripting interface, SCUMM, LucasArts later developed a system called iMuse (Interactive Music Streaming Engine)[85] which worked through the cueing of sounds and musical motifs to fit any given moment within a game: so if the player were being chased, tense music would be cued; when they were safe from danger again, the soundtrack would be calmer. In essence, what LucasArts had created was software based apparatus capable of handling visual editing (and event handling) with an interactive story, along with a means of constructing a foley soundtrack according to the player's situation.

Perhaps unsurprisingly, then, LucasArts is now moving towards capitalising on multiplayer games: in tandem with Sony Entertainment, they have developed a system called MMORPG (Massively Multiplayer Online Role-Playing Game) and are using this as a basis for their game: *Star Wars Galaxies* (2001)[86]. Pitched, it would appear, to coincide with the mass of other *Star Wars* epiphenomena that finds its way into shops following the release of a new instalment of the film, it seems clear that Lucas's intention is to keep the game side of the *Star Wars* stories running long after the release of the third (or sixth) instalment of the film, as his site has claimed: 'we expect the *Star Wars* universe of original games to continue to thrive for many years after the completion of *Star Wars*: Episode III'[87].

So it seems clear to me that the industry developing around commercial gaming is indeed vast in terms of potential; leading developers agree that they have not yet scratched the surface with the limits of software and hardware, and David Braben (2002) has suggested that the pattern followed by Moore's Law will continue to hold true – or be exceeded – within the next ten years[88] although this doesn't necessarily mean that games will become 'better' or more imaginative.

As an academic discipline, however, the study of gaming is a new area and over the next section, it is my hope to build a platform – through a critique of the current academic thinking – from which we can begin to 'think' about games as cultural objects.

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[83] *See:* <http://scumm.mixnmojo.com/games.php?style=original>
[84] *See:* <http://www.cowlark.com/scumm/introduction.html>
[85] *See:* <http://www.lucasarts.com/about/milestones.htm>
[86] *See:* <http://starwarsgalaxies.station.sony.com/features/faq.jsp>
[87] *See:* <http://www.lucasarts.com/askteam/archive/askcount.jsp?num=3>
[88] *See: Fn. #59 and Slide #5 of* <http://www.frontier.co.uk/press/articles/gdc2002-5yrsfromnow.ppt>

I. Mapping the Field: Approaches to Gaming

Introduction: Gaming as an Object of Study

In this section, it is my intention to lay the foundations for a set of theories which serve to provide an overview of the current academic thinking on gaming as an object of study, whilst also drawing a trajectory for where my own thinking is aligned. Primarily, I will consider gaming from the axis of cultural studies; this is significant, as until recently, theories on gaming have existed only in the realm of mathematics; the majority of books with 'Game theory' in the title coincide with this branch of thinking and – for what it does – it works well to explain at a level of logic *how* games are processed by a machine, or *how* probabilities can be calculated within a specific situation. The birth of Game theory has been credited with John von Neumann and Oskar Morgenstern's *The Theory of Games and Economic Behaviour* (1944), which, for the first time, sets out a rule for the 'logic' of an interactive process within a game:

> They defined a game as any interaction between agents that is governed by *a set of rules* specifying the possible moves for each participant and a set of outcomes for each possible set of moves.
>
> (Hargreaves Heap and Varoufakis, 1995:1); *My emphasis*

In a sense, 'Game theory' is rooted in the study of the *logistical design* of games; it offers rules and specifications for a structuring logic which could provide the basis of a system for 'simulating' or enabling the creation of a computer based opponent for, say, a chess game. For readers of cultural studies and its related fields, there is a move towards acknowledging gaming as a prominent social and cultural form and by doing so, considering what this 'form' means in within a wider social context. In other words, study within this area constitutes gaining a better understanding of what games mean and how they are used and discussed within social (and private) spaces. As such, there is a need for a language and groups of rules to be developed within this area. The good news is that this 'language' is slowly emerging[1]; over the next two chapters I will begin to break this area of study down into its constituent elements, starting with its origins.

I will begin by mapping this field of research within by suggesting that there are *five* significant areas currently being explored. Of these areas, analysis is aligned with the study of 'players' or 'users' and this can be broken down into ethnographic research, reception theory and studies of what I will call, to quote Sarah Thornton (1995), 'subcultural capital'. For textual analysis, the two key areas lie in narratological and

[1] We can certainly consider theories on gaming as emerging from a plethora of writing which already exists to comment upon new media forms: visual culture (Darley, 2000), technological culture (Manovitch, 2001), gaming as social phenomenon (Poole, 2000), through the 'manufacture of mass culture' (Stallabrass, 1996), theories on Virtual Reality (Morse, 1998; Wooley, 1992), reception theory (Barker, 1998; 2000), network theory (Castells, 1996), studies of MUDs (Bassett, 1997), Cyborg / *Body* studies (Hakken, 1999; Balsamo, 1996), spatial performance (Murray, 1998), theatre (Laurel, 1991) Cinema and Postmodernity (Friedberg, 1994), Postmodernist theory (Harvey, 1990; Baudrillard, 1984; Jameson, 1991), Remediation (Bolter and Grusin, 1999) and cyberspace (Gibson, 1986) to name a few broad examples.

ludological analysis. Of course, many of these areas can intersect at any time, so my terms function in an attempt to subjectively isolate this research into *groups*.

User Analysis: Ethnographic Research[2]

Fascinatingly, this area of research is looked upon keenly within the industry. Computer processor manufacturer Intel[3], are embracing this research area and by 2000, their research development budget was $40 billion[4]. They employ a team of psychologists, anthropologists and social scientists to promote what they call 'people centred research'. Much of their research centres on the study of 'natural environments', some typical settings could include schools, medical clinics and shopping centres and the research aims to discover 'how' people use and relate to technology. For corporate research, this area of research is partially in honour of a process of 'making sense' but ultimately the investment is made expecting – in return – a better product for users. Particular developments gained from ethnographic research methods have lead toward greater understanding of Human Computer Interaction[5], culminating in the development of the Xerox Alto[6], in 1972 (which led to the development of the 'Star' in 1981), what became the Apple OS in 1984[7] and the evolution of Microsoft Interface Manager, which subsequently became known as Windows (1981-2002)[8]. The other significant result of ethnographic research has led to the evolution of 'web usability'[9]. More specific case studies surrounding gaming would include research undertaken by the British Educational Communications and Technology Agency (BECTA)[10] on games and their contribution to learning within the classroom[11].

Perhaps the most extensive ethnographic research being undertaken in the academic sphere can be attributed to David Buckingham and Julian Sefton-Green. Their wide-scale ethnographic research[12] - which spans seven countries - centres on the global phenomenon of *Pokémon*[13]. Based in the Centre for the Study of Children, Youth and Media, the UK contribution examines the marketing of the 'global games culture' in consideration of the 'unique significance' of Japanese game culture worldwide. Speaking at the Game Cultures conference in Bristol (2001), Buckingham and Green linked the success of the 'poké-verse' to three factors:

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[2] Intel see this area of research as the 'branch of anthropology that deals with the scientific description of specific human cultures' <http://www.intel.com/labs/about/reallives.htm>
[3] *See:* <http://www.intel.com/>
[4] *Source:* <http://zdnet.com.com/2100-11-502616.html?legacy=zdnn>
[5] Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them. *See:* <http://sigchi.org/cdg/cdg2.html#2_1>
[6] *See:* <http://members.fortunecity.com/pcmuseum/alto.html>
[7] *See:* <http://www.macdirectory.com/culture/appleevolution/evolution.html>
[8] *See:* <http://members.fortunecity.com/pcmuseum/windows.htm>
[9] Jakob Nielsen's *extensive* website explores usability in intricate detail <http://www.useit.com>
[10] *See:* <http://www.becta.org.uk/technology/software/curriculum/computergames/index.html>
[11] *See:* <http://news.bbc.co.uk/hi/english/education/newsid_1879000/1879019.stm>
[12] *See:* <http://www.ccsonline.org.uk/mediacentre/Research_Projects/pokemon.html>
[13] *See:* <http://www.pokemon.com/>

As Nintendo had already realised with *Tetris*[14], all they needed a 'killer app' to drive sales of their Gameboy[15] handheld consoles and accessories. In 1998, they concentrated the majority of their research budget into *Pokémon*. As the *Pokémon* games[16] could also handle 'head-to-head' playing via a Gameboy 'link lead'[17] – requiring two cartridges of the same game – and a 'Transfer Pak' which allows linkage between the N64 console and the Gameboy[18], launched with the *Pokémon Stadium*[19] (2000) game, they drove sales 'across consoles'. Finally, they knew that they had a text which was perfect for its core audience: a family with young children. They generated £5 billion within one year. Over a thousand different *Pokémon* products were available in Japan at its peak, meaning the securing of a 360º marketing synergy and what Marsha Kinder (1991) would call a true 'multimedia intertextuality'. Their research is still underway.

Reception Theory

Essentially born out of film studies, although this area of research covers wide ground. As an ideology, it asserts that audiences are *active* in their consumption of a media text, make decisions about it and bring their own previous experience and their 'cultural baggage' to the text as they interpret it. Reception theory began to accelerate within the 1990s; its doctrine, in a sense, was to bring earlier 1970s 'screen'[20] and apparatus theories up to date, arguing that the screen approach had now been outmoded. In an age of multimedia, cross marketing, satellite television and video recorders, it argued that within an array of cultural production, the situation of film theory could no longer be held to function exclusively in the domain of textual and meta-psychological research. Moreover, screen analysis relied specifically on the positioning of the viewer within the darkened cinema auditorium in order for processes of identity recognition, or mis-recognition, to gain full effect. As Annette Kuhn has suggested, the classical configuration of cinema theory must now be regarded as 'historically and culturally specific' (1999:7), although this mode of analysis can take credit for a heightened understanding in the 'politics of the image': the growth of analysis of the 'image effect' or the 'reading effect'.

Reception theory positioned itself by asserting that analysis should not be bound purely to a semiotic realm. As such approaches were grounded in Marxist and psychoanalytic theory they too had an historical and cultural specificity and – as such – often failed to take into account that film was no longer a medium unto itself; as viewing patterns changed and the cinema was no longer the primary domain of film reception, so theory began to evolve. Reception theory addressed how audiences

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[14] A detailed history of the history of *Tetris* – and the ensuing court case – can be found at: <http://www.atarihq.com/tsr/special/tetrishist.html>; *and* <http://www.wikipedia.com/wiki/Tetris> <http://archive.ncsa.uiuc.edu/Classes/MATH198/mmurphey/tetris.html> *and* Sheff, D. (1993)

[15] *See:* <http://www.gameboyadvance.co.uk/english/skipintro.html>

[16] There are now around 13 different *Pokemon* games, *See:* <http://pgz.pgamers.com/main.shtml>

[17] *See:* <http://www.google.com/search?q=gameboy+link+lead&hl=en&lr=>

[18] *See:* <http://www.gameszone.co.uk/Features/gameboytransferpack.htm>

[19] *See:* <http://www.pokemonstadium.com/>

[20] The current journal – which reached its peak in the 1970s – is available online, archived from 1996 onwards, at: <http://www3.oup.co.uk/screen/contents/>

make sense of – or relate to – films (and other texts) in relation to their knowledge as 'users' of popular culture; in other words, it is a theory which understands that films are not read in isolation, rather they are enjoyed and understood – and positioned - within a landscape surrounded by hundreds of other related texts. It considered the position of the text in relation to the environment in which it might be received (for example: the home), acknowledging the *position* of the film within the audiences appreciation of certain aspects of popular culture, rather than the psychological *position* of the viewer within the film and the cinematic apparatus. As Collins *et al.* have suggested - reception theory involved 'recognising the power of audiences to decode texts according to local structures of feeling' (Collins *et al.*, 1993:3). The new approach recognises a terrain where, in the words of Tony Bennett (1993): 'an intertextually organised reader meets an intertextually organised text'[21].

The reception theory approach is, I think, accountable for the development of the 'effects' debate within the field of cultural studies. Current examples of cross-media examinations of media effects (including games) have been covered by Ang (1991), Morley (1992), Greenfield (1984); Provenso (1991); Barker (1998, 2000). A significant quantity of research is also underway regarding the effects of 3D shooting games[22] both within Europe and North America in particular. Reception theory within the realm of gaming is also covered by Turkle (1996) J.C. Herz (1995) and Haddon (1999). A more specific use of reception theory and gaming has been undertaken by Kate O'Riorden, who offers a case-study of *Tomb Raider* as 'played in a domestic environment' (2001:224). At outset, O'Riorden links the space of television and computer games by examining console-based versions of *Tomb Raider* and by doing so explores the game as played within the context of a social space. She concludes that the game raises significant questions for identity formation through the unease of a dynamically changing 'imagined narrative'; the game's physicality 'provides a prosthesis for embodying the imagination and is an extension of the body, (…) putting 'you' or 'I' into the game' (*Ibid.*236).

Subcultural 'fan' research

In *Club Cultures*, Sarah Thornton (1995) discusses the growth and dissemination of dance 'sub-cultures' through an examination of the ways in which they use 'micro media' (such as flyers and listings) to create 'taste cultures'. By examining these cultures through the ways in which they connect with consumerism, she uses the term 'subcultural capital' to explain how taste formations and hierarchies take place in niche cultures. The early part of the 1990s saw significant amounts of writing appear surrounding the use of the internet which followed similar lines, for example: Herz (1997); Cherny *et al.* (1996); Rheingold (1994) and Dery (1996).

With the advent of networked gaming, however, a much more focused set of writings began to appear, which served to explore the ways in which groups interact

[21] *Cited by Henry Jenkins, see:* <http://web.mit.edu/21fms/www/faculty/henry3/vampkiss.html>
[22] *For example, see:* <http://www.mediawatch.com/dukenukem.html> *and* <http://culturalpolicy.uchicago.edu/conf2001/links.html>. *Grand Theft Auto III* (Rockstar, 2001) has been banned in Australia <http://www.zdnet.com.au/printfriendly?AT=2000025001-20262360>

over networks, through newsgroups and MUDs and eventually, this area of research will begin to channel towards how multiplayer games become orchestrated; to avoid unnecessary repetition, I will consider this area of research in more substantial detail in the final section, when I consider multiplayer formations.

Textual Analysis: Narratology

Over the next chapter, I will be examining the evolution of narratological analysis from early Russian formalism, through to structuralism and post-structuralism. Narratology, simply put, implies a reading of the text at a 'textual' level; this means undertaking a 'reading' of a text using any set of analytical tools which would allow its deconstruction and understanding. Narratology, as a discipline, can be called in to account effectively for a reading off of 'layers of meaning' for almost anything with a story attached to it; hence, as I define it in the next chapter, I will follow Roland Barthes' (1977) proposition that narrative is a ubiquitous form, mappable onto anything humans have an emotional relationship with. I will be discussing Barthes in more detail shortly.

To an extent, then, many computer games could effectively be treated as texts to be 'read', especially where there is an element of intertextuality taking place. Indeed, at the 2001 'Game Cultures' conference held at the University of the West of England, Geoff King undertook an analysis of the *Die Hard* trilogy, performing a reading of the games through the film itself, in examination of the kinds of 'pleasures' both forms offer[23] (*See also:* King and Krzywinska, 2001). At the same conference, Greg Smith used foundations of film theory as a basis for the analysis of *Final Fantasy 7* (Square, 1997)[24] and essentially examined it as a piece of 'interactive cinema' but in many respects served as a narratological 'walk-though' of the game; hosted by Smith's own intimate (and detailed) knowledge of the game, its back-story, characters and sequences.

All of the above approaches, to an extent, demonstrate how narratological analysis can be mapped onto a game. However, within certain genres of game – particularly earlier games – obvious narrative structures are harder to spot. Such analysis, while *narratological* in nature, can function to sit 'outside' the text and cannot be strictly called to resemble a 'close reading' of the text but more of a personal analysis of the game. In *Hamlet on the Holodeck* (1997), Janet Murray describes the 'constant bombardment' of *Tetris* (Pazhitnov, 1985) as a 'perfect enactment of the overtasked lives of Americans in the 1990s'[25]. Its significance as a cultural form, then, can be examined in the wider context of clearing an ever increasing in-tray 'in order to make room for the next onslaught' (*Ibid.*). Similarly, Stephen Poole has described *Pac Man*[26] (Namco, 1980) 'as a neo-Marxist parable of late capitalism (…) the pure consumer' (2000:189). In essence, what both Murray and Poole are doing here, are assimilating two different games into a cultural register, in both cases, both games

[23] *See:* <http://www.humanities.mcmaster.ca/~mactavis/mla_games/king.html>
[24] *See:* <http://www.squaresoft.com/web/games/ff7/>
[25] *Cited in:* <http://www.jacaranda.org/frasca/thesis/representation.html>
[26] *See:* <http://www.salon.com/ent/masterpiece/2002/06/17/pac_man/>

were extremely popular and have amassed cult followings as 'classic games'; both games have been 'remade' – using different programming languages, on different machines, using a range of different iconographic and stylistic techniques to repackage and reinterpret the game. Narratological analysis has – and will always – provide sets of tools for describing what games 'are' from a visual, cultural, iconographic and genre-based context, however there exists another mode of thinking which argues that games offer more than purely narratological approaches can offer: this is where ludology begins to fit into the map.

Analysis of Play: Ludology

As its name suggests, ludology has slightly different intentions. Gaining its name from the Latin, 'I play'[27], ludology focuses on the game as an object of study in its own right and would argue that it deserves its own analytical tools. In a sense, then, we could consider ludology being to games what 1970s screen theory was to film studies, an exclusive language, borne out of semiotic analytical forms, which maintains that the object at the centre of analysis is *similar* to other existing cultural forms, yet at the same time, different.

Andrew Darley in essence reinforces this link when he considers players of games as 'interactive spectators' (*See* Darley, 2000:170). Similarly, in her essay '*Frenzy of the Visible*', Angela Ndalainis works from the point of narratological analysis, whilst shifting analytical emphasis by suggesting that new forms of cinema and entertainment are emerging, which focus more on a principle of immersion; the trend she is identifying here, lies in:

> the collapse and dispersal of 'meaning' as a result of the movement beyond narrative concerns towards a form that prioritises the visuals and spectacle (…) [which] manifests itself especially in the *move away* from mainstream cinema's *supposed ties with the nineteenth century literary tradition* and its concerns with *story telling* and *narrativity*, towards an aesthetic centered around action, movement, speed, special effects (visual and aural), and engagement on the level of the sensation[28] (2000: my emphasis).

Now Ndalainis is addressing films and theme park rides, but what I think is useful here lies in her acknowledgement that a shift is occurring away from purely narratological analysis, towards thinking of a form which centres around *immersion*; she articulates an opening for new analytic forms to take place to complement other existing analytical tools, thinking about 'engagement on the level of sensation'.

In the third section, I will pay considerably more attention to forms of ludological analysis, however in the meantime, I want to briefly discuss some of the theorists currently engaged in such analysis. In *Cybertext: Perspectives on Ergodic Literature*[29], Espen Aarseth (1997) sets out his premise through explaining that a logical point of analysis arises in the study of games by attributing terms to them to enforce a mode of textuality: so we would could consider a 3D game 'world' or a

[27] *See:* <http://www.tradgames.org.uk/games/Pachisi.htm>
[28] *See:* <http://www.sensesofcinema.com/contents/00/3/matrix.html>
[29] *See:* <http://www.hf.uib.no/cybertext/Ergodic.html>

'labyrinth' to compensate for the underlying mass of calculations being computed as this space is generated. Such analysis is, of course, unavoidable: human beings use metaphors and terms to make sense of abstract processes (such as chains of zeroes and ones moving between registers and processors). The key to the thinking here, however, is moving towards thinking about the 'game' as an interactive object, rather than an ever-changing narrative form. In '*Aphoria and Epiphany in Doom and the Speaking Clock*' he states that 'a computer game is textual, but it is not narrated (…) as there is no such thing as a predetermined story' (1999:35). Jesper Juul, who I will return to again later, stakes his claim by considering games as 'fairly formal structures that in complex ways spawn and feed player experiences' (2001)[30]; that the non-determined state of the story within a game has huge implications for how we perceive games.

There has, I think, been a mode of thought that has found comfort in using existing structural analytical forms and applying them directly to games and multimedia. Undoubtedly this approach finds its roots in notions of convergence: the amalgam of analogue forms that are flowing into digital hybrids, such as 'digital movies'[31], hypertext 'narrative': where old mediums are, to quote Bolter and Grusin (1999) 'remediated', both at the level of design and equally at the level of analysis. Now that is not to say that a narratological approach is unsuitable, merely to state that games can be thought of objects in their own right and this may warrant the development of a new 'language': new paradigms for the analysis of objects which are similar, yet at the same time, different.

It is my intention to sketch out a theoretical framework for how I intend to think about games as I analyse them. Much still needs to be quantified and clarified before we can place games into an overarching historical and objective context. Before I do this, I would like to say a little about my approach: the remainder of this section will trace an evolving path of academic theory to present day, which – I hope – will enable us to illuminate games as objects for study. Before I begin to move into an analysis of games themselves, I have chosen to set out a wider context which, I hope will serve to justify some of the ways in which we can begin to place a possible evolution of forms of gaming before we can begin to think about the phenomenon of gaming.

[30] *Source:* <http://www.gamestudies.org/0101/juul-gts/>

[31] Interestingly, this mode of synergy – which I will be discussing further – can be seen in the growth of machinima: literally computer driven puppetry, where the tools being used to make games are being used to make 'movies' *see:* <http://www.machinima.com/>

1. Reading Narrative: Structuralism, Formalism and Beyond

'Narrative is present in myth, legend, fable, tale, novella, epic, history, tragedy, drama, comedy, mime, painting, stained glass windows, cinema, comics, news items, conversation' (Barthes: *The Structural Analysis of Narrative*)

We begin with narrative.

Roland Barthes tells us that it is ubiquitous; it is 'international, transhistorical, transcultural; it is simply there, like life itself' (1977:79). How, then, can we understand something so universal, something by Barthes' own definition so abundant and so culturally transparent? We need a system. For Barthes, the system was structuralism[32].

Structuralism finds its basis in the study of linguistics. Its proposition: to create a scientific form for criticism. So if narrative is present in everything, the argument runs, then what we need is a framework – or a model – which can be grafted onto wherever that narrative takes place: a grand theory through which we can understand – and *read* through – anything: including stained glass windows.

The idea that structuralism would be useful in the study of cultural phenomena is based on two fundamental insights: 'first, that social and cultural phenomena are not simply material objects or events but objects and events with meaning, and hence signs; and second, that they do not have essences but are defined by a network of relations, both internal and external' (Culler, 1998: 73). Therefore, structural analysis can be deployed whenever we intend to report upon – and hence, analyse – a cultural phenomenon involving understanding a level of *meaning* created by human actions or productions.

To consider a cultural form through a lens of structural analysis is to accept that meaning is always made through an underlying network of contexts; an understanding that we are reading objects in relation to one another set within a wider cultural framework of meanings which are already in place: a cultural form is always based within a culture which carries a specific set of codes and conventions[33]. As Claude Levi-Strauss suggests: 'particular actions (…) are never symbolic in themselves; they are the elements out of which is constructed a symbolic system, which must be

[32] Bathes considers structuralism as a kind of universality, a technique to master a text and uncover different layers of meaning: 'is not structuralism's constant aim to master the infinity of utterances [*paroles*] by describing the 'language' ['*langue'*] of which they are the products and from which they can be generated' (1977:80). Conversely, Vladimir Propp's study of fairy tales the rubric of structuralism to offer a tighter, more honed analysis; by focusing on a series of classic texts, he creates a system for mapping similarities between them: 'fairy tales possess a quite particular structure which is immediately felt and which determines their category, even though we may not be aware of it' (1968:6).

[33] For example, Culler suggests observing a game of football from the perspective of a culture who has no knowledge of the game: here one could offer an 'objective description of the actions which took place' (1998:73), effectively separating the game from the culture and the sets of traditions and meanings which surround it; in other words: removing football from its network of social and cultural codes and conventions and offering instead an analysis of what one 'sees' without knowing or appreciating the ramifications of what they see.

collective' (Culler, *Cit. Ibid.*). A system of meaning will be derived – from the reader's perspective – through a surmounting knowledge of *that text* within an overall cultural context. On one level, then, a reading of a cultural object through structural analysis requires an understanding of the context within which the object is held in place, a structural reading will deal with a text *in context*.

However, as de Saussure (1983) has suggested, readings can often be corrupted through what he terms as the 'arbitrary nature of the sign'. In other words: structural analysis works on the premise that signposting a cultural object will work, because all other objects surrounding it will be anchored in concrete meanings. As structuralism originated from the study of linguistics, so structuralism has a 'grammar' formed in part by the culture and part by the language in which it is situated. However: the reading of meaning is flexible and open to interpretation and hence, the signifier and the signified[34] might not reference each other in a concrete way. The point de Saussure is making, then, is that linguistic signs are *indeed* arbitrary and this is the first shortfall of any form of analysis which works at this level. It often tends to focus on the logical structure of the text rather than the network of feelings, thoughts and emotions that humans attach to the process of meaning making; it neglects 'the role of signs as part of social life' (*Ibid.*15). All too often, human beings are *not* precise, systematic or predictable and so scope for subjective human response to a text – or what was termed by the 'new critics' of literary theory as 'the affective fallacy' (Wimsatt and Beardsley, 1954:21) was not always taken into account within this body of theory.

Of course, structural analysis progressed and developed. However, although structuralism is still useful for the ways in which it provides basic 'ground rules' for the analysis of a cultural form – such as an advert or the packaging on products[35] – and provides a solid and complete system for the breaking down of an object into its constitutive components, it has an historical specificity, much like the 1970s screen film theory and is useful for the modes of analysis that acknowledge a debt to it. As structuralism has been deployed in the analysis of narrative and myth – two aspects, which, I believe, can contribute to our understanding of interactive games – then, at the very least, a critique of such approaches could prove to be a useful point from which to open the analysis. By doing so, I am hoping later to be able to sketch a proposal of what we can think of as 'interactive media forms', and subsequently, how we can begin to think about their function as cultural phenomena.

Transitions: Russian formalism

Before we can progress any further, it would make sense to begin with an attempt to briefly consider the historical context of structuralism as a movement[36]. In order to do

[34] Literally: Signifier – an object (a ball); signified: the relative word in a given language (B-A-L-L).
[35] *See, for examples:* Tolson, (1996); Barthes (1977)
[36] Although it must be acknowledged that my intention here is not to compose a comprehensive historical roadmap of structuralism. In reality it is, I suspect, impossible to assign a fixed 'start date' as any detailed foray into the historical roots of structural enquiry will uncover evidence of its' inception (in one form or another) across a range of disciplines, not in the least connected. Rather, I use Russian Formalism as my own historical axis within which to launch my enquiry (until further notice) because

this, I am going to briefly step back to introduce another branch of theory: formalism. Terry Eagleton has suggested that 'if one wanted to put a date on the beginnings of the transformation which has overtaken literary theory in this century, one could do worse than settle on 1917, the year in which the young Viktor Shklovsky published his pioneering essay "Art as Device"' (1983; *cit.* Rice and Waugh, 1989:18). The transformation undergoing consideration here, as outlined by Shklovsky, a member of the formalist movement in the USSR in the 1920s, was of an approach towards literature through the process of *ostranenie*: the defamiliarisation of habituated perception of both language and text. By shifting the process of *reading* away from what Shklovsky considered as 'habituated (automatic) reception', a viewpoint was articulated from where the literary tradition could no longer be considered as a seamless continuity, but as a discontinuity where breaks and reformations in form and formal devices continually renewed the system: in other words, the formalists approach acknowledged that to study literature was *also* to study its language components: opening a view of literature as a relational system, one where the defamiliarised elements change in time and new devices replace the older, now familiar elements[37]. As Shklovsky has suggested, their process of analysis was one where making forms 'difficult' by processes such as 'algebrization' (the overautomation of an object) permitted the greatest economy of perceptive effort; he claimed that: '*Art is a way of experiencing the artfulness of an object; the object is not important*' (1998:12).

Much of the formalists' writing remained unheard of until much later on in the century. Due to the harsh political climate within which it was created, formalism was largely excluded from academic discussion until it was adopted and translated in the 1960s[38], some forty years later. Structuralism – according to Rice and Waugh – has been 'generally recognised as 'arriving' in France in the mid-1960s', although the impetus for its development can quite clearly be seen to have stretched back to the earlier 'formalisms' (such as Russian formalism), and the kind of structural linguistics that Ferdinand de Saussure set into enquiry considerably earlier in the century[39]. Structuralism – much like the formalism that preceded it – had postulated the notion of approaching literature as a science; an approach, which was much more concerned with form rather than content. In this sense, the text would become more like something to be mastered through the creation of over-exhaustive structural mapping (*e.g.* breaking-up the text into groups of interlinked elements or components and analysing the interactions between them). This constructs the discourse of

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of the conditions of its' development – as a movement [I suspect] effectively silenced in a time of extreme political censorship.

[37] Or, in Rivkin and Ryan's words: 'literary evolution is the result of the constant attempt to disrupt existing literary conventions and to generate new ones (…) for literature to be literature, it must constantly defamiliarise the familiar, constantly evolve new procedures for story-telling or poetry-making. And, such change is entirely autonomous of the social and historical world from which the materials of literature are taken' (1998:5)

[38] Although this date is subject to debate; Victor Erlich's book was written in the mid-50s (*See:* Jackson and Rudy, 1985)

[39] Although his *Course in General Linguistics* was published in 1959, the book – according to Susan Wittig (1975:2) - was assembled from notes taken from his lectures by two students, Charles Bally and Charles Schehaye, given at the University of Geneva from 1906 to 1911, where he formulated his theories of language (*See:* Witting [ed] 1975; Saussure, 1983).

structuralism as a kind of *meta-language* operating within the parameters of language itself. It is the topographical – the mapping – nature of both disciplines (formalism and structuralism) that makes both worthy of analysis; on the one hand, the process of 'algebrization' offered by formalist approaches, and the structuralist 'systematisation' of elements on the other. Saussure's approach to structuralism has been explained through the logic of chess[40]; a game based on a system of rules that has endless possibilities: it is often said that no two games of chess are ever the same.

Through reaching an understanding of some of these earlier analytical forms – and I will be examining formalism in more detail later – my intention is to lay out a potential roadmap for the study of 'interactive games' using two *systematic* approaches as my starting point. Games - as I have previously suggested - are complex formal systems; often structured using a mixture of bespoke and commercial development tools, these are used to generate machine-readable code to house the game structure (its 'engine') and all the elements within the game. Due to the size and complexity of these systems (all of which make the 'game-worlds'), elements within the game are built layer upon layer as 'objects', often starting with the smallest game elements first[41]. The game engine will then render the game by organising and placing all the coded objects into the game-space (the *mise-en-screen*) according to a pre-prescribed 'map' of the space, a map which understands the relationships between all the objects by applying physical laws and rules as to how they might interact with each other. As both structural and formal approaches have been employed for the study of fixed ('static') media narrative forms, such as film, advertising and C19 literature, their investigation seems appropriate for the analysis of dynamic ('interactive') media forms, such as games. In order to carry out my investigation, then, I am going to address two fundamental questions: primarily, where do the primary weaknesses lie in both modes of analysis; and second: how can we differentiate between static and dynamic media forms? What makes interactive games 'new' and different and how can those values be reflected through the *development* of existing analytical techniques and tools?

Formalist-structualist analysis at work

In *Analysis and Interpretation of the Realist Text*, David Lodge sets out to demonstrate how formalist-structuralist techniques are best put to use in literary analysis. His question, at outset, is 'whether progress in theory and methodology *means progress* in the critical reading of texts' (1996:25)[42]. Covering a vast array of

[40] John Lyons uses the example of a chess game to effectively summarise Saussure's analogy: 'In the course of a game of chess the state of the board is constantly changing, but at any one time the state of the game can be fully described in terms of the positions occupied by several pieces. It does not matter by what route (the number, the nature, the order of the moves) the players have arrived at the particular state of the game: this state is describable *synchronically* without reference to the previous moves. So it is with language, said de Saussure. All languages are constantly changing; and just as the state of the chess-board at some particular time can be described without reference to the particular combination of moves that has brought the game to that point, so can the successive, or socially and geographically delimited, states of a language be described independently of one another' (*Cit.* Wittig, 1975:2-3)

[41] This approach to programming is often referred to as 'object oriented' for precisely this reason.

[42] *Italics: my emphasis*. In a footnote [directly after this quote], Lodge continues: 'I do not mean to imply that theory can only be justified on such grounds. (…) [I] wish to consider whether exponents

analytical techniques, he divides these into three groups[43]. My intention is to briefly concentrate on his first two groups. The first group sets into action the methods and techniques used to discover the *langue* of narrative[44], accepting that *langue* is governed through a system of rules. This group, Lodge identifies as being particularly concerned with the examination of function and transformation[45] exchanges within a narrative structure. This, I will argue later, becomes a useful methodology to adopt when we take an analysis of dynamic – or interactive – narrative into account, where the exchange of values moving between objects and actants may be dependent upon the state of other objects in relation to it at any given time within a narrative[46]. Although Lodge considers such an approach more rewarding 'when applied to narratives of a traditional, formulaic, orally transmitted type, rather than sophisticated literary narratives' (1996:26) which could perhaps serve as a warning when taking the sophistication of dynamic narrative into account.

However, what Lodge's approach does lend itself particularly effectively to lies in its allowing the 'uncovering of the system that allows narrative texts to be generated and competent readers to make sense of them' (*Ibid.*); such uncovering will serve as a strong starting point from which to begin thinking about the overarching structures of dynamic narrative. Conversely, in *Hypertext and the Art of Memory*, Janine Wong and Peter Storkerson (1997) investigate the mnemonic traditions which they credit as finding their origins within ancient Greece. These traditions – processes of rote learning and verbatim recital – they parallel with the hypertext-based model of narrative (super-narrative)[47], suggesting that the emergent new media forms constitute

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of 'practical', or descriptive and interpretative, criticism have anything useful to learn from recent developments in the theory of narrative and poetics of fiction' (1996:37)

[43] Which are: (1) *Narratology and Narrative Grammar*; (2) *Poetics of Fiction*; (3) *Rhetorical Analysis.*

[44] Here Lodge refers to the distinctions first placed by Saussure on notion of language as *system*. Essentially his work considered meaning as being made from the juxtaposition of differences between diametrically opposed states, for example: Hot/Cold, Good/Bad, leading to the mapping of a simplistic binary system of difference between words; that one could be defined in relation to its opposite. Following from this, he suggested that language broke down into two terms; on the one hand *langue*: the system of language, the system of forms (the rules, codes, conventions); on the other hand, *parole*: this refers to speech itself, the acts made possible by *langue*.

[45] 'In the theory of Greimas, for instance, all narrative consists essentially of the transfer of an object or value from one actant to another. An actant performs a certain function in the story which may be classified as Subject or Object, Sender or Receiver, Helper or Opponent, and is involved in doing things which may be classified as performative (tests, struggles etc.), contractual (establishment and breaking of contracts) and disjunctional (departure and returns). These functions are not simply identifiable from the structure of a narrative text: for instance, several characters may perform the function of one actant, or one character may combine the functions of two actants. All concepts are semantically defined by a binary relationship with their opposites (e.g., Life / Death) or negatives (e.g., Life: Death::Non-Life::Non-Death), so that all narrative can be seen as the transformation into actants and actions of a thematic four-term homology' (Greimas, 1966, 1970, 1976 *Cit.* Lodge, 1989:25-6)

[46] For example, within a given interactive narrative, objects may pass from states of *intangibility* – where, say a door may be locked – once a key has been located, the intangible object will invariably shift state into *tangibility*, where possession of a key may constitute the unlocking of the next narrative layer. This will have an effect on any of the layer that is 'locked out' of the narrative at any one time.

[47] *Cf.* 'Our experience with hypermedia seems to indicate that without a pre-defined conception of the work, e.g., the plot line of a story, we may have little hope of making sense out of *hyper-recombinance.* This is a particular problem when we attempt to use hypertext to build a new form'; my emphasis; *see:* <http://www.id.iit.edu/visiblelanguage/Feature%20Articles/ArtofMemory/ArtofMemoryPt3.html>

a new orality by paralleling the system of information retrieval and a notion of 'textual dispersal'[48], only providing an automation of this process, rather than depending upon a human network of knowledge; the capacity to recite sections of texts verbatim. I will return to their arguments later when I begin to analyse specific games. Wong and Storkerson have also suggested that many of the mental models and analogues we deploy when discussing or describing the processes of computers, tend to mirror older, pre-existing systems and metaphors:

> 'Our understandings of computers, for example, are shaped by myriad metaphors, or models defined elsewhere that we apply in order to interpret. Similarly, words grow by developing new figurative uses by which we understand new situations through comparisons with older ones: "I dropped the board." "I dropped the class."'[49]

Their comments seem to parallel a process observed by Bolter and Grusin (1999), *remediation*: a suggestion that a medium within our culture can never operate in isolation, because it must enter into relationships of respect and rivalry with other media. Literally, we understand new media through their comparisons with older forms of media. It is certainly the case that our understanding of computers follows a schematic logic: flow charts, diagrams, maps and acronyms are all employed to explain – and help us to understand – *how* computers work. In terms of computer programming, then, mnemonic systems were introduced as a means to help programmers to remember functions they would need to perform repetitively; it seemed easier to remember a three letter acronym (or mnemonic) to act in place of a binary command than it was to remember the code structure as zeroes and ones; this process demonstrates a logical means of 'uncovering' a system at base level to make it more coherent to users (*i.e.* programmers) precisely by employing a system of signposting; the mnemonics are of no benefit, or use, to a computer as it has to translate these anyway. They merely function as a set of universal rules, which enable programmers to write code more efficiently.

In *Analysis and Interpretation of the Realist Text*, David Lodge (1996) identifies a further group of theories that concentrate on both the description and classification of techniques of fictional representation. Perhaps the earliest distinction within this area lies in the Formalists distinction between *fabula* and *sjužet*, which deserves some attention as this distinction exemplifies – perhaps more than any other distinction – the difference between *what* the story is, and *how* it is presented[50]: *fabula*, on the one hand is the story in its most objective form: the story as it would occupy real-time and space; *sjužet* concerns itself with the rendering of the story into a text, the editing, the montage, emphasis and ellipsis added as the story is reformatted. As Lodge indicates, this lead Gérard Genette to consider ways in which *sjužet* remodels *fabula* in terms of

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[48] Here they cite Delaney and Landow's theories on 'the dispersal of the text' through the computer's ability to disperse and recombine texts through strategies of referencing, caching and linking (*Ibid*.)
[49] <http://www.id.iit.edu/visiblelanguage/Feature%20Articles/ArtofMemory/ArtofMemoryPt4.html>
[50] I owe much to the post-structuralist writing of Shoshana Felman. In particular, her essay: *Turning the Screw of Interpretation*, where she uses deconstruction to decentre the text, by doing so, demonstrating how easy it is to get wound up in one's own analysis. She asserts a distinction between '*what* the story means and *how* it means' (1982:x). Lubbock and Booth assert a similar distinction: between the 'story' and 'way of telling' (Lodge, 1996:27)

point-of-view: 'perspective' (who sees the action) and 'voice' (who speaks the narration of it)'. In terms of the distorting of *fabula* through *sjužet*, this could occur by means of 'order, duration and frequency' (1996:27) in terms of the representational timeline occupied by *sjužet*.

Narrative, according to Peter Brooks, is one of the largest categories, or systems, of understanding that we use within our everyday negotiations with reality[51]. Specifically, narrative carries with it a problem of *temporality*: 'man's time-boundedness, his consciousness of existence'[52]. Plot, then, is the principal ordering force of those meanings that we try to wrest from temporality' (1984: xi). Events, either real or fictional are known as 'story' (*fabula*) and form the basic material for the creator of a work. Events are then formed into 'plot' (*sjužet*). As a basic organising principle, divisions between *fabula* and *sjužet* are still employed in structural analysis, although ambiguities arise in terms of separating one from the other. If we think again about plot (*sjužet*), we could confuse this distinction simply by arguing that to consider the plot *could* be to consider both the elements of the story and their ordering[53]. It is for this reason that Paul Ricoeur's distinctions may prove useful: plot, he suggests, is 'the intelligible whole that governs a succession of events in any story' (*Cit.* Brooks 1984:13). Having established that, he adopts the terms 'events' (*fabula*) and 'story' (*sjužet*): this definition 'immediately shows the plots connecting function between an event or events and the story. A story is *made out of* events to the extent that plot *makes* events *into* a story. The plot, therefore places us at the crossing point of temporality and narrativity'[54] (*Ibid.*14). This is where we begin to stray away from structuralism; such an emphasis suggests that plot is progressive, active and constructive. This distinction demonstrates a shift away from earlier, more constrained *formal* distinctions in the sense that narrative, when subject to interpretation, becomes to some extent, a dynamic form[55]; one where the reader

[51] *See:* Brooks (1984:3-4) 'Narrative may be a special ability or competence that we learn, a certain subset of the general language code which, when mastered, allows us to summarise and retransmit narratives in other words and other languages, to transfer them into other media, whilst still remaining recognisably faithful to the original narrative structure and message'.

[52] Interestingly, more recently critics, such as Brooks, and 'neo-formalist' writers such as David Bordwell and Kristen Thompson, offer the term 'narrative' seemingly in replacement to the formalist *fabula*, the term 'story', although they admit that they distinguish between *narrative* and *story*.

[53] In this context, this could be seen as the role of interpretation of plot; the interaction between drawing out the plot (or reading) through both *fabula* and *sjuzet*.

[54] Although Ricoeur's thinking, in some respects, moves beyond structuralism. His early works demonstrate an approach to analysis which works at the intersection of structuralism and hermeneutic theory: he uses phenomenology and psychoanalytic modes to question structuralism's position towards elements of 'human agency' (such as identification, ego, viewing positions *etc*.) within critical response. Hermeneutics has already been put forward as a potential tool for the analysis of AI systems. *See:* <http://www.ai.mit.edu/people/jcma/papers/1986-ai-memo-871/section3_7.html>

[55] Working from Freud's 1937 paper *Constructions in Analysis*, Brooks uses the analyst / analysand dyad to crystallise an ongoing [interpretive] relationship between *fabula* and *sjuzet* – between events (real or imagined) and their significant ordering (1984:321). This distinction, he argues, becomes even more critical in narratives where the reader is called upon to participate in the telling and the completion of the narrative in order to make it fully hermeneutic. This distinction becomes perhaps more relevant when we consider an attempt to rescue meaning from passing time; a process of reading, working through and reconstructing – elements which characterise the literary text, defining the 'text-as-read' but can also be applied, I think, to an interactive situation - when a section of a game (as read) is worked through systematically: as an alternation between interpretation and the production of fresh

undertakes an active role in its *understanding*, the creation of *meaning*, alters the way we may think about it, through the displacement of the original text into a new discourse. The text, of course, does not change. Ricoeur suggests that 'to bring into language is not to change it into something else, but, in articulating and developing it, to make it become itself.'[56]

In consideration of cinema, Bordwell and Thompson (1997) suggest that ambiguities between what they define as *fabula* (story) and *sjužet* (plot) arise due to an overlap between both elements, suggesting that one cannot easily be distilled from the other, as both root into each other: 'the story goes beyond the plot in suggesting some diegetic events we never witness. The plot goes beyond the story world by presenting non-diegetic images and sounds which may affect our understanding of the story' (1997:93). Bordwell and Thompson use *fabula* and *sjužet* to demonstrate a way in which an existing literary model can be transposed onto a slightly newer form: cinema. In effect, they demonstrate that cinema *expands* notions of story and plot by its own recoding of narrative space, the space in which the film takes place - hence, they equate plot and story with diegetic and non-diegetic events)[57]. So cinema's own narrative space differs from earlier forms because events can be implied or suggested through the use of non-diegetic events, such as the addition of sound which is clearly external to the mise-en-scene of the film.

So tools used for formal analysis can be applied to 'narratives' such as those found in cinema, if they are defined carefully enough[58]. In *Film Art* (1997:95), Bordwell and Thompson employ a style of hierarchical topology to tabulate a blueprint for the component elements of the detective movie; a literary genre also analysed by Barthes, chosen precisely because of its obvious structure and practical formulaic configuration[59].

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material. The main difference here between narrative and interactive media, is that within, say a detective story, the *sjuzet* should be so tight that only one *fabula* can easily be extrapolated from the interplay; within the digital realm, this becomes paramount; in consideration of 3D style puzzle games, such as '*Doom*' style variants, actions must be taken in order for the game narrative to progress – literally, subsequent narrative elements need to be digitally 'unlocked' within the space of the game, either through acquisition of keys or completion of puzzles.

[56] *Cited:* <http://www.brocku.ca/english/courses/4F70/ph.html>

[57] **Diegesis:** 'The denotative material of film narrative, it includes, according to Metz, not only the narration itself, but also the fictional space and time dimensions implied by narrative' (Monaco, 1984:428).

[58] Bordwell and Thompson are concentrating upon narrative form: 'a type of filmic organisation in which the parts relate to each other through a series of causally related events taking place in a specific time and space' (1997:480). As with much analysis which lays strong emphasis upon narrative form in film (*c.f.* Mulvey, 1975), this can be mapped onto specific groups of films (or, in Mulvey's case, a specific group of films), although it begins to break down when considered outside the structures it was intended to be read alongside. Bordwell and Thompson's work mobilises a similar framework to that which Vladimir Propp laid out in his *Morphology of the Folktale* (1968), which I will discuss shortly.

[59] Their intentions here are clear, a detective story in this sense seems unambiguous; the narrative begins with an event, which calls for investigation, the detective systematically investigates the agents within the story to piece together a conclusion. In this context, the board-game *Cluedo* works in exactly this way; here the sum of the games' components are configured by a mix of cards (and the assignation of blame lies within the parameters of what exists on those cards; what remains here, is the process of discovery, the uncovering of the case, much like the detective story Barthes' and Bordwell *et al.* are considering.

It is perhaps unsurprising that Bordwell and Thompson's model of film analysis owes so much to earlier formal/structural systems; an examination of Vladimir Propp's analytical methodology[60] can demonstrate this; he deals – quite explicitly – with the reading of 'myth as model' (1968:xiii): synchronic structural analysis which gains its emphasis by virtue of an analysis of stories without concrete origin[61]. In this sense, the tales he analyses are timeless (lacking in historical or even cultural specificity) and also, I think, immediately translatable (from the perspective of language and the point of view of culture). Perhaps the term 'translation' is unsuitable; we could perhaps rightly argue that literal translation of myths into language and cultural contexts did not take place until much later[62]. Much of what is thought of as 'mythical narrative' came into being almost unconsciously; myths may have begun life as trivial stories, *jokes* even. In terms of the unconscious, then, mythology either has a cultural or historical specificity *so* deeply rooted that it is accepted as a natural structure of narrative, or it is so culturally and historically universal that its 'concrete origins' are seldom questioned or always indefinite: merely accepted as fact. Myth, in this sense, operates as its own language: myth, as Barthes suggests, *is* language (1957:11); part of a 'common cultural currency, a cultural heritage, into which we are all (formally and informally) socialised' (Tolson, 1996:5).

Interactive games are structured at the level of language[63]: narrative is encoded into them at many stages of their production and use, so surely part of our response to them operates similarly to our decoding of *any* other narrative form? In this context, we could consider ourselves as approaching a text of any format with a stock of

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[60] Here I am particularly referring to the rigorous analysis provided by Claude Levi Strauss (*See* Liberman [ed.] 1984:167-188).

[61] Indeed, Propp considers folk tales: stories where notions of [the origin of] authorship are not clear. In this sense, these stories have no fixed identity from which to begin reading from; the point I think Levi Strauss is making when he accuses Propp of ignoring the fact that myths and tales 'are 'hyperstructural' and form a metalanguage in which structure operates at all levels. It is owing to this property that they are recognised as folktales and myths and not as historical or romantic narratives'. They employ grammatical rules (syntax). To this end, the term 'King', as Levi Strauss points out, also carries with it connotations of hierarchy and gender, in addition to other permutations – but unlike *historical* narratives these tales have no cultural anchorage in so far as they are precisely operating as the basis for the identity of a culture (*See:* Cameron: 'a people without stories seems as absurd an idea as a people without language (a people with language but no stories even stranger, for what is language for if not to tell stories?)' <http://mfj-online.org/journalPages/MFJ28/Dissimulations.html> and also Barthes: 'Isn't storytelling always a way of searching for one's origins' (1975:47); Freud: 'the case histories I write … read like short stories' (1893/1974:231)

[62] Translation suggests a process whereby something is moved from one place to another. In terms of language (or culture), such a translation suggests the reconfiguration of one cultural myth into the culture (and hence, the language) of another. While this process *undoubtedly* took place, I feel that certain – not all - myths perhaps found origins in several locations independently. See my reading of the origins of the vampire myth for more details <www.sussex.ac.uk/Users/faph3/Vampire.html>

[63] They consist of a series of languages and interpreters all working in tandem. At the machine level, they consist of raw machine code to enable the machine to represent them as best it can, through its own hardware. They are also compiled into code according to the demands of the machine operating system. They are likely to have been developed using visual tools which have developed in a language to suit the operating system; tools which allow for a unified method for compiling additions to the game at a visual level. Finally, they're represented to be *interacted with*; such a process requires a surmounting knowledge of the structure of the game, the ability to respond, to *play*; to read the text.

mythical structures upon which we map narratives as we see them[64]; it is in this sense that *to an extent*, (the extent of selective omission/exclusion at least) Vladimir Propp's set-up *will* allow us to configure films such as *Star Wars*, *The X-Files* and *The Matrix* (among others) along the axis of his 31 functions[65]; although such an analysis sits outside the scope of this chapter. This is no coincidence; all the above listed films have plots which, to a degree, find their roots in mythology. In this context, it is possible to allow these functions to partially govern the narrative flow of a game[66]. Put quite simply, it is unsurprising that the software applications game houses use to structure interactive games function along lines which bear striking resemblance to Propp's lists of functions; such software is most likely to take the form of a 'Graphical User Interface' based application where something like a sentence is structured in code, as visual objects with characteristics selected from a range of functions, are placed into the *mise-en-screen*, or space of the game[67]. All objects in a given game are encoded with certain behaviours, or parameters. In fact, the overlap in terminology even feels similar; agents become objects, which can be hierarchically mapped according to their properties, or functions within the narrative (and hence their properties within the space of the game)[68]. In this sense, we might be forgiven if we would expect to be able to generate quite effectively, a topological plan to describe the function of elements within *certain* selected games. Indeed, a very precise hierarchy can be effectively mapped in terms of these properties, with little logical ambiguity; interactive media in the form of games are 'read' at the computer side through a chain of commands that obey logic, whilst many are 'encoded' through GUI-based software which organises objects and functions through a process of selection[69]. Both these processes contribute – if *successful* – in an interactive scenario, or structure, which is governed by rules and laws which function according to principles of logic[70].

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[64] Literally, this could be signified by the describing of a given text through narratological identification and classification: 'it's a love story', or 'part detective and part horror story'.

[65] *See:* Propp (1968:26-63).

[66] This demonstrates the flexibility and power of applying Propp's typological analysis to *any* given text. Its strength lies in its existence as a set of general rules; as Levi Strauss remarks, his analysis of folktales constitutes a reading at a 'molecular' level. Hence, a sentence which reads 'a dragon abducts the King's daughter', can be decomposed into a number of interchangeable elements – divided into variables and constants, actions and functions. In this sense, an algorithm can be set into place to transfer all of the elements into a formula. Propp laid the foundations largely on the basis of research undertaken by other classificatory papers on folk-tales, especially those of Aarne. His approach remains valid, because it functions at such a base level. Indeed, 'In any field of knowledge, classification is the basis for and prerequisite of in-depth study' (Liberman 1984:39).

[67] In this sense, game production takes the form of 'narrative as methodology'.

[68] Here I am considering the factors that make the characters what they are: firepower, strength, ability to cast spells etc… All this depends on the *genre* of the game. Even in terms of what they are worth when interacted with for the player – they may need to be killed in order to get something (I'm thinking of *Doom*), or may have a bounty (in terms of internal game currency for progression *cf:* Elite-style / C&C), or may simply be worth points (space invaders: aliens and UFOs)

[69] Here I use the series of *Doom* games to set an example: we accept the fact that gravity will hold us to the floor. In *Doom*, 'gravity' exists through an analysis of difference between presence and absence; if the floor exists under your feet, you can stand. If a floor doesn't exist, then you will fall until your feet touch the floor. All games embody their own notion of physical laws, which govern what *can* and *cannot* be done at any given time: these can be divided up into variables and constants.

[70] However, I will address what happens if the 'play' of games is considered as *parole*, not *langue* at a later stage, when I begin my analysis of games in section III.

In 1960, Claude Levi-Strauss set out to critique Propp's work, 32 years after it was first written. His aim was to distinguish between formalist and structural modes of analysis. Propp's approach has been described as syntagmatic analysis, whereas Levis Strauss had suggested his approach works along the lines of paradigmatic analysis[71]. Both analytical frameworks are generally understood to have found their origins in differing schools of thought, although much of the difference between their styles can be accounted for through the differences in time between them and perhaps, the differing political, cultural and social contexts within which they were written. Propp responds to this critique by announcing that Levi Strauss has a comparative advantage; he is a philosopher, Propp an empiricist (Liberman 1984:68). Although it is arguably the case that both critics reserve interests in Marxist ideology, it is apparent that their circumstances are different; Propp, by nature was required to subscribe fully to these principles; to use Marxist quotations without question, to ensure they were always rendered in a satisfactorily positive light. Levi Strauss, on the other hand, had more flexibility; to use Marxist criticism was to use another set of academic tools. Perhaps this best explains the difference between the 'philosopher' on the one hand, and the 'empiricist' on the other.

However, Levi-Strauss's criticism of Propp does offer some useful analytical indicators; as he explains: of Propp's 31 functions, several can be further reduced to the same function reappearing at different moments of the narrative but after undergoing a number of transformations. His criticism demonstrates this by inverting the functions of certain characters, whilst allowing for his own rules; in this sense, these inversions are what make his own structural reading; perhaps best indicative of the shift from the syntagmatic to the paradigmatic forms of analysis. His resolution was to construct a matrix scheme with two or three dimensions (to allow for such inversions of characters)[72]. In this sense, Levi Strauss is thinking along the lines of Boolean algebra – the lines upon which computer logic functions.

To 'read' a game at such a level could imply a reading of the code at machine level and discussing it; something which 'game theory' has addressed for many years[73]. Whether justice could be rendered to such an analytical model – whilst avoiding the

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[71] According to Levi Strauss's (1960/1984) logic, we can understand the difference between formal and structural analysis through two terms: *syntagmatic* – which concerns itself with the analysis of syntax and structures; hence Propp's style of delineating the structure or organisation of a folklore text. In this sense, *syntagmatic* analysis is a sequential mode of representation – much like syntax of language. *Paradigmatic* analysis, on the other hand, concerns itself with the mediation of polar oppositions (life / death, male / female); which are mapped into a *paradigmatic* matrix. In this sense, elements are extracted from a linear text and subsequently regrouped. The crux lies precisely in this difference: the goal of syntagmatic analysis is to expose the underlying sequential structure of a text (from A to Z); whereas Levi Strauss suggests a process of looking beneath the *syntagmic*, rather to build the *paradigmatic* structure from its content.

[72] In *Image, Music,* Text, Barthes (1977:86) alludes to Todorov's notion of the story, to be read as storeys of construction (as a building or a computer [database] array) – offering the view of narrative as containing the dimension of a 'hierarchy of instances' rather than a spreadsheet model, with boxes to tick when characters behave in a structurally conformist way.

[73] *See, for example:* Levy [Ed.] (1988). The book is essentially a manual for computer programmers, numerologists or mathematicians.

same criticisms that Levi Strauss has caught Propp in – is another issue; if we understand the fact that interactive forms, such as computer games, already have a *solid* structure in place (in terms of their consistency as lines of code), then to reduce this into a model for analysis means to re-compile the code into some kind of short-hand. Although this does risk the alienation of the original code: at it's base level it is meant for reading by computers, as a string of logical commands; whereas at lower levels it becomes rendered more easy for humans to understand. In this sense, I am suggesting that it may be ineffective to look at the code as 'sets of rules' for humans to understand, *unless* we are considering the 'user' and how they use the 'rules' within the game to benefit, or change, the way they interact with the piece. This, of course, is moving towards a question which I intend to address later: how relevant are the tools used to *build* games to the games themselves? In this sense, my question will not literally address 'code', but will shift towards an examination of the modifications (mods) that users create to adapt and change the game.

Propp's analysis, then, *is* problematic; by restricting itself to the rules that govern the arrangement of elements it loses sight of the fact that no language exists where vocabulary can be deduced from its syntax. Levi Strauss suggests that: 'The study of any linguistic system requires the cooperation of the grammarian and the philologist'. Which begins to indicate a need for a shift towards modes of thinking which incorporate ethnographic observations into the fabric of their analyses.

Barthes' emphasis can be best understood in terms of what we, as readers, may take to a text before we *begin* to examine it. It is in this manner that he represents a step forward from Propp. As his work functions under the rubric of structuralism, his claims function to analyse objects with a similar goal in mind. However, Barthes approach seems somehow more wholesome; the nature of any given element in a story has no significance unless it is read alongside all the other signifying elements. In this sense, his work seems to shift towards the proposition of a layered matrix approach to structuralism, implying that the idea of 'concrete' foundations upon which a structural analysis takes place cannot be absolute; there are considerably more variables to consider at outset even before thinking about the text in any light. These variables perhaps at the most basic level would take into account some of the possible pre-conceptions that could be taken to any given text, and these may initially depend – and differ – through cultural conditioning. In a given analysis, then, Barthes will typically present his case using certain objects and terms, offering when he does, *sets of rules for analysis*, stating that these could be substituted easily with others to achieve slightly different effects, although always attempting to *acknowledge* what the process of interpretation is striving to achieve. In this sense, if Russian formalism can be viewed as a *reaction* against the deeply rooted notion that *content* is superior to *form*, the latter being viewed merely as a recipient, then Barthes' proposes the notion that at any given time in analysis, content may take precedence over form (and vice versa), but neither can be strictly marginalized – and if one is, then it is of preferential analytical discredit to that which it is suppressing.

However his analysis, for me at least, serves as a warning: when you describe something (in this case a photograph), you inadvertently change it's meaning through your own emphasis (1977:26). Can such analysis be avoided? Perhaps not: to

comment upon something is to load that object with new meaning – therefore, when Barthes considers the photographic image, he credits it as being the possessor of two signs: one without a code[74] and one with. Furthermore, what he terms as a 'parasitic relationship' exists between words and image[75], as the image loads the text with meaning (and vice versa). In this sense, as with the differences between interpreting *fabula* and *sjuzet*, a preferred reading should be emphasised by the interplay between the signs (as one signifies the other) and so a stabilised reading (rendition) in this light, is provided, stable enough not to be warped by any subsequent decoding. If an image does 'load' new meaning onto a piece of text, then a second set of signifieds develop as a result of the combination of image and text. In this sense, textual 'meaning' is generated iteratively: as more elements are added to a composition, different sets of signifieds will develop as a result.

What needs to be decided here, is whether what is deemed a 'work of art' can be reduced to a system of significations (a shortfall of this type of analysis lies in a question of *context* of the analysis taking place: *who* is making the analysis, and for *whom* etc.). Here we see two similar systems for analysis, where the contents which make the 'text' are constituted either by a universal symbolic order (*c.f.* Propp) or by a period rhetoric (based on the assumption that an historical axis exists; in Barthes work this is generally the case), or in short, by a stock of stereotypes: an inevitable syndrome at both sides of production and consumption – and perhaps for this reason, completely unavoidable. As Propp's response to Levi Strauss's critique suggests, a reading which occurs across two widely disparate cultures can result in both parties seeming confused – or disappointed at least – over what the other had to say.

Barthes is moving towards the articulation of a division between 'textual effects'; there exists, for example, a difference between *aesthetic* effects and *signifying* effects within a narrative. In this context, meaning constructed from a photograph is thus always historical; it depends on the reader's previous knowledge and experience (1977:28), therefore intelligible only if one learns the signs. Such learning, then, requires a structural process of categorisation[76]; Barthes argues that there can indeed

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[74] This coding takes place in two senses: *denotation*: a literal interpretation of the signifier; and *connotation*: wider cultural associations made against the signifier which 'change' the reading.

[75] However, we must bear in mind that Barthes has a specific *form* of (or representation of) a photograph in mind – the press photograph. He suggests that the object's meaning is constructed in conjunction with text, as a caption: 'the totality of the information is thus carried by two different structures (…) [which are] co-operative but, since their units are heterogeneous, necessarily remain separate from one another' (1977:26). Both of these images are indeed autonomous - and need not be related, although both contain meaning - *meaning itself* metamorphosises, or is focused, by a kind of oscillation between the two structures – both vying for meaning, but perhaps more closely crystallised in unison: 'Moreover, the two structures of the message each occupy their own defined spaces' (*Ibid.*27) So the relationship between the two structures lies in the decoding of one in relation to the other, for the correct reading to be forged: 'of the two structures, one is already familiar, that of language [but not newspaper-language], while almost nothing is known about the other, that of the photograph' (*Ibid.*). Yet later on he explains that a photograph is reliable because it conducts mechanical capture of a scene, producing an effect of *having been there*: 'for in any photograph there is always the stupefying evidence of *this is how it was*, giving us, by a precious miracle, a reality from which we are sheltered' (*Ibid,*73).

[76] Primarily we could consider Levi Strauss's (1960/1984) idea of structuring analysis through the casting of opposites. We could also consider Melanie Klein's early studies of child psychology. Klein

be *no* perception without categorisation. He later alludes to the notion of (or rather, his *perception* of) 'Arabness' encapsulated in a photograph of Agadir in ruins. All this really justifies, however, is that signs are *arbitrary* in nature; signifiers float and, although signification can – to an extent – be anchored, there is little control over a solid reading and hence, the occurrence of mis-readings becomes an inevitability. So Barthes issues us with a warning: 'In order to determine the initial narrative, it is therefore vital never to lose sight of the functional nature of the segments under consideration' (*Ibid.*36)

This could bring us back to square one; if the kind of analysis that Barthes applies to cultural objects is to be mapped onto interactive games, then we can take his ideas on board, without necessarily producing anything substantial. In any case, what Barthes does allow for – which Propp denies – is perhaps a discussion of the context in which the object is *used*, and a charting of the phenomenon of the object as a text in its own right, but more importantly, as an artefact with a 'biographical' history[77] and as a cultural symbol.

The notion of *what* an object symbolises, then, is far closer to my line of enquiry; I am interested not so much in what the code of the game *does* (literally in terms of 'machine code') but more in what that code – once compiled and used – expresses about the culture that consumes it; what forms of interaction or identification are taking place within a single player game? And how might these differ from other games in different genres? What does it mean to play a game against other 'human' players? Do such notions change when you are no longer interacting with a machine, rather *using* the machine to challenge others in terms of skill? (Indeed: *using* the machine to outwit one's opponent).

The point at which Barthes and Propp's thinking overlaps – and hence a distinction requiring engagement – lies in the notion of myth; the mythologies embedded within objects of study. Barthes suggests that: 'Myth (…) must be included in a general theory of language (…) [and] is present everywhere *sentences are turned* (…) from newspaper article to political sermon, from novel (if there still are any) to advertising image – all utterances which could be brought together under the Lacanian concept of the *imaginary*' (1977:168-9). To what extent, then, is our understanding of 'myth' adapted by games? And how do such myths change within multiplayer games? A brief examination of the differences between photography and cinema may provide a starting note: 'film can no longer be seen as animated photographs: the *having-been-*

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had believed that the child aligned its own identity through the articulation of a division between *good* and *bad* objects in order to express desires. Such a model – seemingly popular with structural analysis - can be related to interactive games in terms of recognition of 'good' and 'bad' objects within the space of a game. Hence, an understanding of the functioning of an interactive game is informed through a surmounting knowledge of such rules. Tactics are built by dealing with both 'good' and 'bad' objects effectively.

[77] We must be cautious over how we embrace this discussion; firstly, 'biography' in my context is the background within which the object is set (politically, culturally etc) – which may explain how the object *came into being* offering us a clue as to why this is so. But it strikes me also that objects themselves have biographies to be read – i.e. second-hand cars. We must also consider what happens when the object is *interacted with* and then, whether the object's own history is indeed important if the user has no knowledge of it. Then, there is the user's own history, as Barthes acknowledges.

there gives way before a *being-there* of the thing; which omission would explain how there can be a history of the cinema (…) whereas the photograph can in some senses elude history (…) and represent a flat anthropological fact' (*Ibid*.45). If we are to consider the notion of 'multiplayer', 'player' or 'participant' in relation to cinema, how do these notions affect the tense of 'being' involved, and how does that history become *enmeshed* or appropriated? If photographs *can* elude history, do aspects of gaming *also* have this effect? All of the above questions will need to be addressed again in sections II and III, when I consider 'spaces' and 'game forms'.

2. New Convergences: Digital Narratives and Cinema Theory

'The computerization of culture not only leads to the emergence of new cultural forms such as computer games and virtual worlds; it redefines existing ones such as photography and cinema'
Lev Manovitch: '*The Language of New Media*'[78]

Did the computer eat Hollywood?

Lev Manovitch, alongside a number of other 'new media' theorists[79], increasingly argue for the identification of a trend in which cinema – among other existing media forms – has become redefined in the wake of computer-mediated-communication; much of his emphasis is on the *interplay* between cinema – and indeed, other existing forms such as photography – and digital technologies, *including* interactive games.

My intention now is to consider just how far we can take Manovitch's insightful comment by launching an exploratory study into the development of film theory from its highly structural and controversial *Screen* phase in the 1970s, to the development of more recent branches of cinema theory – in particular those which consider the *technical growth* of cinema and its related technologies – to consider the current state of the now highly converged hybrids that are in operation today. Before I navigate back to a *brief* acknowledgement of the historic basis of film analysis, I would like to open with the rather obvious premise that film as a technological and apparatus-based form, has not remained static; we can still consider early films like *Man With a Movie Camera* (Vertov: 1929) [80] and *Metropolis* (Lang: 1927) [81] today because throughout their lives as artefacts on magnetic tape, they have been salvaged and recopied time and time again by people insistent on their preservation. Indeed, both are now archived – and available commercially – in the popular digital MPEG-2[82] based format: the consumer Digital Versatile Disk, or DVD. This transition - from a reel of magnetic film to a stream of digital information - lies at the heart of what I want to consider in this chapter: how technological change has influenced the ways in which media can be thought about or consumed. Both Lang and Vertov's films have been considered as pioneering works and both have been used to demonstrate the case for film theory – and this is arguably (if not cynically) probably the major reason their work has survived: both encouraged academic debate and both directors have been held as seminal avant-garde artists by academics and film enthusiasts. Although both have died, their work has been prevented from deterioration through consistent

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[78] *See:* Manovitch (2001) *and* <http://www-apparitions.ucsd.edu/~manovich/LNM/Manovich.pdf>. *See also: The Computer that ate Hollywood* (BBC: *Horizon* 1997) – a television programme which also explores this premise. <http://www.bbc.co.uk/science/horizon/specialfx.shtml>

[79] *See:* Andy Cameron (1995), Anne Friedberg (1994), Andrew Darley (2000), Angela Ndalianis (2000), Stephen Poole (2000), to cite a few academics. Much of this work has been published this year (Ndalanis, Poole, Darley) although work stretches back to as early as 1995, when Cameron's paper first appeared. *See:* <http://mfj-online.org/journalPages/MFJ28/Dissimulations.html>

[80] *See:* <http://www.nottingham.ac.uk/film/journal/filmrev/man-with-a-movie-camera.htm> *and* <http://www.bfi.org.uk/bookvid/videos/dvd/moviecamera.html>

[81] An *excellent* overview of the film can be found at: <http://www.uow.edu.au/~morgan/Metroa.html>; this site carries the debate much further through the collation of *all* known information regarding different versions, edits and releases of the film: <http://www.persocom.com.br/brasilia/metropo.htm>

[82] *See:* <http://www.erg.abdn.ac.uk/public_html/research/future-net/digital-video/mpeg2.html>

techniques of preservation; and preservation takes time, expertise, money and exceptional patience.

The point is that at key stages, information - as was *initially* captured by Vertov and Lang - has been re-compiled, re-edited and converted into formats, which exceed and differ from the shadowy analogue forms of the 1920s. The best technology available at any given time from the 1920s onwards has granted their preservation; allowing re-duplication, clip restoration, mastering and re-editing. Finally, both were captured, cleaned-up and compressed when they were released 'with a host of *new* features' on DVD in 1998[83]. In other words: monumental changes have occurred in how film is transferred, transmitted, received and understood; indeed, their films are now sold as consumer items in shops: something that in the 1920s, both Vertov and Lang would have had difficulty imagining.

Alongside such technological changes, academic film theory has shifted, by doing so, addressing emergent new forms of distribution; new patterns of consumption and a new film 'language'; key terminologies identifiable in the converged media. I am concentrating on changes in film theory for several reasons: firstly, it is my suggestion that such understanding will lead to a clearer conception of what interactive games are like; secondly, that the interactive game industries now function increasingly similarly in the ways in which they approach game design and production; thirdly, that there is an undeniable synergy between film on the one hand and games on the other[84]; finally, academic study has developed a language for critiquing film. This language is constantly changing and as it does, its motives for doing so are justified by arguing that through shifts and changes, previous methods for analysis appeared inadequate; unable to synthesise a coherent logic in an arena of converged media. It is my intention now to consider briefly some of the changes in academic film studies, starting from the 1970s *Screen theory*, through opposing perspectives in film analysis and into current theories on the digital *converged* media forms.

Screen theory: a brief history

Throughout the 1970s, much film analysis centred on what became known as 'Screen theory' a semiotic-inspired, psychoanalytic approach geared around how people view films in the cinema. Its approach was frequently concerned with an understanding of the cinematic apparatus as central to the viewing experience; the darkened cinema and the projections onto a space in front of the spectator for them to gaze at, by doing so, forming chains of identification through one of a series of viewing positions articulated by both the film's content and the cinematic apparatus.

For Screen theory, then, an understanding of cinematic space has been codified in terms of *diegetic* space – the *space* within which the film takes place[85] and the space responsible for structuring the *ensemble* of screen, the spectator and cinematic

[83] This is certainly the year for initial releases in the US; *Metropolis* was released in the UK in 1999 – subsequently deleted in 2001 – and *Man With a Movie Camera* was released in 2000.
[84] Some of the most known synergies could comprise of rights for: *Tomb Raider, Resident Evil, Dune, Star Wars, Harry Potter, Street Fighter, Final Fantasy*.
[85] Another term used to describe this spatial arrangement is the French '*mise-en-scene*'

apparatus[86]. Although both spaces are separate: diegetic space concerns the film *as* text, whereas spectatorial space concerns the metapsychology of cinema (*see* Heath, 1976; Bordwell, 1985) screen theory works at the intersection between diegetic and spectatorial space; where narrative form, the reality effect and architecture of the cinema all work together (*see* Metz, 1980; Manovitch, 1999:184).

It is only when such a distinctive viewing situation is made open to the spectator that the cinema can *most effectively* relay its meanings and subjectivities; these are produced by specific cinematic apparatus:

> 'The extreme contrast between the darkness in the *auditorium* (which also isolates the spectators from one to another) and the brilliance of the shifting patterns of light and shade on the screen helps to promote the *illusion* of voyeristic separation. Although the film is really being shown, is there to be *seen*, *conditions of screening* and narrative conventions give the spectator an *illusion* of *looking in* on a private world' (Mulvey, 1975:114; *my emphasis*)

Screen theory remains a contested area of study; as Laura Mulvey's quote suggests, it examines the spectator/screen relationship exclusively within the domain of the cinema; the experience of viewing a film is intrinsically linked to the *effect* created by the apparatus. It also shares a highly specific relation to the approaches of structuralism which I mentioned in the previous chapter; the 1970s screen theory largely remained the *structuralist* period of film studies: influenced as it was, by de Saussure's linguistic approach to language which I mentioned in the previous chapter; Lacan's analogous account of the mirror phase[87] in childhood; and Antonio Gramsci's Marxist concept of hegemony, or dominance. It was a mode of analysis, which suggested that the reader was *passive*; and locked into the text through wider culturally-mediated and hegemonic 'meaning'.

Another argument raised against Screen theory is that it was 'historically and culturally specific' (Kuhn, 1999:7); a set of structures which made certain assumptions about *how* people watched films. Time has seen many alterations to the cinematic apparatus; now redefined in an age of DVD and pro-logic home cinema, digital delivery of pay-per-view services, wide-screen technologies, THX mastering, computer rendering and IMAX films. In other words: the cinematic apparatus remained the dominant mode of cinema delivery and reception within the 1970s, in an age before the proliferation consumer home video, the subsequent changes in viewing patterns and the growth of reception theory. Of course, film theory stretches back to before this time; although the 1970s is when we can credit a unified and collective language as being developed, one which was contested and developed and, perhaps

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[86] The cinematic apparatus can be thought of as all of the elements within the cinema (including the building itself) which allow for the experience of film viewing.

[87] *See:* Stam *et al.* (1992:128-9). The infantile subject comes into being (*ego formation*) through identification with an image of its own body. This image is internalised as an *ego ideal*, which provides the basis of all subsequent identifications, which are imaginary in principle and which 'situates the agency of the ego, before its social determination, in a fictional direction'. The Imaginary 'one of three psychic registers regulating human experience' involves 'a narcissistic structure in which images of otherness are transformed into reflections of the self'; Lacan argued this phase was one of the key stages for 'identification' in the cinema (1992:130).

more importantly, one which *began* to address the relationship between the viewer and the screen.

So changes in technology began to prompt new ways of thinking about that particular technology in the context of a relationship between the *text* and the *spectator*. As new markets opened up, new theories were introduced; the most significant opposition to Screen theory was reception theory, which rejected the premise that meanings were fixed and that viewers were passive; instead it argued that viewers took more to films than previous theories had cared to admit. An easy way to consider this change is through a convergence – or rather: synergy – between markets; something which was not happening in the 1970s in the scale we see it on now. When we think of films now, we *might* think of a viewing of the film in relation to a cinematic apparatus; but we might equally think of all of the markets which simultaneously feed into creating a wealth of epiphenomena (*See:* Klinger, 1989) around a product; so, to coin an obvious (and still perhaps the best) example: to think of *Star Wars* could also be to think of children's toys, books, posters, CDs, games, clothes, stationery, fan websites, publications, promotions by large chain stores. In other words: a wealth of information is situated around the film itself, the film becomes just one element within a wider-culture; the film becomes its own microcosm or meta-narrative, with a plethora of other cultural objects orbiting around it. In other words: texts could no longer be considered in isolation; this was the fundamental breaking point of screen theory: 'we can understand filmic signification only as it is imbricated in diverse ways with other media, past and present, its circulation within the *array* of cultural production mediating the semiotic and ideological resonance of any text' (Collins *et al.*, 1993:4). Multiplicity and contingency seem to be the watchwords for a new approach to such signification: for film theory to work in an honest and accurate way, then the suggestion here is that it must consider the audiences *active* negotiation between integrated media markets and viewing positions within the text itself.

Digital Convergences

Synergies demonstrate the interaction between markets; several markets channel into one delta surrounding a cultural product. In terms of technology, another delta is also created through digital convergence. This is the area I will be discussing for the remainder of this section. Digital convergence can be described as a point where multitudinous forms of data are all channelled into one carrier device; in this case a digital computer. The carrier device – through the use of 'protocols' and coded instructions – is then able to identify the data-type (the form) of that information and process it in a meaningful way.

We see this process taking place within network-capable operating systems such as Microsoft's *Windows 2000* line of products. The software deals with a stream of binary information, pushed relentlessly through a network connection. This information could be images, text, music, video and they could come from machines running on different network 'protocols'; in the first instance, the operating system needs to be able to identify *what* protocol the sending machine uses to communicate *e.g.* Microsoft (NetBEUI); Unix (TCP/IP); Novell (IPX/SPX); Mac OS (Appletalk).

The software has to *know* what these protocols are, in order for it to be able to listen to specific instructions sent to it. Once it is able to communicate with the sending machine, it then needs to be able to identify the *type* of information sent to it: before the information is processed, the data is bundled with 'headers' explaining what that information does and how it is supposed to be decoded or handled. All of this 'handling' requires code for being able to identify and process data as it enters a machine from a network connection.

The Transfer Control Protocol / Internet Protocol (TCP/IP) is the common language which most machines use for Internet connectivity; one of the new advances in this technology has lead to a replacement of the current (1970s) protocol (version 4) with one which is capable of handling more machines per square metre of earth (version 6)[88]. There has been talk in the past of the possibility of a depletion of IP addresses using the current version[89]. The new schema will allow for (6.5×10^{23}) or 655,570,793,348,866,943,898,599 addresses for every *square metre* of the Earth's surface, meaning that any consumer device could be allowed to have one or more addresses: including light-fittings. Digital convergence could ultimately allow a computer or device to communicate with every single item within the house: from switching on lights in certain rooms to checking the 'fridge cam' to see its contents. Much has been written on the politics and changes surrounding convergence already[90]. I am now going to focus on some of the changes this converging of digital technologies might have on our understanding of cinema theory.

The 'new' cinema: what's new?

In *Avant-garde as Software*, one of Lev Manovitch's earlier essays, he opens one of his trajectories of discussion by examining emergent new media forms in relation to the avant-garde of the 1920s. He observes that new media, much like the avant-garde, spawned among other things the desire to explore the '*newness*' of a new style of thought. Among the many publications he cites, all *but* the writings on cinema of this decade expressed within their titles, notions of the 'new'[91] surprisingly, despite the fact that cinema was undergoing perhaps its biggest theoretical shake-up since recent times[92]. All the manifests written during this decade by French, German and Russian filmmakers in their entirety, called for a bound and edited collection, entitled something like: '*New Cinema*', hailing a call for the new language of film: 'whether it was to be montage, "Cinéma pur" (also known as "absolute film"), or "photogénie"

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[88] *See:* <http://www.microsoft.com/windows2000/docs/ipv6.doc>
[89] *See:* <http://news.bbc.co.uk/hi/english/business/newsid_1262000/1262927.stm>
[90] For example, Manuel Castells has devoted a three-volume work to documenting some of the wider ramifications involving this process in explicit detail. *See:* Castells, M. (2000) *The Information Age: Economy, Society, and Culture* (three volumes), Oxford: Blackwell.
[91] *See:* <http://www.manovich.net/docs/avantgarde_as_software.doc>
[92] Two parallel arguments could run here: firstly, that until recently, the apparatus of the cinema has largely remained the same: cameras, film, projection and optics have largely remained stable. The counter argument would suggest that cinema has *always* been experimental: consistently re-defining itself to make itself appear 'new' – every new film claims to offer audience something 'never experienced before' from original 3D cinema to iMax, silent films to digital movies. In this sense, the 'new' becomes something which is just there to be expected; or there is nothing 'new' about the apparatus, just new content.

Similarly, although not declared in a book, a true visual revolution also took place in graphic design thus "making it new" as well (Aleksander Rodchenko, El Lissitzky, Moholy-Nagy, etc.)'[93]; for some reason, such a book was never published.

His premise laid out, he then moves towards the growth of work in the 1990s purporting to comment upon the 'newness' in everything concerning media *in general*. This term 'new', as Manovitch suggests, serves as a short cut for all emergent cultural forms that depend upon digital computers for their distribution (*for example:* CD-ROMs and DVDs, web sites, computer games, hypertext, *multimedia* and hypermedia applications). Beyond its initial, blandly descriptive meaning (the media of all things *new*), the term also carries with it a similar promise to that which animated the above mentioned books and manifests from the 1920s: that of the 'radical cultural innovation now taking place'[94]. Manovitch continues his rather deterministic endeavour by justifying his own parallel drawn between the 1920s and *new* in the 1990s onwards; he is clear in stating that the '20s harboured a 'revolution in art' in relation to the '90s sudden technological 'revolution'[95]. This axis is useful insofar as it highlights the fact that significant technological change has been underway; not least where digital mediation of 'film' seems to have really taken hold. Manovitch is quick to identify this change as a revolutionary period of history where the changes seemed so significant that suddenly everybody wanted to talk about changes: hence the fetishistic prefixing of the word 'new' onto the emergent digital forms.

It seems that to subscribe to Manovitch's theoretical framework is to accept that a unified change has indeed occurred within *every* sector of the media[96]. This is clearly

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[93] Manovitch's argument places emphasis upon Russian montage (Eisenstein) and the radical avant-garde cinema of Germany in the 1920s. When I had initially considered 'avant-garde' (in the context of *cinema*), I was tempted to consider a shift which occurred slightly later, towards the 1950s and 60s within France (the *New wave* cinema of Goddard, Bresson, Truffaut *etc.*) and academic writings on changes in British Cinema toward the 50s and 60s (*See:* Barr, 1977). However, Manovitch is identifying an earlier wave of shifts: French Impressionism and Surrealism (1918-1930), German Expressionism (1919-1926), and Soviet Montage (1924-1930).

[94] From the point of view of mass communication, Manovitch identifies the 1920s as the key decade. Between the second half of the 1910s and throughout the '20s, all *key* modern visual communication techniques were developed: photo and film montage, collage, classical film language, surrealism, the use of sex appeal in advertising, graphic design and typography.

[95] As Moore's law has shown, this 'technological revolution' can perhaps be seen more effectively as an evolutionary phase; Moore's law states that technological capacity doubles every 18 months; something which Intel have assured us will 'hold true' for the next ten years; *see:* <http://www.frontier.co.uk/press/articles/gdc2002-5yrsfromnow.ppt>. Manovitch, we can be sure, is fully aware of this. What I think Manovitch is really talking about is the cultural dawning of a slow process as more uses become found for it; if we are to follow the statistics, we find (as Manovitch himself also enthuses) that the rapid growth of *use* within the area of new media (*especially* growth of Internet use), can partly (or only) justify the technological rhetoric. If we look deeper, we could perhaps be forgiven for thinking that this 'revolution' in media is one concerning not necessarily *content* (for the moment at least, let us consider this), but primarily *storage* and *retrieval*.

[96] This statement poses undeniable questions. One example which addresses the *blanketing* of change over all media is to consider radio broadcast: one of the most established, far reaching, and heavily used forms of media. If we consider the changes in delivery (especially in the case of short-wave) then we find that little has changed since its inception; the transmitters remain largely the same, because they have always functioned adequately for increasing demand. In terms of content, consideration of

not so; and in all fairness, Manovitch is not staking his claim along these lines. Instead he argues that the 'computer revolution' seems unaccompanied by any significant innovations on the level of communication techniques: 'while we now rely on computers to create, store, distribute and access culture, we are still using the same techniques developed in the 1920s' (*Ibid.*). Which sets up a significant question: if communication techniques have remained largely the same, then, how has the intervention of new technologies into cinema changed the way we can think about the form? Where can we *see* change? What functions has cinema successfully retained? And what functions show symptoms of change towards new models of representation?

At the centre of this change lies a shift towards the *creation* of computer tools for undertaking the technical tasks within film-making; areas such as architecture, design, photography and filmmaking: all areas that Manovitch had credited the 1920s with developing 'new styles' and techniques for. In this sense, we are not examining cinema in order to uncover the emergence of *radically* new forms, at least not on any scale comparable to the formal revolutions of the 1920s. Rather than acting as a catalyst of new forms, the function of the computer seems to have strengthened – or reinforced – the already existing forms. The *redefining* shift, then, occurs not with cinematic content *per se* but with the seamlessness – the incorporation of a technology – into the process of filmmaking. In this sense, any emergent new techniques that have been opened work in tandem with older methods: tried and tested film techniques – much like those of the 1920s – remain popular in use.

This is not without good reason; creation of cinematic techniques for 'effects' has a history as long as that of cinema itself: any period of film history has demonstrated or embodied new or emergent techniques for visual effect. Indeed, Louis and Auguste Lumiere's *L'arrivée d'un train en gare* (1895) is arguably the first ever example of the visual 'power' of cinema: a 40-second shot of a train moving towards the camera. Audiences were said to have been shocked by the sequence; unable to tell whether what they were seeing was 'real'. Georges Méliès' *La Voyage Dans La Lune* (1902) represented a famous first attempt at cinematic space-travel: this time demonstrating the power of studio based illusionism.

Indeed, what computer graphic (CG) technology has successfully demonstrated regards what can be 'seen' on screen at any time. Andrew Darley explains CG's pursuit as ultimately working to create a so-called 'realism' (2000:7); rendered computer-illusionism that 'looks' real. In this sense, the CG rendering becomes a virtual-studio space: imposing a 'layer' – or layers – over the film itself, adding to the film's *mise-en-scene* that which can't be emulated so cheaply or easily in a physical studio space.

Radio 4's *Shipping Forecast* implies, to me at least, a timelessness which is un-eroded by the technological frenzied change. Additionally, Digital Audio Broadcasting (DAB) seems relatively unheard of, and although *most* radio content is now streamed over the Internet, bandwidth still cannot ensure the clarity of a sustained (even when buffered) stream of audio data. Consequently, the quality is still at a poorer stage than its analogue predecessor.

In terms of content, digital 'cinematography' *has* created new methods for innovative storytelling; so *Titanic* (1997), *The Matrix* (1999) and *The Crow* (1993) all tell stories, aided by CG rendering; the technique used in *Titanic*[97] allowed the ship to be decked with hundreds of virtual extras within seconds for some scenes, whilst also allowing for an infinite pulling backfrom a fixed point, allowing the spectator to see a seamless movement over the equivalent of two to three 'real' miles; a shot that would be impossible to create in one take using physical equipment. Equally, CG allows for precise frame-by-frame editing, allowing a director to control 'the physics of decimation'; the technique employed within *The Matrix*[98] blends physical studio capabilities with mathematics and digital editing; a studio sequence is shot simultaneously on a circular arrangement of 120 cameras; the resulting sequence can then be played frame-by-frame (from one camera to the next); reversed, sped-up or slowed down. In *The Crow*[99], Brandon Lee's death meant that he had to be rendered digitally into scenes from earlier footage in order to complete the film. The same technique was later used in *Gladiator* (2000) to replace Oliver Reed's character.

Cinematic techniques developed for films have an historical bearing for this reason: the combination of crane movement, flyaway scenery and optical printer effects used in *Citizen Kane* (1941)[100], the combination of simultaneously tracking out and zooming in ('dolly out/zoom in') to create Hitchcock's visual motif for *Vertigo* (1958)[101], all innovated the function of storytelling (through *presentation*) through new possibilities offered by technology at any given time throughout cinema history.

All of these modes of special effect (or *trucage*) add to an ever-increasing repertoire of illusionistic tricks, which complement – rather than replace – the older techniques used by earlier directors. What the new modes of *trucage* do is raise spectatorial expectations: shifting emphasis, as Angela Ndalainis has suggested, toward new forms of visual spectacle: 'a new kind of techno-spatial experience'[102]. This 'new' kind of experience – as Darley has suggested – comprises of a visual archaeology which ranks 'the prevalence of technique and image over content and meaning' (2000:102).

All of this seems to be suggesting that story – narrative – is gradually being surpassed; the narrative cinema of pre-1960s Hollywood which, as Ndalainis has suggested, believed that audiences or spectators were passive, has been replaced by a CG super-charged, fast moving rollercoaster narrative that knows only too well that the audience *are* active: mobilising spectators 'less as readers and more (…) as 'sensualists' (Darley, 2000:173). Films are just breaking off into yet more factions: films with narrative storylines are still made and new stories – like visual techniques – echo older narrative forms; at the centre of *The Matrix* lies a narrative story akin to *Alice in Wonderland*, only it's realised through technology along the lines of Japanese anime. Narrative plays an important, binding role in the film, anchoring all of the

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[97] *See:* <http://www.bbc.co.uk/science/horizon/specialfxtran.shtml>
[98] *See:* <http://whatisthematrix.warnerbros.com/cmp/sfx-bullet_text.html>
[99] *See:* <http://news.bbc.co.uk/hi/english/entertainment/film/newsid_1658000/1658394.stm>
[100] *See:* <http://www.bbc.co.uk/science/horizon/specialfxtran.shtml>
[101] *See:* <http://www.enl.umassd.edu/InteractiveCourse/EThompson/vertigo.html>
[102] *See:* <http://www.sensesofcinema.com/contents/00/5/baroque.html>

special effects into a coherent space; even if we accept that narrative is sidelined at the expense of the techno-spatial 'sensuality'. The popularity of the IMAX 3D cinema format perhaps best promotes the growth of 'sensualist' films: the narratives underpinning most of the stories are sidelined by the visual 'effect' of the mise-en-scene; due to its 3D nature, audiences are placed *inside* the mise-en-scene and are free to look around and explore. By addressing 3D elements, I am now going to suggest that it is in 3D interactive games that we see a prominent interleaving of these two modes of spectatorship: many 3D games now have narrative elements (back story), where the player, or user, is *passive* and the 'sensualist' elements, where the player is *actively* engaging with the text. I will be expanding these arguments further over the next two sections.

Analogue / Digital Interleave

I'd like to try and uncover an area where significant change has occurred. In *Cinema by Numbers*, Manovitch considers cinema at a moment when its history becomes 'poured into computers'[103]. We can consider digital re-mastering of previously released films onto Digital Versatile Discs (DVDs), DivX compression[104]: the technology based upon Microsoft's 'Windows Media' compression, potentially used for piracy, computer remediation of films for CG sequences, *total* mediation of film as in *Toy Story* (1995), the potential for computer mediated advertising of film (and forms of viral marketing) as in *The Blair Witch Project* (1999), the preservation of old and degrading cinema reels as the *bfi* has been responsible for over the last sixty years[105] and finally, the expansion of home cinema technologies such as 5.1 surround amplifiers, plasma screens and Dolby Pro Logic processing. There is a logic to his argument: literally, if all cinema to date becomes archived in this way, we can easily forsee a time when it is all stored, preserved and retrieved by arrays of fast computer servers.

Other less noticed changes could involve more *traditional* forms of film presentation and language: CG rendering, digital compositing, mapping, paint retouching: in commercial cinema, such techniques are used to address *technical* problems, while the old cinematic language remains less changed. Lev Manovitch has suggested that CG techniques are employed but at the same time, oddly guarded: with the intention of creating a form of 'realism' – using Darley's term – with the ultimate aim of creating a seamless intersection, or interleaving, between what is captured on camera on the one hand, and what is digitally rendered on the other:

> 'Frames are hand-painted to remove the wires that supported an actor during a shoot; a flock of birds is added to a landscape; a city street is filled with crowds of

[103] *See:* <http://www.manovich.net/docs/cinema_by_numbers.doc>
[104] *See:* <http://www.divx.com/>. DivX has been described as 'the MP3 of the video world' and essentially is now raising many of the same debates within the film industry that the growth of the MP3 codec caused. The DivX technologies should ***not*** be confused with the consumer failure of Divx – a rival to DVD which functioned on a 'pay-per-view' model rather than outright ownership of the film. *See:* <http://www.techtv.com/screensavers/answerstips/story/0,24330,3368584,00.html>, although the naming of a codec which enables DVD piracy after a failed rival format could be seen as an ironic joke on the part of its hacker creators.
[105] *See:* <http://www.bfi.org.uk/collections/preservation/index.html>

> simulated extras. Although most Hollywood releases now involve digitally manipulated scenes, the use of computers is always carefully hidden. Commercial narrative cinema still continues to hold on to the classical realist style in which images function as unretouched photographic records of some events that took place in front of the camera' (*Avant-garde as software*)[106]

Of course, the *illusion* of 'realism' only works so far: in a film like *The Matrix* we see effects which we recognise as computational; in this sense, what we see, we know *is* rendered and hence the classical narrative style becomes annexed to a variety of newer techniques for storytelling; the events that took place in front of the camera *may* have been digitally remediated to suit the technical demands of the film. So is this the end of the story? Are we making new films as a result of new technical forms? Or is technology just a means to create more impressive visual spectacle?[107]

Here Andrew Darley offers a means to further extend these arguments[108]. In his 1995 thesis, Darley proposed that a new means of image production within contemporary culture is offered through computer imaging. Framing his discussion through Baudrillardian postmodernism, he argues that progression is made towards the 'simulational' aspect of image production; contemporary culture, he argues, relates to a new mode of imaging, which 'simulates' photography[109]. Baudrillard suggests that the key feature of this shift involves a new preoccupation with *form* and argues that cinema is essentially a much more engaging and involving form of media than television, as cinema 'was still a medium which was identifiable as such and could be distinguished from the messages and meanings it contained' (1997:245; *cit.* Darley, 1995:63). He then suggests a process of suturing takes place between TV and life and back again[110]. Where cinematic apparatus are taken into account, then, the difference is understandable; cinema will not function to achieve the suturing effect that TV allows for because of its dependence on the creation of spectacle: an image which is too big for such a process to really effectively take place. We can, however, address the *kinds* of pleasures and empowerment such forms offer to audiences; I shall be concentrating on these notions in subsequent sections.

It can be argued, albeit cautiously, that Baudrillard's postmodernism describes a new visual cultural space which is *formalistic* in regard to its aesthetic character, and where reference to 'the real' is replaced by the limitation and cannibalisation of

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[106] *Source:* <http://www.manovich.net/docs/avantgarde_as_software.doc>

[107] Arthur C Clarke has claimed that 'any sufficiently advanced technology is indistinguishable from magic' (*Cit.* Pavlik, 1996:191); and hence the notion of computer-mediated spectacle and unsurprisingly, the films that it led to, for example: *Jurassic Park* (1993). The 'magic' the technology allows for is in the creation of historical precedents; most people could identify a velociraptor from the CG dinosaur they saw in the film; it *has* set the precedent for what dinosaurs should 'look' like.

[108] Here I am working from two pieces of work within 5 years of each other: Firstly, a 1995 Dphil thesis: '*The Computer and Contemporary Visual Culture: Realism, Post-Realism and Postmodern Aesthetics*' and '*Visual Digital Culture: Surface Play and Spectacle in New Media Genres*' (2000)

[109] This mode of address can be seen effectively in an advert used by Wacom Technologies for their graphics tablet: the artist uses their products to make something abstract look so real that it 'should be a real object' (*Source: PC Pro Magazine*, January 2000)

[110] This is a trajectory that Baudrillard (1995) later follows with *The Gulf War did not Take Place*. My enquiry will concern whether this process occurs between multimedia and cinema.

forms, styles and images from already existing texts,[111] where 'uncoupled domains of representation now exist which appear to float beyond the real world, their meaning dependent upon self-reference and internal differentiation' (*Cit. Ibid.*)[112]. If we were to fully subscribe to this logic, we could suggest that in essence, cinema would be unable to offer us little more than a collage of cannibalised sections of old forms. We could, however credit such 'new domains of representation' with finding their way into the cinema through a blend of human imagination and developments in both pre, and post-production techniques.

Nevertheless, Baudrillard's comments align more closely with TV than cinema, yet his remarks demonstrate that a 'hybrid cinematic genre' – which to an extent has always existed – is emerging; its purpose: to give life to the 'unrepresentable' in film. The hybrid genre exists at the intersection of immersion and spectacle, where narrative is not so much *subordinated*, but certainly compromised, as 'spectacle' takes prominence: re-telling a familiar story in a more graphical context than has been seen before, an example of which could be the recent cinematic adaptation of Tolkein's *Lord of the Rings* trilogy (Jackson, 2001, 2002, 2003)

We perhaps understand the forms of pleasure offered here by considering them as evolving from human expectations, social reflections, anxieties, knowledge of cinematic codes *and* technological possibilities. It seems to me that such forms of pleasure – offered by films dependent on computer technology for the creation of immersive effects - ultimately function to create a new kind cinematic experience for the spectator[113] by using technology specifically to borrow from the root principle of gaming: the principle of 'immersion': creating a spectatorial experience which fuses something like the adrenaline based theme park ride with narrative cinema. I will argue that the blend of techniques cinema embodies for the creation of textual pleasure functions on the premise that pleasure is closely linked to historical expectations[114].

It is from this trajectory that we can begin to chart an understanding of the 'immersive' experience. If such forms of cinema are so technologically-laden, then it would make sense to consider technology – apparatus – as the root at which cinema and gaming theories begin to intersect; with interactive games, however, there

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[111] Frederic Jameson describes the postmodern as 'a periodizing concept whose function is to correlate the emergence of new formal features in culture with the emergence of a new type of social life and a new economic order' (1989:113)

[112] Here Baudrillard's concept compares closely with 'visual atomism': a structural approach to Virtual Reality (among other forms of computer media) principles of modelling and programming; its premise is that: 'if the effect of every simple element is known beforehand, so the logic went, it may be possible to reliably predict viewer's response to complex messages put together from such elements' *See:* <http://www.manovich.net/docs/avantgarde_as_software.doc>

[113] Although cinema has always striven to create the *unrepresentable*; if we think about the early 'picture palaces', it seems that there is a correlation between interior décor and attempt to create lavish cinematic content; both often over-elaborate to offer the *optimum* viewing experience.

[114] This is not to say that early cinema fails to engage with principles of pleasure, but in terms of spectacle (as a narrative drive), development evolves towards the utilisation of technology to create effects previously unseen; part of the pleasure is therefore in seeing, with the hope of *understanding* how it was done (as with the technicalities of magic; often closely regarded as secret).

remains another strand to the equation: '[t]he player has the power to intervene … is compelled to do so … Technique and skill is *central to producing such affect* … Whilst we marvel at the spectacle we are also marvelling at the technique of the producer (or the production) of the effect as well as the apparatus which is able to deliver it' (2000:56).

Upon taking interactive games into consideration, then, we see the process of *interaction* becoming a literal process (of taking control of an object). Where the aspects differ, of course, lie in an exposition into *how* that interaction works (*how a story means, rather than what?*). It would seem that the construction of *spectacle* within narrative cinema finds a parallel with many 19th Century art forms: the circus, magicians, acrobatics, penny arcades and theme parks, all things purporting to the creation of 'spectacle'. 21st Century spectacle, it seems, is bound with movement into technological domains: IMAX cinema and theme-park rides, interactive games, digital films as 'spectacular' events; even the Millennium dome. In this sense, digital traverses the axis of spectacle and by doing so the link between games (*as* interactive forms of spectacle) moves closer to cinematic form: at a point when cinema *is* being poured into computers.

Throughout the next section, I will explore representations of space from the development of perspective through to 3D geometry. I will re-consider many of the questions I have raised in this section to discuss the extent to which our understanding is honed through appreciation of space: does the configuration of a space affect the way we choose to interact with, or understand, it?

II. Physical, Virtual and Game Spaces

3. Physical Space: Perspective, Navigation and Spatial Configuration

'Modern mastery of the physical world is exhibited nowhere more strongly than in our scientific understanding of physical space' (Wertheim, 1999:30)

Through an examination of the Arena Chapel in Padua, Margaret Wertheim examines the layers of narrative painted onto the frescos, which occupy every inch of wall-space within the building. Wertheim describes the chapel as embodying a narrative hypertext, where:

> 'one is engulfed from floor to ceiling in the world of Christ, his entire life story played out in startlingly naturalistic, three-dimensional, Technicolor splendor (…) [one where] the viewer is not compelled to start at the beginning: He or she may dip in anywhere and follow one part of the story for a while before branching off to another' (1999:81).

Wertheim sets the agenda for thinking about physical spaces as *embodying* narrative conventions. In this sense, she considers the interior of the Chapel as a container for – or a representation of – an unfolding narrative; cells within the overarching frescoed walls sequentially frame the narrative of 'the annunciation, that seminal encounter when God, through his herald the archangel Gabriel, makes Mary the mother of His son' (*Ibid*:74). The Arena Chapel is encoded from an external axis: it stands to signify a monument built for both reverence and religious practice. Now, the Chapel serves as an historical artefact: a documentary embodying both religious narrative and artistic technique. Meticulous preservation has kept both the frescoes and the structure in shape. So the Chapel embodies several parallel histories, rendering it as museum-space, its collection hugging every surface within the interior. The Arena Chapel stands in relation to its surrounding buildings as a referent: it serves social, historical and political functions, while the inside of the building embodies a virtual tour, which, like a curator's selection within art galleries, frames fragments of narrative (narratemes), all of which can be cognitively remapped into narrative order, depending on the viewer's selective navigation within the space.

Encased within the physical structure of the chapel were 'the first flickers of a new way of thinking (…) a radical departure from the flat style of earlier mediaeval art (…) [to one which strived] to simulate corporeal bodies occupying actual physical space' (1999:78). Underlying the shift towards 'solid-looking images', Wertheim suggests, was a 'newfound interest in nature and the physical world'. It is from the pioneering work by Giotto that Wertheim traces the earliest configurations of perspective: an ideology that would gradually erode the medieval vision of an ethereal spiritual realm, replacing it instead with increasingly more *concrete* systems based on calculations set in accordance with 'laws'; what came to be called perspective, Wertheim suggests, 'was driven as much by "scientific" as by aesthetic considerations' (*Ibid.*82). In *Perspective as Symbolic Form*, Erwin Panofsky (1927) suggested that:

> 'perspectival construction is a systematic abstraction from the structure of this psychophysiological space. For it is not only the effect of perspectival construction, but indeed its intended purpose, to realise in the representation of space precisely that homogeneity and boundlessness foreign to the direct experience of that space. In a sense, perspective transforms psychophysiological space into mathematical space'[1].

A key term here, is 'psychophysiological' space; Panofsky, like Wertheim, identifies perspective as more than a new means for visual representation or optical system, but as a result of a social and cultural shift in thought; towards a *structural*, or mechanised approach to representing – and hence thinking about – space. Panovsky initiates his argument by establishing a division between 'aggregate' and 'systematic' space. Aggregate spaces, he suggests, are non-homogenous and, as such, do not adhere to perspectival rules of representation; in other words: the sizes of objects in relation to one another are arbitrary. Systematic spaces are homogenous: mathematical expressions of visual space. The principle of 'systematic space' can be thought of as a means of mathematically mapping and transforming – if you like, a vector-mapping of – 'psychophysiological space' all visible space is absorbed into a quantum continuum, where: 'the material surface (…) is negated, and instead reinterpreted as a mere picture plane'[2]. Systematic space rationalises and orders *infinity* through the use of a vanishing point. Theoretically, the visual field would continue infinitely outside the 'planar'[3].

'Systematic space' opened out a new way of thinking about psychophysiological space: the mathematical framework – in some respects – shifted towards a *structural approach* to understanding the parameters and dynamics of space. Much of what I will be considering within this section regards considering how we can begin to think about – and ultimately interact with – spaces through our mappings of them, either *cognitively* or *systematically*. Sociologist David Harvey has suggested that, in essence, thinking follows structural or systematic principles; as we: 'learn our ways of thinking and conceptualising from active grappling with the spatialisations of the written word, the study and production of maps, graphs, diagrams, photographs, models, paintings, mathematical symbols, and the like' (Harvey, 1989:206). Frederic Jameson identifies a similar trend when he considers our notions of *cognitive mapping*; he suggests that such spatial practices have now become so commonplace, that they are to be considered as the social tools with which we map our own sense of place or space in any situation. Indeed, cognitive mapping process have led to: 'a pedagogical political culture which seeks to endow the individual subject with some new heightened sense of its place in the global system' (Jameson, 1991:54).

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[1] *Cited in:* <http://www.dgp.toronto.edu/people/stam/suomi/stam/panofsky.html>

[2] *N.B for ref (temp):* <http://www.newschool.edu/mediastudies/tv/channel3/page2.html>

[3] By planar, I mean the 'window' or *surface space* within which the vanishing point is positioned; once a vanishing point is set into place, objects can be drawn in infinitely, as long as they obey the laws of the perspectival vanishing point. In this sense, as both Wertheim and Panofsky have implied, perspective was a first step towards a 'virtualisation' or 'systematisation' of space: it maps a 'view' (as if through a window) and represents it within the parameters of a 'more or less correct geometrical construction.' *Cit.* <http://www.newschool.edu/mediastudies/tv/channel3/links/text1.html>

In this section, my intention is to begin by considering our *understanding* of physical space in relation to our means of *navigating*, or finding our way around the space. Just as Wertheim understands and analyses what she *sees* in the chapel through her narratological mapping of the space, I will argue that our relationship with physical *space* and our understanding of what *constitutes* that space, has evolved and changed as greatly as the changes in 'built space itself'. My analysis will begin with the evolution of perspective and then I will consider shifts in represented spaces within art and also, built spaces and architecture.

The Vanishing Point: Origins of Perspective

Wertheim traces changes in Western understanding of perspective; these she qualifies as shifting representation away from symbolic forms embodied within Gothic and Byzantine art, towards an impetus for the spread of a new realist style. Images were no longer to represent the unrepresentable spirits within the ethereal realm, but to concentrate on portrayal of what the eye could see. This marked a shift towards principles of linear perspective, where a point of origin set within the frame of the image, could be deployed to aid the structure of perspective and 'solid-looking imagery' (1999:90). Through application of geometry to image, bodies 'become sensible to our eyes' (*Ibid.* 91)

Bacon's doctrine on perspective, as Wertheim suggests, had political ramifications; it was primed in essence as a manifesto for the *virtual* creation of scenes which would appear so lifelike, that there could be no doubt in which the validity of what the spectators would see could *ever* remain in question: that '*realism*' of imagery would be the touchstone for a successful 'virtual reality'[4]. The mastery of painted scenes endorsing such geometrical accuracy, Bacon suggested, could carry enough to infuse 'spiritual images with enough literal verisimilitude' (*Cit. Ibid.* 90). In essence, then, Bacon's manifesto holds the key to the origin of virtual reality; *simulations* of biblical events could serve to 'bring the Christian stories to *life*' (*Ibid.* 91). The so-called geometric figuring formed the basis of an immersive experience, at a point where the principles of mathematics and physics converge into art to create a virtual story. Human imagination would now be invited, over the coming centuries, to pay reverence to images of anatomical perfection, where 'ideas or moments were (…) represented in an *illusionistic* space mediated by the conventions of one-point perspective' (*Cit.* Vargish and Mook, 1999:27)

The laws for the rendering of three-dimensional objects on a two-dimensional surface – to achieve 'optical similitude' – were incubated within the fifteenth century

[4] Indeed, 'virtual reality' is encoded with a double meaning. Most definitions of 'virtual reality' consider it as a system of *apparatus* which allow for an 'immersive' experience into a virtual world; this system usually comprises a computer capable of real-time animation and calculation, a set of wired gloves for interaction, a means for tracking the user's position and a head-mounted stereoscopic display for visual output (*See:* Krueger, 1991:xiii). However, in terms of human experience, we might want to think of this virtual reality in the context of *presence*: a sense of being immersed in an environment; it encapsulates the *perception*, or the cognitive mapping, of those surroundings: in this sense, images would be endowed with a *realism* which had never before existed. I will examine the phenomena of realism and immersion in relation to 3D space later in this section.

(a century and a half *after* the frescoes in the Arena Chapel). Painters such as Leon Battista Alberti, Masaccio and Leonardo Da Vinci, and the architect Brunelleschi refined and developed the perspectival system[5] which became known to some art historians as 'classical space'; a system which assumes a neutral, homogenous space in which all objects exist independently and are aligned within the image through the use of a single vanishing point. Vargish and Mook suggest that 'classical space' employs the same geometric principles as Newtonian space (1999:25) and was refined through the culmination of two realisations: firstly, that light travels in straight lines and, as such, could be represented 'in a manner identical to the light reflected by an actual three-dimensional subject' (*Ibid.*) and secondly, through the premise of Euclidian geometry, which formulated the rules for the geometric construction of a perspective rendering of a scene as if observed through a window. The artist 'draws lines representing light rays going from representative points on the subject through the hypothetical window pane (the picture plane) and to the pupil of the viewer's eye' (1999:25-6). Linear perspective was 'linear' for two reasons: because lines were drawn from a single vanishing point, all objects that were within the scene would be modelled using straight lines from the point of origin; light would also be traced using this principle. Secondly, as Vargish and Mook have observed, 'linear' implied the use of 'linear functions'. These would determine distances between dabs of paint on the canvas:

> '[S]uppose the subject to be rendered on canvas is a long rectangular supper prepared for thirteen diners. The front and rear edges of the table will be represented by two parallel lines on the canvas, and the ratio of the lengths of those two painted lines will be the same as the ratio of the distances between the canvas and the front and back edges of the actual table. A mathematician would say that there is a "linear" relationship between the distance of a portion of a subject from the canvas plane and the length of the painted line on the canvas representing that portion. In this context, the word "linear" means a direct proportionality' (Ibid. 26).

There is reason to believe that the realisation of linear perspective was not solely achieved without technological innovation. Da Vinci had described the principle of the camera obscura[6] and, according to James Monaco, the first published account of its invention dates back to 1558, the year in which Giovanni Battista published his book *Natural Magic* (Monaco, 1981:54). The camera obscura, itself embodying all the elements of a basic contemporary photographic camera, only without photosensitive film functioned in much the same way as a light-box does; light through a lens hits a plate, creating a projection onto a screen from which an image can be traced in such a way that the distance between any two points on a subject would be proportional to the distance of the points from the surface.

Other technologies, such as the camera lucida, allowed for perspective to be achieved through simulation of the illusion of looking through 'an open window'. The perspective painter constructs an image as if seen as originating from a particular point, the 'centre of projection'. On seeing a three-dimensional image on a two-

[5] *See* Wertheim (1999:105); Vargish and Mook (1999:25)
[6] *See:* Sussman, A. (1973) on Da Vinci's comments; <http://brightbytes.com/cosite/what.html> *and* <http://www.newcastle.edu.au/discipline/fine-art/theory/analysis/an-orig2.htm>

dimensional canvas, the viewer takes the place of the artist; a single point dictates to all the lines where they should fall or rest within the frame. All perspective images operate from the principal of a point of perspective origin: no matter where the centre of projection – the vanishing point – lies. In this sense, the vanishing point could exist within the frame, or outside.

By virtue of this point of origin, perspective *encodes the position of the viewer*. It places – or better, aligns - the viewer to the point from which they stand to view the image. Because perspectival images are all constructed from a single point of view – the vanishing point, the image can be said to direct the viewer to the central point; whether it is contained within the frame or outside. The *authority* of perspective is to some extent borne out of its own ability to fix the spectator within the image; there is an approximation because all the lines feed into the origin, encoding the spectator with a fixed referential point from which to trace the lines to the central point. Of course, linear perspective would always be false, the 'literal verisimilitude' Bacon spoke of within the creation of a *virtual* reality was little more than calculated illusionism – trompe-l'oeil. We have two eyes - and when we look, our brain receives two images and calculates depth through distance - so how can linear perspective purport to create something 'real' looking? Linear perspective offers 'at best, an approximation and a convention accepted by means of an *extensive tacit cultural consensus*' (Vargish and Mook, 1999:27; *my emphasis*).

What Vargish and Mook are suggesting here, by means of 'tacit cultural consensus', is that perspectival viewing depends not *solely* on the physiological function of the eyes, but on how the mind processes the information received. Don Ihde supports this view when he considers the phenomenon of macro-perception; his suggestion is that perpectival deformation was a process which took an 'unaware' viewing culture time to adjust to[7]. Understanding of perspective, in this sense, has cultural-hermeneutic dimensions: 'there is an informing of perception by culture which enables us to say that culture is perceived' (Ihde, 1995:76). Both Ihde and Monaco explain the process of perceiving – experiencing – three-dimensional perspective through the use of the Necker cube. The viewing position of the three-dimensional cube can be taken at three points: the first two involve perspectival 'training', where either the top of the parallelogram is privileged – and thus taken as the closest surface to the viewer – or the bottom is privileged and in the foreground. However, the third reading could be to take the parallelogram as a central point within the image and to see the lines as stretching out to the hexagonal frame. This would lead to the subject viewing a two-dimensional pattern.

Monaco uses a similar example to demonstrate Western understanding of three-dimensional space. When asked to construct a shape using nine sticks, subjects from

[7] A recent example of this: the early 1990s marked a phase where computer technology led to the automation of Single Image Random-Dot Stereograms (SIRDS), or *autostereograms*. These 'flat' images comprising of visual noise comparable to television 'static', found their basis in research into stereopsis: our ability to see 3D images. SIRDS effectively demonstrate how brains perceive distance between objects; we see the 3D objects embedded within the visual noise through deconverging our natural focus – gazing *beyond* a point. SIRDS eliminate depth cues by reconfiguring our 'natural' focus: literally training ourselves to look *through* a flat image to see the objects embedded inside.

African cultures laid all the sticks flat on the table, in essence capturing the 'shape', but neglecting to engage with the dimension of perspective as portrayed along the oblique 45° line; leading Monaco to conclude that 'images must be "read"' (1981:122). Ihde elaborates on this by using the idea of 'praxis' to explain a position of reading; he suggests that in any image there are multiple praxis leading into ways of 'seeing' (1995:86). Monaco suggests that the notion of seeing is binary in nature: 'the word "image" has two conjoined meanings: an image is an optical pattern; it is also a mental experience' (Monaco, 1981:123). What Monaco is shifting towards, here, is an exposition on *how* we are trained – culturally and socially – to *read* images. In any case: what we see is affected by how we *think* about and 'cognitively map' what we are seeing. When we play a game of pool, we are, I believe, thinking and calculating depth along three-dimensions (co-ordinates, angle, speed *etc.*). We *generally* tend to line-up and judge a shot using information from both eyes[8], which is the reason why players tend to favour centring their cue underneath the chin. In this sense, Monaco's division between an image (observing the shot) and the mental 'reading' (making judgements about how to *play*) implies that our understanding of the process of 'reading' is not only culturally and socially honed, but that visual skills are also acquired and adapted over time.

Cézanne: "The View Contains the Viewer"

'Expressing what *exists* is an endless task' (Merleau-Ponty, 1948:122)

The emergence of polymorphic seeing is considered by Ihde as an emergent characteristic of what he terms 'postmodern subjectivity': 'a proliferation of ways of "reading" now become metaphorical in the image technologies of the present. (…) Our perspectives are multiple, refracted and compound' (1995:87). Before I continue, I would briefly like to discuss the ramifications of the term 'postmodernism'. Few writers have attempted to reduce such an overarching – and possibly overused – term to an objective definition[9]. In any sense, the term is problematic unless it is anchored, or defined, in relation to a *preceeding* modernist period. Our understanding of a preceding modernism would form the political, cultural and social context within which 'postmodernism' could be read and understood.

In any case, Don Ihde's '*subjectivity*' concerns a literal observation: postmodernism regards both images and concepts as polyvalent structures; permitting a *fluid* reconfiguration of one's experience of the world, as the proliferation of ways of 'reading' continually shift the boundaries of meaning, as such a polyvalent approach to reading fundamentally destabilises specific meaning. In other words: postmodernism functions as a reaction *against* any idea of 'fixed' meaning within

[8] Although, as with 'reading' SIRDS, in binocular vision, most people have a *dominant eye* which works to correct the angle of judgement over the other, less accurate eye. The majority of sports require a high degree of optical convergence and the body naturally responds to the dominant eye for sighting and visual cues but both eyes are necessary for accurate depth perception and a wider field of view. This is why it would impossible to see SIRDS with only one eye, as depth is not discernable.
[9] There is, I think, a real fear that should such a definition exist, then it would ironically become the immediate target for a postmodern critique.

analysis. Whatever postmodernism could or could not rightly proclaim to be doing, it saw an end to grand overarching and universal theories.

In any case, I will discuss certain 'conditions' and criteria set out by the advent of postmodernism in more detail later in this section, although I want to begin by stepping back from it. Initially, my intention was to identify the French impressionist Paul Cézanne as instrumental in the orchestration of a shift in the way we think about perception and argue that he foresaw postmodernism. It seems to me that Cézanne's attitude towards his work and his outlook, single him out as a pioneer of what we would now understand as 'multiple perspectives', a way of seeing, or in Cézanne's case, thinking, that Idhe attributes to 'postmodern subjectivity'.

Yet Cézanne's work cannot easily be classed postmodern, however his work does seem to conveniently hedge itself into an earlier style known as formalesque. This was a style in which 'form was strongly privileged over meaning'. The creative phase of this style took place in the late nineteenth-century that is, broadly speaking, between 1890 and 1914[10]; as Cézanne's life spanned from 1839 to 1906, it would be easy to incorporate the corpus of his work into this period. In *Modernism's History*, Bernard Smith (1998) coins the term 'formalesque' to describe what he sees as a suppression of – or evolution away from – realist and naturalist art, which he sees as 'modernist'. I will examine this evolution in context shortly, but adopt Smith's observation of 'dialectical interactions in the visual arts of architecture, sculpture and painting' (1998:5). Formalesque, as a style, is identified by Smith as embodying 'the reduction of the concept of style to that of form' (*Ibid.*28). This notion, I think, is best considered in relation to the systematic process Cézanne adopted towards his work: arranging and manipulating the objects within his picture-space, creating an essence, rather than a verbatim capturing of a scene. David Sweet's criticism of Cézanne's work illustrates his approach effectively in his comparison of apples drawn by Chardin and Cézanne:

> 'Cezanne's [apples] are there not as subject matter but as devices which demonstrate that his painting system is "live" and operative. They are like the TV test card, designed to check the performance of the medium, but arbitrary in most respects. In the Cezanne the viewer must attend to the system and not the apples, to orientate viewing and to sensitise it to the characteristics of the system, not to orientate towards the meanings the system contains'[11].

My interests in Cézanne lie in his approach to thinking about what I will call picture-space; it's not that Cézanne ignored realist painting, but his 'system' – as Sweet's criticism has demonstrated – wanted to account for an uncertainty of perception, a process of interaction between the object and seeing it, allowing for variable viewpoints and possibilities of doubt. In other words: when looking at an object, if one's gaze changes slightly, the object may well look different. There is a suggestion that Cézanne's work has shifted representation away from linear perspective and art historians have suggested Cézanne has being instrumental in bringing an end to scientific perspective (*see:* Novotny, 1975:98), this he did, not by drawing in a

[10] *See:* <http://wwwistp.murdoch.edu.au/publications/e_public/amhope/smith.html>
[11] *Source:* <http://www.finearts.mmu.ac.uk/painting/davidsweet.htm>

perspectival system, but composing using placed instances of geometric solids within his work; to 'treat everything in nature by means of the sphere, the cylinder and the cone' (*Cit.* Verdi, 1990:51), a revelation which I will argue, moves art much closer to thinking about the 'object oriented' nature of interactive game design, which I will discuss later. There is a sense that what Cézanne was trying to do was create an engine, or a framework, within which he could systematise nature.

What could have provided Cézanne – among other artists – with the impetus to switch to what was considered as a new style of representation? One suggestion could lie in the invention of chemical photography. Although the concept of the camera obscura had existed for centuries, there was no way to 'fix' light onto photosensitive film until several developments occurred within the 1800s[12]. As Cézanne was born in 1839, the same year the invention of the Daguerrerotype was credited, so it would seem that he was born at a time where the function of the artist would begin to evolve from capturing 'reality' to a more conceptual way of looking at the world. If photography rendered the role of 'classical perspective' null and void, can this be the only reason for a revolution in rethinking the role of the artist? Zola suggests that the imprint of the artist's personality within their work is a necessity, that: 'there can be no man-made equivalent of a hypothetically "perfect" photograph, a depersonalised representation of nature' (*Cit.* Shiff, 1984:89). Photography's function is to capture light mechanically; the role of the photographer is to use the camera to expose the correct amount of light to the photosensitive film and to develop the negative into a positive image. The role of the artist, in essence is to represent what the photograph can't show'; Zola sees what we would now call 'photorealism' as a mechanical construct in art. Yet it is the curious use of term 'depersonalised' which, perhaps indicates that artists were encouraged to re-evaluate their own roles.

In *The Work of Art in the Age of Mechanical Reproduction*, Walter Benjamin traces the history of techniques used to reproduce multiple copies of images. His main focus however, is on the state of technology by 1900 to technically reproduce all 'transmitted' works of art. He considers in detail the repercussions both cinema and photography have had on art in its traditional form. His suggestion is that photography - and hence, cinema – threatened the development of both traditional and avant-garde art. Original works, he argued have an authority or an autonomy which derives from their aura as *unique* pieces. The presence of the original 'is the prerequisite to the concept of authenticity' (1936:222) and that when multiple reproductions substitute a plurality of copies for a unique existence, the reproduction permeates a shattering of tradition: 'the liquidation of the value of the cultural heritage' (*Ibid.* 223). The authenticity - or aura – of an original lies in the essence of its biography; all that is transmissible throughout its existence. In other words, its history: '[s]ince the historical testimony rests on the authenticity, the former, too, is jeopardised by reproduction when substantive duration ceases to matter. And what is

[12] Monaco (1981:54) suggests that Daguerre (1839) is 'usually credited with the first practical development' - the Daguerrerotype – as the first example of a working means of 'fixing the image of nature', but also credits Joseph Nièpce (1833) as providing much of the research to allow a breakthrough. He also cites Beaumont Newhall's observation that the first 'successful' photographic experiment occurred some years earlier, in 1827, when Henry Fox Talbot developed a system for negative recording and positive reproduction.

really jeopardised when the historical testimony is affected is the authority of the object' (*Ibid.*). Although Benjamin's prophecy hasn't strictly come true; masters of (reproduced) paintings *increase*, not *decrease* in value, there is a sense that the long-standing belief of art as a 'reproducer of reality' (the doctrine of realism) shifted with the advent of photography. Art had moved outside the sphere of realism and into a new territory, where it would be called upon to represent what the camera could not capture.

Cézanne had suggested that representation had to be called to account for an effect, which we may well now call 'interaction', between *seeing* and the *object* seen. In other words: the variation of viewpoints and possibilities of doubt in what one sees. The *lived* perspective, that which we actually perceive, is not a geometric or photographic one; the majority of humans see through two eyes, so to suggest that perspective offers an approximation, is to suggest that photography too, must follow suit; although the camera captures light onto film, it does so using only one lens. Merleau-Ponty suggests that in reality 'we see a form which oscillates around the ellipse without being an ellipse' (1948:121). With natural vision, he suggests, perspectival distortions occur; in nature there is no direct vanishing point from which to view the world, this leads to the principle of an emerging order through focus – when our eyes scan a large area, the images it receives are from multiple viewpoints and hence the surface is warped; we see: 'an object in the act of appearing, organising itself before our eyes' (*Ibid.*). How does Cézanne attempt to encapsulate this perspectival distortion? What he does in much of his work is bind multiple viewpoints – or perspectives – together. Although Cézanne claims to capture reality, it would seem that by doing so he denies himself the means to produce it, so: '[c]ups and saucers on a table seen from the side should be elliptical, but Cézanne paints the two ends of the ellipse swollen and expanded. The work table in his portrait of Gustave Geoffrey stretches, contray to the laws of perspective (…) [Cézanne freezes] these distortions in repainting them on the canvas. (…) This is why Cézanne's people are strange, as if viewed by a creature of another species' (*Ibid.*121-3). Perhaps this perspectival layering contributes to the reason Cézanne always claimed his pieces remained unfinished (*see:* Verdi, 1990:19). Photographs are not quite the same; they can never be incomplete: aperture, framing, timing and development can denote what makes a 'successful' image, but with a photograph light becomes fixed in a moment of the shutter opening and closing.

Cézanne wanted to take a 'new approach to reality' (Gray, 1967:47). Reality, for him was bound up with a search for form. The mind takes a role in the mental appreciation and understanding of form; as such, there is a necessity for 'logic' as well as 'vision' within this search. Cézanne made the bold assertion that 'a work of art is an organism in its own right, not an imitation of nature' (*Ibid:*:48). As such, Cézanne was at odds with many academic theories on art at the time, although despite this, he did not reject tradition: many of his studies have focused closely on past works[13]. What had changed was the focus on the 'centre'; the image character of his painting shifted from an *implied* stage space, a microcosm of subject and structure, to the constructive small units of composition, the pictorial micro-structure: hence

[13] *See:* Verdi (1990); Gray (1967:49)

Cézanne's advice to Bernard in 1904 to 'treat everything in nature by means of the sphere, the cylinder and the cone' (*Cit.* Verdi, 1990:51).

This was a prescription – a formal or structural doctrine – for reducing the imperfect forms of the living world to essential shapes. A similar motive is also echoed in Charles Blanc's *Grammaire des arts du design*, where 'horizontal lines give the feeling of the expanse of space' (*Cit.* Gray, 1967:49). However, Cézanne, it seems, was shifting away from linear perspective: initially, the idea of essential shapes and components within an image, coupled with the idea of the horizon line within an image, seem to transport us back into a three-dimensional *wireframe* framework[14]. Although three-dimensional geometry works in an isometric sense (that is: with angles of 60° and 30° from the vanishing point[s]), it is perhaps the idea of an aligning horizon line that orients the points and allows space (depth) to be created; this was the prescribed structure of renaissance space, perhaps more commonly understood as three-dimensional space. Cézanne's spatial configurations were slightly different.

The 1850 and onwards marked a shift in how the canvas was used in painting. No longer purely seen as a 'window' offering a perspectival view – as in Renaissance space – the canvas became its own world, with its own laws. Artists like Cézanne thought of the canvas-space not only in terms of strict perspective, but more as a flat surface. Rather than model and shade three dimensions into painted objects, thinking of light and shadows (*chiaroscuro*), he chose to paint in objects in fragments, not always blending all the objects together in perspectival harmony. Cézanne effectively combined the Renaissance notion of deep space with a notion of the flat surface, causing his paintings to have both flatness and three-dimensional space; so objects in one frame could have volume (shading) and – or – flatness. This combination causes a certain tension in his work, a way of depicting 'movement' within the scene; perhaps it is precisely this encapsulation of movement that denotes a sense of the unfinished work.

Judith Wechsler suggests that what is unique to the work of Cézanne is 'that it marks a shift in mid-twentieth century criticism from a predominately formal trend to a humanistic one' (1975:2). Through the manifold layers of academic criticism levelled at Cézanne, there is a clear sense that structures began to be broken down in acknowledgement of individuality / human [mis]conception. As such, criticism and interpretations served to answer to earlier interpretations of Cézanne's work, in addition to serving up critical analysis of the work itself. In this sense, his criticism has been built in a similar style to the layering techniques he used in his own work; that criticism has a similar trajectory, the theory (and analysis) advancing with the quantum leap painting seemed to be making. What Wechsler, among numerous other critics, does identify is the path Cézanne articulated for the Cubist movement. Gray reports that 'Cézanne (…) felt that the mind of the artist played an essential part in the process of making something real in the picture of the impressions of the senses' (1967:40). Perhaps the largest leap, however, and certainly the aspect that presupposed the development of Cubism, lay in Cezanne's own maxim that 'one must

[14] **Wireframe** is a term commonly used in 3D modelling: all 3D shapes (meshes) are constructed from a shell of lines and rendered with an outside 'skin' afterwards.

not reproduce nature but interpret it by means of *plastic*[15] *equivalents*' (Wechsler, 1975:5; *my emphasis*). I will evaluate this notion of 'plasticity' later in this section and in the next section, when I consider interactive content as adaptable – or *adaptive* – content. Before I do that, however, I want to discuss several other phases, which I consider as key moments in challenging the ways we think about space and spatial configuration.

The Science of Cubism

'The evolution of painting, and of cubism in particular, shared with science the common characteristic of drawing upon late nineteenth-century achievements, but in so doing, of intensifying and transforming them' – Edward Fry (*Cit.* Vargish and Mook, 1999:28)

'The Modern period has variously been identified as everything following the medieval period, or initiated by the Renaissance, or as enabled by the French Revolution, or as imposed by industrialism (…) Our Modernism is thus a period with clearly set historical limits, and one that has come to an end (…) It marks widely the acknowledged scientific, aesthetic and intellectual revolutions and it locates the threshold of that dramatic revision of values and modes of perception we are now experiencing' Vargish and Mook (1999:2)

Gray (1967:54) identifies two initial phases in the developmental register of Cubism. First, indications of a sharp distinction between the problems of form and those of space: '[o]bjects are approached with certain "pre-existent ideas" of form, but the object itself still plays a major role in the treatment of the picture'. There is logic, but also an object to which logic is applied: 'the object is analysed and interpreted, but it still retains its objective reality'. The second phase concerned itself with *synthesis*; an acute awareness began to build concerning the problem of reality and the reality of form: 'the core of the problem is found in the fact that *form belongs to the realm of ideas*[16], not to direct perception' (*Ibid; my emphasis*). Cubism, then, concerned itself with representation of form. It was an art, which, as Gray suggests 'placed great stress on ideas, the formulation of a consistent system of thought' (*Ibid.*).

Stress was impressed upon *change* and the dynamic nature of reality, two fundamental building blocks to secure the foundations of Cubist theory. Its statement: the role of the artist was – is – to create a new reality. Art would move away from the underlying, indeed restrictive, idea of 'systemised anatomy' and into a realm where it relies upon mathematics. As such, it dealt with intellectual concepts of things and not ephemeral sensations *per se*. Reality and hence 'realism', then become charged with dynamism: something which the artist could create using concepts. The role of the 'artist' became redefined: now seen as both *experimenter* and creator; now striving towards development of art along new lines and through new paths. As a style in its earlier stages, Cubism[17] suggested a transformation – an abstraction – of perspective, through an incorporation of multiple viewpoints into one picture-space; for Cubism,

[15] **Plastic: '**Pertaining to or (of an organism) exhibiting an adaptability to environmental changes' (Brown, 1993:2239).
[16] The notion that 'form belongs to the realm of ideas' will be something, which I will examine in relation to user *responses* to – or appropriation of – software forms in section three. In part of this section, I will examine the dynamic nature in which games are created to be played and also, expanded, edited, changed, patched and re-moulded into 'new' interactive forms.
[17] A stage often known as '*facet Cubism*'

subject matter is broken up, analysed, and reassembled in an abstracted form; a literal layering of multiple planes of perspective, which took Cezanne's treatment of nature as 'sphere, cylinder and cone' and created early forms of perspectival collage. As the style pervaded, 'represented' space changes its aspect, rejecting the previous and long held rules of the academy.

There are dimensions of touch and surface to the otherwise flat spaces of facet Cubism: as with Cezanne, the key representational concept underpinning the Cubist system is that the essence of objects can only be captured through showing multiple points of view simultaneously: the multiplicity of surface elevations from 3D surfaces all intersect into one picture-space. As Cubism developed, texture would become more central to it: later modes – which I will examine shortly – would incorporate both surface and texture, literally through a layering of thick and thin textures onto one canvas: areas of image would be accentuated through using thicker paints, whereas other layers would be deliberately thinned to sit *further back* on the canvas.

This notion of thinking seems to me to echo quite specifically what the majority of 3D games do: the code within – or the *engine* of – the game ceaselessly renders the game from a multitude of different angles at any given time, often allowing the player to freely switch between them, sometimes switching for them. I will of course, explore the multiple subjectivities within games later on, but to say that many 3D games also offer multiple perspectives on one screen; the classic *Elite* (Acornsoft, 1982), which I will discuss later, is one of many 3D games that combines subjectivities; just below the 'field of view' on the screen, or the *mise-en-screen*, the game incorporates a 'scanner' mapping the player's relative position to both the nearest planet and an orbiting landing station. The classic *Dark Forces* (LucasArts, 1994) similarly offers a wireframe schematic map of the game-world (or area), which can be overlaid over the mise-en-screen of the game. Here, we see the 3D perspective alone is in need of being complemented by complementary perspective modes.

Facet Cubism, at outset, created an omnipotent (or God-like) view of perspectival reality: striving to show every aspect of its subject, all simultaneously rendered onto one canvas. Such an anarchic approach sometimes caused criticism: speaking of the Cubists, Andre Salmon prompts the question: 'is not science the only guide for these seekers, impatient to have us submit ourselves to all the angles of a prism, *confusing touch and sight* which are the cause of such diversified pleasure?' (*Cit.* Grey,1967:57; *my emphasis*). Central to Salmon's question was a mode of thinking called Analytical Cubism.

Analytical Cubism

In place of earlier perspective systems that determined the precise location of discrete objects in illusory depth, Cubism offered an unstable structure of dismembered planes in *indeterminate* spatial positions: '[i]nstead of assuming that the work of art was an illusion of reality that lay beyond it, Cubism proposed that the work of art was itself a reality that represented the very process by which nature is transformed into art. (…) In the world of Cubism, no fact of vision remained absolute' (Rosenblum, 1976:13). Leger translated Braque's and Picasso's movement of the

mind into a movement of the body, their geometry and intellect *into the geometry of the machine* (*Ibid.*134): 'If analytic Cubism takes us to the mysterious core of a dialectic between art and reality, solid and void, line and plane, Leger's *stairway* takes us rather to the centre of a very corporeal universe whose shapes and movements are ultimately as intelligible as the inner workings of a machine' (*Ibid.*135). Cubism, then, seemed to be offering a sense of escape, of slippage from natural reality: a reflection of the interleaving of natural elements with machinery. The canvas becomes a virtual space containing fragmented subjectivities and elevations, human and mechanical interleaving and repetition of elements depicting the kind of iteration and recursion often found in fractal images[18]; whilst also alluding to an 'interconnection' – as with machines – where one part relates to the other, and all parts join to perform an action.

Nicholas Wadley described the long-term unsuitability of the term cubism, stating that 'the 1809-9 paintings are the only important Cubist works which one can only describe in terms of 'cubes'' (1970:13) and identifies some of the problems with Cubism, stating that 'there were no clear-cut separations between objects and little distinction between objects and spaces' (1970:54). Painting became a matter of colour, shading and illusion; a bricolage of elements arranged in a haphazard, cube-like sense; submission to all the angles of the prism through a collage of fragmentation. To the surface of these paintings, disruptive textures were deployed: 'the effect of adding sand, and so on to their paint was to increase the quality of the matter on the surface' (*Ibid.*63), separating as it did, texture from colour. Cubism, Kahnweiler suggested in the 1920s embodied 'the endeavour to capture the three-dimensional diversity of the outer world within the unity of painting' (*Cit. Ibid.*). Later stages of Cubism began to frame objects within the image: typography and collage were employed; deploying ready-made references to objects within the outside world into the space of the painting, whilst also causing a disruption to the unity of perfection that earlier artists had sought to achieve.

Cubism began to embody a notion of *bricolage*: a convergence of styles, textures and techniques into one picture-space. It also considered depth, angles and objects; motifs we see in Cubism resemble the myriad of styles that we see incorporated into 3D interactive games: fragmented and multilayered perspectives, graphical and textural styles layered over each other; many games echo motifs of the 'real world', motifs of cultures past and motifs of space travel and science fiction. These motifs, as I shall examine later, can often vary from corridor to corridor. If the essence of Cubism embodies experimentation, then similar forms of experimentation can be

[18] *See,* (for example)*:* Malevitch's (*The Knife Grinder,* Yale Univ. Art Gallery, 1912) <http://www.courses.psu.edu/arth/arth497c_pjm19/bigpics/km04.jpg>. Malevich's painting demonstrates a fragmentation of the planes of perspective, as offered by Cubism, along with a series of repeating shapes running off at different angles within the frame; an effect common to the movement of Futurism, where motifs are frequently repeated throughout the composition. Such chaotic repetition ultimately creates a uniformity across the piece, its looping motifs bear a close resemblance to the repetitions found in fractal imagery.

found in the evolution of game spaces like *Virus: The Game* (Sirtech, 1997)[19] and *Rez* (Sega, 2001)[20]; although I will deal with interactive forms of 3D games later.

Escher and Layered Perspective: Labyrinthine Space

This leads us to a discussion of spaces as navigable and labyrinthine structures. On a final note on perspective, however, I would like to draw upon the work of M.C. Escher. Perhaps what Escher is most famous for is creating systems for warping perspective to create complex mathematical illusions. His work can be said to have effectively mastered the creation of 'impossible' looking images, all of which employed rare geometric configurations. At a lecture in Amsterdam on 'the impossible', Escher claimed that: '[i]f you want to express something impossible, you must keep to certain rules' (Locher,1982:147).

Many of his works involve multiple intersecting points of perspectives, whereas some involve seeing images 'inside out'. Like Cezanne's work – and like much of the following Cubist studies – they employed a degree of plasticity. His work follows deliberate inconsistencies, through a culmination of shading techniques, stacked geometrics and mathematics: '[m]y objects (…) proceed as independent plastic creatures, and they may finally return to the plane and disappear into their plane of origin. This cycle then forms a complete subject' (*Ibid.*168). Repetition and multiplication are employed to create seamless and physically 'impossible' looking images.

Escher felt the restrictions of linear perspective allowed for the creation of images which were 'too ordinary, too boring, too common' (*Ibid.*147). In one image in particular, his *House of Stairs* (1951), he used three vanishing points, all interconnect through networks of curved lines stretching from the zenith to the nadir for each point; all vanishing points interconnect through these curves. The result is a seamless labyrinthine image that maintains spatial integrity from the top of the image to the bottom; as such, the image can be tiled in a long vertical strip. The image *appears* labryrinthine as it creates the impression of continuing and curving through every point of exit; all passages create the illusion of linking to other spaces within the house. The pattern (*rep. Ibid.*145) repeats through three points of origin, from the one vanishing point to the next, zenith and nadir intersect, the result: potential for a seemingly infinite number of intersections. His work is often thought of in terms of navigation; it is labyrinthine because it functions on a level that confuses its spectators. In this sense, much of his work has the effect of 'drawing' the viewer in

[19] Once installed, the mise-en-screen of *Virus: The Game* models itself on the directory structure of the user's hard drive. Coloured doors correspond to navigation methods for folders or files (up a level, down a level, forward, backwards), so the directory structure (and sub-directories) becomes a tangible space mapped for use within the game-space. Text files and images stored in the user's folders become rendered into the game-space.

[20] In *Rez*, as the player moves through the game, their actions *re-code* the soundtrack; essentially a stock of linkable motifs, these are layered together differently in response to a user's actions, so an act of crashing, picking up an object, or shooting an object within the *mise-en-screen* trigger a unique chain of musical events, each time creating a new and different soundtrack for the game.

and making escape difficult, as they too often move from point to point within the visual looping structures he creates.

Architecture and Space: Jameson's Bonaventure Hotel

> Relativity is a theory of the measurement of space and time; Cubism revolutionised the treatment of space in visual representation; modernist fiction explores the possibilities of a new temporality in narrative (Vargish and Mook, 1999:6)

My intention now is to briefly consider some of the cultural and social codes of physical navigation; for this, my intention is to use two analyses of postmodern architecture – and postmodernism in general – and set-out the parameters for a discussion I will also evoke within later sections. In *The Language of Post-Modern Architecture*, Charles Jencks draws upon yet another visual illusion: the 'duck-rabbit figure'. Depending on whether the image is scanned from left-to-right or the reverse, either a duck or a rabbit can be seen. He suggests that we have 'well learned visual codes for *both* animals, and even probably now a code for the hybrid monster with two heads, we can see it three ways' (1991:40). Jencks argues that we can think of architecture in the same way, suggesting that the codes applied to it are 'radically schizophrenic'[21]. Yet architecture *is* public and as such, has visual codes mapped to it which differ across both cultural and subcultural boundaries[22]. In this sense, all architecture has a narrative element imposed upon it. People *talk* about buildings in a language with short-lived codes; a building that has stood for several hundred years and the way people regard it can differ from decade to decade. What Jencks is moving towards here, is the notion of eclectism, which much like Cubism, constitutes a 'hybridisation' of form through the juxtaposition of contrary elements: 'there is nothing to keep an age from inverting the semantic space of its predecessors' (*Ibid:*60).

In *Postmodernism: or the Cultural Logic of Late Capitalism*, Frederic Jameson has suggested that we are 'here in the presence of something like a mutation in built space itself' (1991: 38). Furthermore, he suggests – contentiously – that human beings have not kept apace of such changes; that the mutation of the object has not been met with an equivalent mutation in the subject. In other words: 'we do not yet possess the perceptual equipment to match this new hyperspace (…) because our perceptual habits were formed in (…) the space (…) of high modernism' (*Ibid:*38-9). Jameson goes further to think of newer architecture as standing for 'something like an

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[21] For Jameson, postmodern culture is located within an analysis of the development of capitalism; postmodernism is a new phase of this evolution. For him, postmodern culture hybridises high culture and mass culture in a way which creates a 'depthlessness' which resists interpretation. Pastiche is a central element, which reduces a concept of history 'into visual mirages, stereotypes or texts' (1991:26); this, he argues ruptures narrative and subjects in a "schizophrenic" dispersal of fragments. Similarly, Lyotard suggests the idea of a bricolage of quotations from previous styles or periods: a 'rubble of distinct and unrelated signifiers' (*Cit. Ibid.*)

[22] Michael Dear has suggested that '[a]ll architecture (…) politicises space' (2000:180). For an example of this, we could consider architect Daniel Liebskind's controversial plans for the 'spiral' extention to London's Victoria and Albert Museum. The debate seems ongoing, although one of the primary concerns lies in whether the anarchic structure of the twisted building will become a 'blot' in comparison to the sober and regimented architecture of the rest of the surrounding buildings.

imperative to grow new organisms, to expand our sensorium and our body to some new, yet unimaginable, perhaps ultimately impossible, dimensions' (*Ibid.*). Both Jameson and Jencks are moving towards a consideration of spatial configuration through their analyses. Jencks identifies modern architecture – and in these terms, 'postmodern' architecture – as taking space as its main subject (1991:96). Some of the developments he mentions draw upon ideas of 'layering' and motifs that involve the skewing and distortion of space, where 'sharp angles (…) exaggerate perspective' (*Ibid.*). He chooses the interior and exterior of the Westin Bonaventure hotel as spaces which he believes, precisely epitomise this 'mutation'.

Jameson's evocation of a 'postmodern logic' can be seen as a blanket term, pervading or traversing the spheres of politics, history and culture at once and simultaneously. One of the key problems with his approach is that he lays himself open to criticism[23], although he has attempted to suture all areas of culture together; arguing that the divide between modernism (*or* high modernism) and postmodernism lies in the conceptualisation of a society too dispersed and varied to be able to perceive any form along a single axis.

A 'modernist' or classical narrative form could create an encapsulated sense of a society, or history[24] in a tidy, symmetrical way: armed with its own logic (much like Propp's fairy tales, or the renaissance system for perspective), a modernist narrative text could be seen as having a sense of closure and self-containment and thus have a style or 'label' prescribed to it. In such structures, an overarching form or framework encapsulates an impression of the 'reality' it attempts to capture. Art in the realm of the postmodern, Jameson argues, functions in the opposite direction: reality *always* remains larger than any prescriptive form that will represent it. As such, a 'new' art-form emerges built upon quotation, self-reference, repetition and a multitude of intermeshing languages and forms.

This, he goes on to demonstrate, creates a confusion in human relation to built space. At the centre of his argument he places the Westin Bonaventure hotel, itself aspiring to create a total space, 'a complete world, a kind of miniature city' (*Ibid:* 40). Inside the building, he sees the space working in a way that replaces the 'narrative stroll' with a 'transportation machine' that transcends the capacities of the individual human body to cognitively 'map its position in a mappable external world' (*Ibid:* 44):

> 'We know in any case that recent architectural theory has begun to borrow from narrative analysis in other fields and to attempt to see our physical trajectories through such buildings as virtual narratives or stories, as dynamic paths and narrative paradigms which we as visitors are asked to fulfil and to complete with our own bodies and movements. In the Bonaventure, however, we find a dialectical heightening of this process: it seems to me that the escalators and

[23] *See:* Hutcheon (1988). One of the issues at stake here, is that Jameson's system is in a sense, a grand schema; while this makes it accessible, it is also frequently criticised for being 'too totalising'.
[24] For a specific historical axis, we can consider for example, a Shakespeare play, or Chaucerian narrative. These can also be thought of as the creation of a personal style. Jameson argues that postmodernism takes in the form of pastiche as a defining principle, in opposition to the [High] Modernist parody. As a result, art becomes artifice, an endless recycling of past moments, as: 'Modernist styles thereby become postmodernist codes' (Jameson 1991:17).

> elevators here henceforth replace movement but also, and above all, designate themselves as new reflexive signs and emblems of movement proper' (*Ibid:* 42).

It seems a confusing space: such confusion is understood to re-enact, at the level of architecture, the geopolitical confusion of life immersed in advanced (late) capitalism[25]. In fact, the logic of the Bonaventure seems to chime in closely with the configuration of the casinos in the space of downtown Las Vegas (*see:* Broadbent, 1990:245-252), a point which he may be alluding to when he mentions the emblematic 'learned from Las Vegas' (*Ibid:* 39). Such a technique is also used in large department stores, shopping malls[26], the millennium dome and supermarkets: the guiding principle of disorientation: the creation of an impulse to buy (perhaps through disoriented frustration). Perhaps it is this mechanism – working at a more metaphorical level – which underpins his 'cultural logic' of late capitalism.

Jameson's analysis of the Bonaventure Hotel stands as an overarching example for his own reading of a culture immersed in the practices of late capitalism; this leads him to suggest that a notion of disorientation ensues as a result of this logic. Anne Friedberg suggests something similar: 'Jameson maintains that the twin symptoms of modernity – anxiety and alienation – have given way to a new cultural pathology of fragmentation' (1993:171). Two clinical terms have been raised throughout this debate, Friedberg's 'pathology'; and Jameson and Lyotard's notion of a postmodern 'schizophrenia'. Both terms call into question a lack of order, or a *stability* in what is seen and understood. Walter Benjamin has suggested that architecture 'has always represented the prototype of a work of art the reception of which is consummated by a collectivity in a state of distraction. The laws of its perception are the most instructive' (1973:241). So what does Benjamin mean by 'state of distraction'? Indeed, is this the same as Jameson's disorientation? In a sense, the challenge is a two-fold one: Benjamin has stated that buildings are appropriated in a two-fold manner – through both use and perception – or 'by touch and sight' (1973:242). The change in built-space, then, concerns the creation of spaces that by doing so, change behavioural patterns within people. In other words, the disorientation leads from an experience of being offered a space which, on the surface, is different to that which preceded it. This in turn affects the way we interface with the space, or appropriate it. The objective underpinning my discussion here is on the way in which we reconfigure, or re-train ourselves, to deal with different forms of space; this is a notion I will shortly begin to examine in relation to spaces found within interactive games and virtual spaces also. With games, a key term I would like to introduce is 'interface': a means by which we navigate a game space. It seems to me that a premium is placed upon the process of learning how to 'play' an interactive game as we acquaint ourselves with the interface which allows us to master such games. This premium – as Jameson has indicated – is no different within the realm of new built

[25] A comparison has been famously drawn with London's Barbican Centre, a 'modernist' building with a labyrinthine interior and exterior, which create a similar sense of non-navigability. His description also reminds me of problems I have experienced whilst trying to get from one point to another in the Canary Wharf area of London's Docklands. The frustration was borne out of the fact that I could *see where* I needed to be, although this was difficult to achieve due to a labyrinth of roads and buildings.
[26] The Mall of America (Minnesota, USA) distorts the notion of time precisely by disallowing representation of 'real light' within and complementing this with a lack of visible clocks.

spaces: 'the tasks which face the human apparatus of perception at the turning points of history cannot be solved by optical means, that is, by contemplation, alone. *They are mastered gradually by habit*, under the guidance of tactile appropriation' (1991:242; *my emphasis*). Tactile appropriation: familiarity and understanding gained through physical contact and exposure to a space.

The City as Labyrinthine Space

'Cities, like dreams, are made of desires and fears' – *Italo Calvino*

Before I move on to considering the development of 'virtual spaces', I would like to briefly consider the configuration of the 'city' as a navigable space. I will be brief here, as my intention is to cover this notion again in section III when I begin to theorise how we can think about user appropriation and use of game spaces.

David Harvey, citing Raban, argued that the city was like a theatre; a series of stages upon which individuals could work their own distinctive magic whilst performing a multiplicity of roles. The idea of the city as labyrinth: 'honeycombed with such diverse networks of social interaction' (1989:5) as too complicated to ever be disciplined, as a place where people were 'relatively' free to act as, and become what they pleased. As such: '[p]ersonal identity had been rendered soft, fluid, endlessly open' to the exercise of the will and imagination' (*Ibid.*). This leads Harvey to the idea of a city which 'invites you to remake it, to consolidate it into a shape you can live in. (...) Decide who you are, *and the city will again assume a fixed form around you*'[27] (*Ibid.; my emphasis*). Cities are plastic by nature; we mould them in our images, they, in turn, shape us by the resistance they offer when we try to impose our own personal form on them. Such plasticity, fuels the 'continual creative play of urban living'. James Donald also recognises this notion of plasticity and adaptability, arguing that cities are not spaces with fixed meanings:

> 'ways of seeing and understanding the city inevitably inform ways of acting on the space of the city, with consequences which in turn produce a modified city which is again seen, understood and acted on (...) an economy of symbolic constructs which have material consequences that are manifested in an enduring reality' (1999:27).

For the most part, it seems that there is a suggestion that such moulding, or resistance, only takes place within the space of the city – perhaps through some form of *urban* determinism? In section III, I will argue that this notion of 'plasticity' can be highly effective in setting out an understanding of how people use spaces in interactive games, suggesting that the parallel transfers perhaps more effectively when applied to computer 'coded' and user 'adapted' 3D game spaces. The next chapter will develop an understanding of virtual spaces, in an attempt to isolate the criteria characterising such a form of space and how it can be thought about or conceptualised.

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[27] *Cf:* Charles Jencks: 'I like to think of the city as an uncanny organism, a slime mould that becomes a free-market individualist in good times and then, in bad, partly dies back and suddenly coagulates together'. <http://www.findarticles.com/cf_0/m0FQP/n4290_v125/18524261/print.jhtml>

4. Spaces II: Virtual Spaces – Cinema, CAD, VR and Internet Spaces

'Everything in nature is modelled on the sphere, the cone and the cylinder. One must learn to paint from these forms; it will then be possible to do whatever one wishes' – Paul Cézanne

The Origins of Virtual Space

This chapter will begin by setting out a framework for a logical analysis of 'virtual space'. As I do this, I will try to 'bridge' connections between the physical spaces I mentioned in the previous chapter, and the spaces I will mention in this chapter. In a sense, we could argue that many of the spaces discussed last chapter embody virtualising principles; how can perspective create anything other than a virtual system of reference? Perspective is after all, a logical system for representing something on a 2D surface and by doing so, creating an *illusion* of depth through the scaling of objects in relation to other objects; surely such representations of depth account for a virtualising principle? The illusions created by Escher must surely take place in a virtual realm, as they strive to create the impossible within the physical parameters of a drawing?

We need to build a distinction between the represented spaces of 'art' in the physical realm and what we consider to be 'virtual' spaces on the other hand. First, I'll consider several questions: What *are* virtual spaces? Or rather, what *constitutes* such spaces? What characteristics begin to define such spaces as 'virtual'? Finally: why has it become important for us to draw distinctions between physical and virtual spaces? Indeed, *can* we draw adequate distinctions between the two?

All of the following are broad questions and, as such, *do* need to be addressed in a way that cogently articulates a separation between the 'physical' and the 'virtual'. In the previous chapter, I examined a sequence of configurations which I have suggested, take place in a physical space. These spaces are tangible; they can indeed be touched. As such, they are appropriated by sight, touch and texture. As I mentioned painting in the previous chapter, itself constituting a 'virtual space' and often abstracted from the realm of the real, it does nonetheless exist as a tangible artefact: paintings *must* exist within physical space and are created through the use of layers of physical material[28]. If a distinction can therefore be forged between physical and virtual space, then we need to be clear as to how we articulate the divide. As Nigel Thrift as observed, within contemporary culture, a 'virtual' connection – and indeed, the term 'virtual' has become synonymous with social experiences which are enabled through the mediations of information technology[29] (*See:* Thrift 1996:1464).

Yet it seems to me that virtual space – by its very nature – must exist within the confines of physical space. If not, such spaces would be completely intangible from a point of accessibility; how else could these spaces be located if they were not *mediated* through the physical spaces we inhabit? One answer is obvious: by

[28] And by making this distinction, we can also consider photography as part of this arena.
[29] Computer theorists also use the term '*cyberspace*' in reference to the notional social arena we 'enter' when using computers to communicate (*See:* Hakken, 1999:1).

becoming 'virtual' ourselves. This is an argument put forward by popular science fiction; but for the purposes of the discussion within this chapter, I will examine notions of virtual space through a discussion of the *apparatuses* involved in allowing virtual space to be created. I am working with an assumption that all exchanges which take place within virtual spaces, do so through carriage by hardware – and often, software – apparatuses which act as intermediaries between the sender and the receiver. Virtual spaces are therefore places where users interact with 'texts', or use systems with – or without – other users, whilst only remaining in physical proximity to the apparatus that enables the appropriation of the space, such as a PC[30].

I will work from the premise that virtual spaces *are* accessed from nodal points – or gateways – within physical space and as such, all share one common characteristic: exchanges are all conducted through mechanical – or electronic – technologies; Margaret Wertheim has suggested that we 'are witnessing here the birth of a new domain, a new space that simply did not exist before' (1999:221). From the projection of light onto a screen within a darkened auditorium, to the vast stores of digital information that constitute layers of data when we navigate our way around a database, use the Internet for reference, or use a Computer Aided Design (CAD) application, an action is taking place within a virtual space. Virtual space: 'is what happens when you leave the landscape and move onto the map'[31]; the process of appropriating virtual space concerns the notion of a *transaction* made between a human and a mechanical (or electronic) device.

In this sense, I am arguing that my distinction can be drawn by comparing viewing a page on the internet within a 'virtual space' on the one hand; and looking at a fixed print-out of a web page on the other[32]. Essentially both hold the same content, but one requires mechanical mediation – the mediation of a computer system (in the 'online', or 'live' sense of the word), whereas the other is fixed onto paper using patterns of inks or toner to create an image. However, the transaction process of printing – and the transaction of storage and movement of information – takes place in physical spaces: chips and registers temporarily hold information and shift it through connecting cables from one device to another: the computer sends the digital page information to an interpreter for printing, which creates postscript information and feeds it to a printer in a language the printer can understand, in order to enable a matrix of dots to be placed on a page to construct an image. Virtual space, then, concerns a process of transaction where we are dependent upon a device – or series of devices – to create a condition within which we can engage in an experience.

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[30] It is often common for PC applications, such as authoring tools, to be called 'studios' as they provide the user with an organised 'virtual' studio space and tools within which to work. For example, Macromedia's *Director* and *Flash* products both extend this analogy by calling the work area a 'stage'; Adobe's *Illustrator* calls the work-area an 'art-board' – both of analogies compare their devices to physical equivalents.

[31] *Cited:* <http://www.spaceless.com/papers/1.htm>

[32] This process could otherwise be seen as articulating a *physical* division between online and offline viewing; only here the process of reading takes place either 'on screen' (on line) or reading from a device independent hardcopy.

We could possibly trace virtual space back to the 'nowhere somewhere' – as William Gibson describes it – that we enter when we partake in a telephone conversation: the telephone enables the seemingly instantaneous suturing of two remote spaces via a network of cables, satellites and routers, creating a feeling of (or: *an*) instantaneous conversational relay where two disparate spaces become temporally aligned within a third, *virtual* space. We could also trace virtual spaces back to technologies of transmission and reception of radio waves; or the television, which 'has developed a mode of presentation that envelops the viewer and presenter in a virtual space of an imaginary conversation. This "fiction of discourse" or of presence is furthered by the habitual and distracted way in which we receive television' (Morse, 1998:163).

If we are to embrace Margaret Morse's idea of a 'fiction of presence', then we can understand virtual spaces as ones which operate in their creation of *arenas* within a physical environment where communication is enabled through an elimination, or erosion, of a conceptual understanding of physical *distance*. My first point of analysis, then, will cover early cinema theory. Cinema, it seems, opened up many commentaries on the notion of 'travel'; where spectators could be transferred by film and apparatus into a third space[33], where spectacle was presented as an ordering of light onto a screen, which itself had been edited into narrative order.

Cinema and Virtual space: Film Architecture and Montage

> 'Our taverns and our metropolitan streets, our offices and furnished rooms, our railroad stations and our factories have appeared to have us locked up hopelessly. Then came the film and burst this prison-world asunder by the dynamite of the tenth of a second, so that now, in the midst of its far-flung ruins and debris, we calmly and adventurously go travelling' (Benjamin, 1973:238)

Walter Benjamin linked cinematic effects of montage and spatial configuration to the psychological experience of life in the city. The shock of traffic, the intensity of large crowds, fragmentation of space through planning[34], led to a fascination with the 'mobility of the visible' – as Lev Manovitch describes it[35] – or what Anne Friedberg (1994) has called the 'mobilised virtual gaze'. Benjamin hints towards a dynamic potential for a 'remapping' – through imagined journeys – of the built space audiences inhabited. This 'mobilising' of the gaze which through new technologies, enabled its audiences to 'calmly and adventurously' go travelling, led to an immobilising in another other sense; the 'virtual space' created by cinema, effectively created a prison – a darkened auditorium – for spectators, who would become disembodied as they watched a spectacle of interactions take place on the screen from their seats. Guy Debord (1967) has suggested that: '[t]he entire existence of societies where modern production relations prevail presents itself as one huge accretion of spectacles. Everything directly experienced has been consigned to a depiction'[36]. Everywhere,

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[33] I am defining 'third space' in relation to the spectator's position within the apparatus and the space created by both apparatus and spectator.

[34] Ben Singer has listed the above as *determining factors* of the first two decades of film culture (*See:* Singer, 1995); *also* <http://www.nottingham.ac.uk/film/journal/articles/parallax-historiography.htm>.

[35] *See:* <http://www-apparitions.ucsd.edu/~manovich/text/digital_nature.html>

[36] *Also translated as:* '[i]n societies where modern conditions of production prevail, all of life presents itself as an immense accumulation of *spectacles.* Everything that was directly lived has moved away into a representation' *See:* <http://library.nothingness.org/articles/SI/en/display/16>

reality is consistently being replaced by images. These images, in time, become reality. Cinema became a perfect virtualising force for the spectacle of images replacing reality; indeed, Giuliana Bruno has described cinema as a 'mobile map' (1997:10); I wish to discuss the notion of realising cinematic virtualisation in relation to other theatrical forms which came before it. The next question, then, is how we can distinguish between theatrical (stage) space on the one hand; and cinematic (screen) space on the other.

Walter Benjamin offers a comparative analysis of stage space and cinema space, suggesting that the process of *virtualisation* takes place between the two steps. The artistic performance of a stage actor, as he suggests, is presented to the public 'in person': the performance – in a linear sense – is presented to its audience as 'an integral whole' (1973:230). This is not so with film. Montage, optical tricks, camera lowering and lifting and rear projection all create a sense that if any process of identification is taking place, then it 'is really an identification with the camera' (*Ibid.*). At the heart of Benjamin's argument is a distinction between 'live' and 'contrived' production; he suggests that the difference between a production for a theatre audience – experiencing events in a live space – and the 'mechanical contrivance' from the projection of a pre-recorded and edited performance, lies in a split between 'live' and 'virtualised': the mechanical replay of an already edited and 'fixed' composition will remain unchanged over several viewings, whereas live theatre space allows for a performance which fluctuates due to a margin of 'human error' at any given time[37].

This contrivance affects actors too: the film actor, then, is exiled from the stage, as s/he plays for the camera, housed within a studio as opposed to the lit set of the theatre. It is this contrivance – and the subsequent possibilities the mechanical mediation of narrative allow for – that mark the possibility of *virtualisation*. The space of the film studio – much like the theatre – is a space for performance; but the primary recipients of this performance are the mechanical devices capturing it.

This duly affects the meaning of the term 'performance'; the key to the production of film lies in the non-linear way in which it can be arranged. A theatre performance moves from the first to the final scene, irrespective of the way in which the story is told. Of course, the same is true for film: a film has a beginning and an end also. Yet it is produced in a fragmented way by virtue of the technologies used to capture, assemble and project the final – 'stored' – performance. In a sense, the theatre space is as much of a 'virtual' space as the film studio – both are spaces within which a performance is contrived. The process of virtualisation, then, has to do with the degree of mechanical mediation which involves all stages of film production: from initial preparatory planning to finalising post-production. This also provokes a further question: does such mediation actually move us to a *new* space? In order to consider this, I will examine some of the earlier theories on cinematic space – starting with Sergei Eisenstein.

[37] Human error *can* occur within film, although it is fixed into the production at 'edit time' and will become part of the performance whenever it is projected.

Eisenstein's Film Form

In 1934 Eisenstein reflects upon the 'new' virtualised space of 1920s cinema: '[w]e came upon no ready-built city; there were no squares, no streets laid out; not even little crooked lanes and blind alleys, such as we may find in the cinematropolis of our [present] day. We came like bedouins or gold seekers to a place with *unimaginably great possibilities*, only a small section of which has even now been developed' (1954:3 *my emphasis*). By today's standards, Eisenstein was right: cinema *has* changed since the time in which he crafted his films, although much film theory functions on the basis of many of his arguments for structuring – or architecting – film[38]. Fundamentally, however, our understanding of structuring film (the *architecture* of film), owes much to the corpus of Eisenstein's work. The 'cut and paste film editing techniques' that John Freeman identifies[39] with Eisenstein, seem to still remain central to any understanding of film construction[40]. For the purpose of this analysis, however, we *are* still looking for a way to uncover what it means to class film as a 'virtual system'; and before I discuss Eisenstein's techniques, I believe that Gilles Deleuze's synthesis of cinematic space is worth mentioning to further clarify this[41]. Deleuze (1983:2) has argued that cinema creates virtual space through the precise interleaving of what he classes as 'immobile sections' (sequences of stills), which are projected at twenty-four frames per second alongside a foley, or soundtrack. He suggests that 'cinema does not give us an image to which movement is added, it immediately gives us a movement-image' (*Ibid.*). He refers to the term 'illusion' when he describes cinema and suggests its role as to 'take snapshots (…) of the passing reality' (*Ibid.*) and re-structure the captured reality into narrative sequences. The term *mise-en-scene* is specific where space is concerned: it literally refers to the arrangement of space within the shot or the frame.

We can, I hope, already begin to see that cinema is a spatial art, and, as such, opens up ways of thinking about how scenes formed from 'immobile sections' can be said to contribute to the creation of a 'virtual space'. What I would like to concentrate on now, are the fundamental elements of film-making. In his discussion of film form, Eisenstein mentions a two-fold process of fragmentation and development – later still, he talks about how other art forms work in this way, but what is key here, I think, is his remark about film specifics which 'lie not in the process itself but in the degree to which these features are intensified' (*Ibid.*4). For Eisenstein, the key to his process of intensification lies in the way films are produced and structured. He evokes the terms

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[38] Eisenstein was initially trained as an architect, which, for me, is one of the reasons why he is so useful for the study of the structural composition of film. Many film theorists, most notably, David Bordwell, have engaged in film analysis through critiquing Eisenstein's work (*See:* Bordwell, 1993)

[39] *See:* <http://www.uml.edu/Dept/Art/Freeman/imaging_place/imaging_place.html>

[40] In the event of 'digital editing', Eisenstein's theory of a 'montage of attractions' is still relevant; digital apparatuses now allow faster editing and more refined cutting and visual mixing, but our notion of a creation of illusionist 'spectacle' through the advent of computer graphics (*See:* Ndalainis, 2000 *and* Darley, 2001) still follow Eisenstein's initial idea of creating a montage from the meshing disparate elements into a cogent narrative order.

[41] And Deleuze's arguments have been adapted to cover computer-mediated virtual spaces; *see:* <http://www.mars-patent.org/projects/marina/marina.pdf>; I discuss elements of this piece in the next chapter.

'frame'[42] and 'montage' to clarify his point; I consider his notion of framing to be concerned with locating the camera within the *mise-en-scene* and all the elements the term encompasses[43], whereas the process of virtualisation grows from the concept of montage – literally the sequence in which the frames are *assembled*. Because film concerns itself with composition, a story montage is assembled block by block; encoded with layers of sound to create an illusory sense of reality. Monaco (2000:216) backs this concept up: for him the term 'suggests a building action, working up from raw material'[44]. In essence, montage is simple enough to understand – although Monaco describes three ways in which montage is used: primarily to create 'basic meaning' through a suturing of adjacent shots – in essence, the process of editing[45]. More specifically, he suggests that montage is a dialectical process that creates a third meaning out of the original two meanings of the adjacent shots; and a process in which a number of short shots are woven together to communicate much information in a short time. Finally, he suggests that in any montage sequence, a dialectical process is taking place, conscious or not (*Ibid.*).

But montage can also be created from a selected sequence of stills with added narrative. In *La Jette* (Marker, 1962)[46], for example, montage is created through what could essentially be created using a projector and slides; the story is told while still images are displayed one after another. This process, then, functions more like the early pre-productive process of building a story from a story-board - where still images are drawn and the action (or story) is explained in a 'cell-by-cell' account. For Eisenstein, film montage opened up new spaces; through this weaving and suturing of disparate shots, film creates a *fictional* space. It is *virtualised* by the fact that it is created, assembled and projected through mechanical means: film depends upon its apparatuses and without them it could not be film. With film, then Eisenstein states 'this process [of virtualisation] is raised to such a degree that it seems to acquire a new quality (…) [it can therefore be seen as] a *creative remoulding of nature*' (1977:5; *Italics added*). With cinema came something new: Benjamin suggested – as I have previously argued – that in the early nineteenth century, the focus of art began to change and began to abstract itself from the realm of so-called 'real' representations, at the same time photography began to develop as an art-form. The evolution of cinema was what added the virtual dimension; a photograph can be developed and - through this process – begins to exist in a tangible space. Film is

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[42] Deleuze usefully suggests that 'if the frame has an analogue, it is to be found in an information system rather than a linguistic one' (1983:13). This approach, I think, moves us towards an understanding of a virtual system: an analogy comparable to thinking of frames as 'data' items.

[43] Such elements include lighting (what is lit and what is not), set design, camera position in relation to subject, depth of field, everything *within the scene*. Unsurprisingly, it finds its origins in theatre design, where we would consider what is on the stage and what will need to be illuminated.

[44] In terms of 'montage', there has been little agreement on the technicalities of the term – as many practitioners found different ways to use it; Pudovkin believed that shots were like bricks, to be joined together to build a sequence. Eisenstein, on the other hand, favoured a more disparate method: he believed that maximum effect could be achieved through an interleaving of shots which did not fit perfectly together, endorsing a montage sequence which served to 'jolt' its spectators (*see:* Bordwell and Thompson, 1997:458)

[45] Eisenstein, however, sees montage as characterised a process of synthesis: that film is *constructed* rather than edited (*See* Monaco, 2000:216)

[46] *See:* <http://us.imdb.com/Title?0056119> *and* Bordwell and Thompson (1997:328-9)

projected and, like the photograph, its image is indexed through presence or absence of light. Although for film, the reel is fed through focused light and projected. The reel contains collections – sequences – of still frames: only on projection is animation created. For Eisenstein 'cinema is able, more than any other art, to disclose the process that goes on microscopically in all other arts' (1977:5). The projection of light creates a narrative sequence within a virtual space – one which a projector mediates.

History is replete with examples demonstrating the dialectic of the 'virtualisation' of space. In the 1823 it was the diorama[47]. In the 1950s, 3D cinema was realised, to seemingly little effect[48]. In the 1980s, Disney created the virtual game-space in which *Tron*[49] (Lisberger, 1982) is set. More recently, cinema has moved into new territories: the creation of imax cinema brought to bear 'three-dimensional' cinema, where depth is added through the filtering of elements within the mise-en-scene into planes, creating a perception of action taking place nearby or far away. Imax has also moved into entertainment parks[50]. The introduction of multimedia and interactive games opens this dialectic further still: this is an area which I will discuss more explicitly in the next chapter.

Architecture and Film

'People do not live in places, but descriptions of places' - Wallace Stevens

Architectural and filmic practices are both spatial arts; both have their own conventions for manipulating space. However, it seems that architecture has a privileged, yet difficult relationship to film; geographer Michael Dear has observed that 'although architects frequently appeal to the filmic in both theory and practice, the converse is not always true of film makers and critics' (2000:178). So would a discussion of architectural principles within film be useful? In order for us to conceive of the creation of a studio film set, the building of *exterior* spaces within an interior studio shell was a prerequisite for classical Hollywood cinema. However, are true exchanges between both disciplines common? At first glance, it would seem unlikely that a successful architect would move into filmmaking, or vice versa; however, Eisenstein's architectural and engineering background could perhaps have justified his own interest in building his system, the 'montage of attractions' where cinematic space is aided through swift cutting, to create a surface intensity that propels narrative, whilst closely following the mood-changes of the soundtrack. Although Eisenstein went further; he is famous for alluding to Auguste Choisy's analysis of the Acropolis, with its references to human movement and the revolving angle of vision in architectural and urban space:

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[47] *See*: Friedberg, (1994:20; 25-9)

[48] *See:* <http://www.ddd.com/aboutus/articles/usatoday_march02.htm> and <http://www.keyframe.org/pdf/interact.pdf>

[49] A wealth of *Tron* games were developed across numerous platforms. The original arcade game was manufactured in 1982 by Bally/Midway. *See:* <http://www.gameroommagazine.com/tronxx01_1.htm> A clone of the original, *GLtron*, has been built as an open source Windows/Linux/MacOS game. *See:* <http://www.gltron.org/download.html>. Twenty yeas on, Disney Interactive have announced a sequel, *Tron 2.0*, which they demoed at E3 2002. *See:* <http://pc.ign.com/articles/358/358445p1.html>

[50] *See:* <http://www.sensesofcinema.com/contents/00/5/baroque.html>

> 'The Greeks have left us the most perfect example of shot design, change of shot and shot length. (...) It is hard to imagine a montage sequence for an architectural ensemble more subtly composed, shot by shot, than the one that our legs create by walking among the buildings of the Acropolis'[51].

In *Privacy and Publicity* Beatriz Colomina (1994) refers to the path Le Corbusier (1927) takes in *Towards a New Architecture*. Much of his work from the 1920s onwards arose from his own subjective positioning behind a movie camera – a notion he called 'promenade architecturale' – where the horizontal strip windows incorporated into his architecture from this period act individually as frames capturing the scene *beyond* or through. In this sense, Le Corbusier's houses built spectacles; they became mechanisms for seeing:

> 'The organizing geometry of architecture slips from the perspectival cone of vision, from the humanist eye, to the camera angle. It is precisely in this slippage that modern architecture becomes modern by engaging with the media'[52].

Le Corbusier was said to have designed 'with the camera', perhaps this is a concept which links closely with what Eisenstein called the 'camera eye'; where the spectator's eye follows an imagined (or pre-determined) route through a number of objects placed within the mise-en-scene. The immobile spectator becomes subject to diverse positions (compositions of framed shots and angles) yet in his/her physical immobility, they move 'through a series of carefully disposed phenomena (…) [observed with their] visual sense'[53]. Architecture is used as an agent for communication in film; it acts to anchor a story to a real location – as in *Notting Hill* (Mitchell, 1999), but by doing so, it also recreates that place through editing; a process which also creates *ellipses* within time[54]. I will return shortly to this notion of cinematic structuring, although I will briefly mention a symbiosis, or synergy between architecture and cinema: The Philips Pavilion in Brussels[55] was Le Corbusier's mathematical and architectural answer to the engineering of a building specifically designed to create the optimum conditions to house an orchestra. Obviously, this *had* been done before, but Le Corbusier created a structure – if you like, a studio-space – which provided scaffolding which would house lights, music, and projection of warped images around the interior. His *Poème Électronic* was a *container* for its objects; designed in this respect, it became a virtual space for the performance it would house. Similarly, this prompts the question that surely architectural knowledge *must be* called for in the interior organisation of a large studio set space? In an interior scene in *Back to the Future* (Zemeckis, 1985), Doc Emitt Brown exemplifies his lightning experiment through the use of a scaled architectural model of the entire film set – perhaps even the model initially used to necessitate the creation of the real set in the first place.

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[51] *Cited:* <http://www.nbm.org/blueprints/90s/summer90/page3/page3.htm>; *See also:* <http://www.doxiadis.org/documents/ekistics/doc_028.asp> for a technical analysis of this.
[52] *Cited:* <http://www.altx.com/ebr/reviews/rev7/r7buc.htm>
[53] *Cited:* <http://www.lukez.com/teaching/fall1999studio/fall1999studio_description.htm>
[54] Ellipsis is literally where time is compressed for the sake of narrative progression; so one hour – or a series of days – could be compressed into a sequence lasting five minutes.
[55] *See:* <http://www.nexusjournal.com/N2000-Capanna.html>

Furthermore, cinema screens are *housed* within architecturally engineered spaces[56] from the extravagant dream palaces of the 1920s and '30s in the US, to the Art Deco establishments of the 1930s to the '50s in the UK. Part of the experience of cinema, it could be said, lies not purely in the cinematic apparatus itself, but the imaginative ways in which it is housed in its setting. The building creates a mise-en-scene for the mise-en-scene within the film. As I have already briefly indicated, films themselves almost always arrange spaces; and these are often cities. Richard Ingersoll has suggested that '[a]rchitecture is the latent subject of almost every movie' (*Cit.* Dear, 2000:181). Yet film demands that architecture need only serve the plot, and thus there are no constraints on structure or space. In this sense, there is no way in which a film *set* can be construed as 'real' architecture as the process of editing allows for spatial ellipses. The labour of travel within film is therefore eroded as one sequence in one location can be as geographically separate from the next as the narrative demands. Yet cinema's history is replete with references to architecture: from Eisenstein's 'spatial eye', we consider depth of field and axis when we are presented with shots and sequences. So if real space offers no constraints within cinema, then cinema conveniently creates its own geography: within its own selective space. So when the creation of 'cinematic geographies' is allowed for by ellipses in cinematic editing, this in turn allows for the enveloping of dynamics of space and time.

The term 'pastiche' suggests an effacement of boundaries and separations, a process of gradual erosion of distinctions. Pastiche, then, functions as an aesthetic; one of quotations pushed to the limit. It incorporates multitudinous forms, serving up an imitation of older known and recognised styles: 'speech in a dead language (…) amputated of the satiric impulse (…) blank parody, a statue with blind eyeballs' (Jameson, 1991:17). Jameson's definition of pastiche illustrates a viable working reference – a guideline – for analysis of the use of space and time within cinema (and other new media), as it leads – as he suggests – towards Plato's conception of the 'simulacrum'[57]. The notion of the simulacrum has been popular with many critics since Plato; Gilles Deleuze (1983) cites pop art as a contending model, arguing that in the process of copying, the object becomes something different; an object in its own right, which takes on its own life. Jean Baudrillard sees the postmodern consumer society 'with its endless networks of media and advertising images that (...) precede any reality to which they might be said to refer' (1984:104) as his model.

Sparachino *et al.* (2000)[58] cite Paul Virilio's description of a loss of orientation found within cyberspace; he argues that the world becomes split between the real and the virtual, which he argues, causes shock, a kind of mental concussion. Sparachino *et al.* employ his argument in their attempt to formulate the terrain of 'cyberspace' into a 'navigable' city-scape. By doing so, they have created a virtual city called the 'city of news'. The screen-grabs they show of their formulation – a web browser which organises information in a city-like structure – shows large three-dimensional

[56] Consider the Warner Brothers studios in California; *See:* Monaco (199x: 206).
[57] In its simplest terms, simulacrum can be seen as 'a copy of a copy'; Jameson refers to photorealist paintings as his choice example of this process, as they are copies of photographs, which in themselves denote 'copies' of reality.
[58] *See:* <http://vismod.www.media.mit.edu/~flavia/Papers/CityOfNewsKOS.pdf>

building-like towers on a virtual landscape[59]; their structures made up of text and images. Mapped on information fed into it and rendered in a logical structure to resemble built cities, it is a truly virtualised space; a perfect simulacrum. In the virtual space – one whose structure seems to echo the confusing 'logic' of the Bonaventure, there is a feeling that we are no longer presented with a real geographical configuration: the Bonaventure is a space which finds Jameson deeply confused. The space inhabited by the Bonaventure, Jameson suggests, then becomes an imaginary one: a synthesis of mental architectures, of *topoi*. Quoting from different real cities, postcards, advertising, film, the 'text' of the Bonaventure becomes a product consisting for the most part, of geographical displacements and condensations. Through this 'architecture' forged from multitudinous forms, a simulacrum-space begins to emerge, one which originated from a reflection of a reality yet became something so fragmented it lost any relation to the 'reality' it once reflected. Appignanesi illustrates this 'state of mind' by suggesting that we 'are living what has already been lived and reproduced with no reality anymore but that of the cannibalized image' (1995: 49).

The notions of textual pastiche – and simulacra – are both strong candidates for the depiction of city-space often represented in films. The 'city of news' reminds me of the simulated cityscape of 21st Century Los Angeles; it is a simulacrum: a filmed representation of a city comprising both *interior* and *exterior* shots edited into a virtual narrative order, a 'masked' city with neon lights, perpetual rain and darkness, steam and smoke and giant screens endlessly rolling corporate advertising. This depiction is found in *Blade Runner* (Scott, 1982).

In relation to *Blade Runner* (1982), Giuliana Bruno suggests that textual – postmodern – pastiche generates a text that 'makes a point about the city of postindustrialism (…) [it is a] polyvalent, interchangeable structure' (1987). Jameson's analysis of the film considers Kevin Lynch's notion of the 'alienated city' and a process of convergence:

> 'between the empirical problems studied by Lynch in terms of city space and the great Althusserian (and Lacanian) redefinition of ideology as "the representation of the subject's *Imaginary* relationship to his or her Real conditions of existence"' (1991:51).

It is this '*Imaginary*' relationship that introduces a further element: the notion of the 'imagined city' (Donald, 1999). A city is a space we 'know' from film, art photography and literature and cities are as much physical places as constructs of media and mind. There is interplay between 'real' and 'imagined' when we consider cities because cities are re-created in so many forms; *Blade Runner* offers such a transformation: a projection of the '*Imaginary*' city of the future.

Blade Runner has been often described as reflecting 'many of the essential features of the condition of postmodernity' (Harvey, 1989:323). Harvey also cites the *photographic* history of characters as signifiers of origin; characters (and replicants) negotiate their past lives and memories through collections of holographic

[59] *See:* <http://www-white.media.mit.edu/~flavia/CityOfNews/conImages.html>

photographs[60]. Scott Bukatman (1997) has suggested that 'holographic' photographs – explorable spaces by virtue of the 3D image scanners – are virtual worlds which he sees as 'cyberspatial': navigable 'texts' within the film which are used as vehicles to move the story forward.

As a city-space, then, *Blade Runner* offers a hybrid: Los Angeles in 2019 is an imaginary space made up of 'bits' of location shooting from New York, San Francisco and Los Angeles. (*See:* Sammon, 1996). These aspects all, I think, share the notion of simulacrum: the *reproduction* of spaces which quote from several sources, the streamed adverts and obscure lighting which 'mask' the mise-en-scene; the overriding darkness and rain which could hide clues as to what is truly *real* (if the 'real' exists anymore?)[61]. Part of *Blade Runner's* strength, then, lies in the sense of confusion created for the spectator: they are often called upon to make their own decisions about *who* to trust in relation to evidence presented to characters at different stages in the film. Can we trust what we see? It is this 'alienation', the spatial bustle of the LA streets, the rationing of 'light', perpetual rain and fake advertising that all add to this confusion, which seem to confirm a similar sense of confusion as that which Virillio finds in cyberspace.

It is with this sense of alienation, the feeling of the unreal (or overwhelming) that to me, seem to blend the 'confusing' *real* space of the Bonaventure, to the virtual (alienated) mise-en-scene of *Blade Runner*. If we adopt Jameson's vision of postmodern pastiche, we see evidence of this within both 'texts'[62]: the design of *Blade Runner* emphasises the coexistence of multiple historical influences and styles – particularly of architecture – and the stylistic pastiche of elements which in unison, constitute the 'change in built space' that Jameson observes within the Bonaventure. Perhaps another answer lies in the fact that both spaces are divided along an axis of physical and virtual? With the Bonaventure, this is much more difficult to examine, but a clue to the process of virtualisation lies in Jameson's thoughts on cognitive mapping. The space, he argues, *transcends* the capacities of the human body to map itself within; and 'machines' working deep in the heart of the space serve to remap the narrative of walking. Thus humans relate to the built space through devices which virtualise, or mechanically mediate, the process of moving around it. On the other hand, film, through montage, virtualises space through a culmination of multiple perspectives: we know that cinematic editing, as James Donald has suggested, had the advantage of allowing viewers to be 'simultaneously here and there' (1999:74) through knitting together different elements at different tempos.

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[60] This is an idea which is put to use in *Memento* (Nolan, 2001), where the lead character, Leonard Shelby, suffers from anterograde amnesia and is incapable of making 'new' memories; events in his life and key relations to objects need to be photographed and annotated, then placed on a large map he makes himself, showing links between people, objects and activities. His 'unknown' past, then is conversely not one which is programmed into him – as with the replicants in *Blade Runner* – but which is built on the basis of trust; what characters advise him to *believe* as the truth.

[61] A central theme to *Blade Runner* centres around the notion of sight: Deckard's tests for the replicants are optical examinations of both retina and pupil for movement. Similarly, in a closing scene, Batty claims possibly the most famous speech made within the film: 'if only *you* could see what *I* have seen'

[62] I am suggesting that Jameson uses both the space of the Bonaventure and *Blade Runner* as textual examples of what he describes as 'postmodern'.

Another, perhaps more plausible answer to this question might be provided not through thinking of the divide between physical and virtual, but through an acceptance that film has led us to perceive – imagine, even – the city (a physical space) in a different way. Donald has suggested that we see the concept of the city as both physical and *abstracted* space; this, for him, is what all cities have in common. Donald argues that there is a dimension of *virtualisation* that all cities begin to appropriate; this isn't to say that cities are *virtual* spaces, but more to return to the notion I suggested in the previous chapter of cities as 'plastic' spaces which fuel a notion of creative play: something which I will examine in following chapters in relation to games. People appropriate and *use* built space and ultimately the space itself guides (as in the Bonaventure) how we can – or cannot – find our way around (and whether we have to allow machines to mediate our movement from level to level). Both the Bonaventure and 2019 Los Angeles demonstrate this mutation in built space and the notion of abstraction at the level of the simulacrum; they are spaces that we don't possess human perceptual tools to be able to process successfully. Obviously, the Bonaventure is a *physical* space – and therefore *not* virtual – but yet, through pastiche, abstractions of angles and restrictions of movement which all create cognitive confusion, there is a sense of labyrinth-like confusion which makes it a space offering a feeling of 'unreality', as with *Blade Runner*.

What Donald does suggest, which to me offers another explanation as to how Jameson can link the Bonaventure space to *Blade Runner*, runs in the interleaving of the city as a physical space on the one hand, with the city as imagined environment. Donald does this by linking the city and its representations together; above all, he suggests, there are productive transactions between the two: the 'traffic between urban fabric, representation and imagination fuzzies up the epistemological and ontological distinctions and, in doing so, produces the city between the imagined city and where we actually live' (1999:10). Manuel Castells has suggested that the space of places was being superseded by a 'space of flows' (*Cit. Ibid.*:175), suggesting that physical space is somehow being overtaken. It could perhaps be suggested that these 'flows' exist by virtue of the intermeshing of physical and virtualised space; if space of places has become eroded by the 'dynamite' of cinema, in addition to a host of other mediums which also virtualise space – then perhaps we can explain Jameson's confusion and disorientation. Donald reminds us that film has changed the ways in which we imagine the city, just as the city is something that continually morphs, adapts and changes in its mould:

> 'One thing Cinema - or at least film - has continued to do since the nineteen twenties has been to teach its audiences across the globe ways of seeing and so imagining the modern city, whether or not they live in one. The imagined landscape of the city has become, inescapably, a cinematic landscape. But the city in cinema does not operate just as a backdrop. Nor is the representation of the city really issue. To use Lefebvre's term, film presents urban space as itself representational, as simultaneously sensory and symbolic' (1999:68)

In a sense, what seems to be at large here lies is the acknowledgement of a process of spatial stacking. Representations of space become stacked, or mapped, onto the real space itself and this, I think, is what Donald means when he suggests that city landscapes become cinematic landscapes. Spaces become known and remembered for

real historical events; for example, the memorial columns in Northern France which duly signpost the location of historical battles and commemorate lost lives, to areas of East London which were famously renowned for gangster activity. But this also happens with films, as Donald is suggesting, to a greater degreee; in 1999, the British Tourist Authority – capitalising on a wave of 'film tourism' – released a map of the UK featuring 120 locations where famous films have been located for shooting[63]. Here a cognitive map of a space – whether visited or not – will inevitably be built on a familiarity of its representations; and spaces gain kudos from this exposure as imagined maps of a representation of real space.

In another way, *Blade Runner* illustrates a stacking by interleaving physical and virtual zones: located in physical space (Los Angeles), in a virtualised time (2019), the film is dependent on technologies which are simulated for the sake of cinematic – and narrative - effect; the city has its physical layers and physical geographical configuration, but transactions take place mainly through virtualised processes: communications and transactions within the film are undertaken in a way we would understand as 'digital', Deckard's apartment is equipped with networked technologies. Giant screens relay information into fragmented sections of the mise-en-scene, offering light in an otherwise dark (and rainy) space. The film suggests that LA moves closer to modes of human existence where transactions are dually made physically and virtually. In *Blade Runner*, this is through 'video phones' and as these transactions increase in popularity, so cities begin to mould themselves around the technologies the public appropriate; so *Blade Runner's* mise-en-scene is equipped with booths where video-calls can be made and transactions are credited to an account. In our current climate, we can see some of these spatial changes when we consider the proliferation of cellular technologies and their use in public space[64]; here, a notion of spatial stacking will come into being as new spaces of technological consumption overlap and become located within public spaces; this, it has been argued, changes the dynamics of spatial relations between people.

This process of spatial stacking is perhaps crystallised by Paul Virillio's remarks that the 'city' has shifted state: 'the topical city was once constructed around the 'gate' and the 'port', the teletopical *metacity* is now reconstructed around the 'window' and the teleport, that is to say, around the screen and the time slot' (2000:26). Although the difference is honed through a divide between *physical* ports and *virtual* teleports, there is, it seems, a notion of a circuit running through imagination, representation, the body, the social, and the spatial; this circuit has existed for a long time, and it affects language now and has done so in the past. In the nineteenth century, there was a divide between emergent organic and mechanical metaphors to describe use of spaces: Freud's early research, for example, attempted to create a logical mechanism for understanding the workings of the organic human brain. The industrialisation of Europe throughout this period saw growth of networks of train tracks, mechanisms which allowed spaces to be traversed more efficiently than before in terms of time

[63] *See:* <http://news.bbc.co.uk/hi/english/entertainment/newsid_369000/369373.stm>
[64] Here I am drawing on an analysis undertaken on the use of mobile phones in public spaces, and the cultural spaces created by users of these technologies in public areas. *See:* (Munt [Ed.] 2001:205-222)

taken. Cities would become thought of as mechanisms, interconnected by modes of transport and nodal points within which goods were traded.

The areas I have identified so far within this section include pastiche, simulacrum, the breaking of perspectival rules (abstraction), stacking, editing and montage. For the remainder of this section, I wish to briefly consider the role of the camera in relation to virtual space as I examine the development of three-dimensional rendering systems. In subsequent chapters, I discuss all of the techniques I have outlined within these chapters in relation to our understanding of computer space (or game-space); all of the above systems, it seems, fit into the creation of interactive game-worlds. As I explore and examine the fantasy spaces of interactive games, it is my intention not to show them as something completely new, but to argue that these new spaces 'borrow' from existing studies. It is in the postmodern world of computer games where we see pastiche evoked most effectively. Spatial stacking and sets arranged for cinema compare with the stacking of objects (sprites) and textures within the frame of a three-dimensional game. Indeed, all games borrow heavily from cinematic concepts, as I hope to demonstrate by employing the term 'mise-en-screen' to examine the arrangement of game elements within the visible part of the game space. Before I do that, I would like to consider the virtualising of the camera in three-dimensional space.

CAD: The Three-Dimensional Virtual Camera

'Post-Modern space is more an elaboration of the Cartesian grid than an organic ordering' (Jencks, 1991:96).

In chapter 2, I considered the technique which the Wachowski brothers perfected within the film *The Matrix*, which became known as 'bullet-time', where a customised set, a software-based three-dimensional modelling application and wires were used to create an effect of holding an object (in this case, Neo) suspended, while fast cutting between cameras simultaneously filming the object allowed for movement around the object to create dramatic tension as Neo dodged bullets as they were fired. I will argue that Computer Aided Design (CAD) applications perfectly allow for this subjectivity. They do this by allowing a 'virtual camera' – or cameras – to be placed anywhere within a three-dimensional space. Following the application of correct techniques, any CAD package can be made to render such a sequence more cheaply than the specially prepared studio technique used within *The Matrix*. The effect of bullet-time appears in the game *Max Payne* (Gathering of Developers, 2001)[65], which we can be in no doubt, cites *The Matrix* as a prime influence: the use of phone boxes as agents to further the game's back-story (narrative), shoot-outs in dilapidated subways; and finally, a 'bullet-time' engine. Part of the code of the game allows for the player to activate this mode within the game and hence, the super-human technique employed by Neo which allows him to dodge bullets becomes an integral part of the interactive game: if you are being shot, activate bullet-time and you can dodge bullets.

[65] *See:* <http://www.maxpayne.com>

Computer Aided Design (CAD) has existed for over twenty-five years (Richens, 1997: 174), really becoming commonplace throughout the last seven years. Most game development houses will use CAD applications for the design of characters and objects within the game. *All* three-dimensional games use an 'engine' (a coded application) to allow the elements (objects and characters) within the game to be assembled together into the creation of an interactive space; the engine then determines *how* the user can move through the space and, simply put, provides the experience of play for them. I will cover games in more detail in subsequent chapters, but I want to briefly describe some of the applications of CAD, what it offers, and how it is used as a virtual testing space to realise the creation of built space. All 'classically trained' architects who still practice architectural drawing have either learned to use a CAD system, or hire CAD designers to realise their two dimensional concepts on paper within a three dimensional CAD space. The main advantage for architects is that CAD applications – when given all the information needed – can translate architectural plans from drawings into functional three-dimensional models which can be moved around. Everything in CAD – as in nature, as Cézanne has suggested – is modelled on basic shapes: blocks, spheres and cylinders (*Ibid.* 175). From these stock shapes, described by Richens as 'primitive'[66], it is possible to create far more complex shapes through the rotation, extrusion[67] and scaling of groups of objects.

Initially, CAD applications were created with the literal intention of speeding up the drawing process for architects; once the model is built within a 3D environment, the software can generate plans from any elevation the architect should require. Although CAD allows for more than this: within a CAD virtual studio-space, it is possible to 'see' the object being built from any imaginable angle; it offers a fluid form of visualisation. Yet CAD – as a system for building complex 3D shapes – allows for a degree of interaction and it is through its use, I believe, that we can understand the articulation of another form of virtualised space and the principles of navigation encoded into that space. Once information is entered into the system using an array of input devices (mouse, keyboard, tablet) the shapes drawn within the space can be rendered and subsequently viewed from any angle, through the placement and movement of virtual cameras and lighting. This virtualised form of space greatly differs from earlier examples I have mentioned, such as cinematic space, communicative spaces (such as telephones), or Internet 'chat rooms' because the entire 3D space exists *purely* as coded logic; the space is virtual precisely because it is a mathematical array of code held inside the program itself. 3D shapes do not exist as tangible objects as they are composed of vectors[68] which all have a mathematical relation to the other vectors within the object.

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[66] **Primative**: 'Original, not derivative; not developed or derived from any other thing; from which another thing develops or derives (…) unsophisticated, undeveloped or crude' (Brown [Ed.], 1993:2354)

[67] Extrusion is the process of creating three-dimensional geometry out of flat, two-dimensional shapes by drawing the 2-D shape along a path in 3-D space. This path, for example, could be a curve.

[68] Vector graphics are composed from mathematical information instead of coloured pixels (or bitmap images) as we might see with scanned pictures and images from digital cameras. This allows for the fluid modification of images without any loss of resolution. When a vector graphic is resized, the mathematical information is added to or subtracted every point simultaneously within the object; in

So because the application knows the size and scale of all objects held within the space, constant calculations are made so it can render the space from any angle whilst maintaining exact proportions between one object and another. All objects within a CAD application are represented by vector (numerical) information. As such a cube, as an object, takes its form as a series of plotted points within a space. In this case, the cube within the application is created by drawing lines between eight points. In a virtual sense, then, the application 'knows' how big the cube appears to the spectator when they stand 4 feet away; because the cube is made from connecting points on a 3D grid, calculations become easy to make, so the cube is proportionally bigger when the spectator stands 2 feet away. If it 'knows' the size of the cube, it can apply the same rule to any other objects within the space – enabling a space where objects are 'fixed' in relation to other objects within the scene.

In terms of design, then, CAD (unlike physical architectural practice) means a building can be realised from the outside inward – rather than built up through a systematic stacking of objects onto and into other objects. To exemplify this, imagine that a cube is drawn within a CAD application; a user is able to move to a point inside the cube and draw shapes within. As long as they can tell the application how big the cube is, all other relative shapes can be redrawn and rendered in scale or proportion to that particular shape. In essence, the principle of CAD illustrates – perhaps better than any other example I can think of – the notion of a truly virtual space; the application acts as a container for an object, or objects of any size. It offers true spatial elasticity, as all shapes can be re-drawn in accordance with where the virtual camera is positioned. More importantly, CAD aids the process of physical planning for this reason: before anything is built in physical space, an architect will know the proportions of the space within which s/he works. In this sense, CAD represents more than just a technical drawing aid. It is a fluid workspace: a studio of a virtually-defined size.

CAD employs the logic of a virtual camera precisely because a camera can be deployed and moved to anywhere within the workspace; all the application needs to know is where the scene needs to be viewed from, in order to render the desired viewing position at any time. For a CAD designer, there lies a subjectivity which partly owes itself to conventions of cinema direction; choosing where the camera is going to start – and where it will move to – throughout the duration of the scene. As such, scenes can be 'lit' with virtual lighting (from any angle), which dynamically changes as the camera moves. Although there are undeniable differences: when a designer launches a CAD application - or any 3D modelling application – s/he will start with an empty space articulated by a perspectival grid. Through an interface, they have access to a number of tools and options and they can begin to place shapes, objects and lights anywhere within the grid, whilst being able to move to any other point within the space. Virtual cameras in CAD applications allow for navigation in a way that can make us think of a cinematic camera and the language used to convey

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other words: a square would consist of four points (corners); the size of the graphic is denoted by the placement of the other points in relation to that point, and so, it can be easily and fluidly scaled simply by changing numbers.

camera movement is, perhaps unsurprisingly, similar: panning, tilting, rotating and tracking can all be emulated by the rendering engine within the application. In this sense, the application 'window' and the view rendered, incorporate notions of camera (or third person) subjectivity.

Another significant advantage of a process of 'virtualising' for CAD, is that aspects of physics become dynamic; 'natural laws' can be mathematically modelled or excluded at the user's discretion; in other words, the physics of three-dimensional space can be *configured* by the user. The notion of constructing 'performative physics' becomes far less useful when we consider the process of using CAD as a three-dimensional drawing tool; but within the creation of interactive games, the sense of laws of physics 'coded' into the game engine remain absolutely central to the interactive experience the user has. With interactive games, the coded physics of the space determine what the user can (and can't) do and hence, ultimately govern more than any other area of the game, how successful the game will be with users. The notion of coded physics (or laws) is something I will consider in significantly more detail within the next chapter.

5. Spaces III: 2D and 3D Game Spaces, Game Design, Mise-en-screen

Introduction: the Human Computer Interface

In order for humans to be able to cope with the arduous task of communicating with digital devices, visual interfaces were built. As computers increased in capacity and complexity, new means for layout and organisation were realised. Research into Human Computer Interaction (HCI) led to the development of the Graphical User Interface (GUI) a system which cloaks the fundamental functioning of the computer, wrapping it in something which endows the computer with 'amenable', 'trustworthy' and 'friendly' qualities[69]. The Apple Macintosh initially boots up and grins at the user, offering comforting reassurance that 'everything is okay'. On the other hand, PCs tend to boot up and test hardware using a black screen with white text: exposing at a slightly closer level the way in which the system can be *thought* to be operating. Interfaces work initially on the level of standard metaphors (*the desktop*) but they equally concern the calibration and optimisation of *input* and *output* controls, such as keyboards, mice and monitors; such devices only exist for the benefit of users; they offer means of creating *tactile* systems of interface and feedback with computers. As such, they are not so much a part of the computer but without them, the computer would be far less useful as a tool, which necessitates human interaction.

Before I examine game interfaces and spaces, I will briefly consider a well known interface metaphor, one which has existed for around 20 years: Xerox's *Star* GUI environment was developed in 1981 and its developers claimed at the time that 'an important design goal was to make the "computer" as invisible to users as possible (…) [and] easy to learn and remember' (Johnson *et al.* 1995:53). As the *Star* was designed to be a tool for distributed office-based computing, the interface was initially designed around an office configuration, as it 'represents a working environment, where current projects and accessible resources reside (…) Star users are *encouraged to think* of the objects on the Desktop in physical terms' (*Ibid.*55; *my emphasis*). Such a line of encouragement functions to compel the user to approach the GUI from a context of 'direct manipulation'. McCullough explains that 'the best single explanation of the graphical user interface is as a symbolic context for pointing (…) pointing combines well with language (…) reduces tedious typing (…) [plus] graphical displays present options and suggest operations' (1998:117). Through a notion of 'direct manipulation', then, we can understand the computer interface as a spatial layer which masks the real functionality of the computer, instead allowing iconographic representations of binary procedures. To the end user, this furthers the functionality of the machine; as each icon and button displayed stands in – in a visual sense – for executing a string of commands or recalling a procedure.

[69] Many software applications are built with customisable features. As many applications written for Windows really do little more than run a string of commands from a dos prompt (in text mode), the GUI interface is often built in as an afterthought. As such, these can often be customised to fit the user's (or client's) requirements. Many applications, such as *WinAMP* (Nullsoft), have thousands of downloadable 'skins' available for use with them. These skins literally change the outer surface of the application: the program sits unchanged beneath the cosmetic veneer. This trend for customisation is reflected by the availability of interchangeable covers for many mobile phones.

McCullough suggests that impact of the 'windows' style GUI changed computers because suddenly they became 'event driven' systems: an approach which 'implies that the computer immediately handles whatever you do, regardless of the device or logical context of its source' (*Ibid.*). The 'windows' GUI, then, provides a coherent ordering of an array of computer mediated events, assimilating them into a spatial metaphorical context which makes the process of interaction tactile by offering elements, such as buttons, checkboxes, lists and representational icons. Now, it seems almost impossible to imagine a computer system without a desktop GUI; twenty-one years on, the GUI principle seems set to stay. Computers – by their own digital nature and logic – represent the way in which they function through a *virtualising* principle. At base level, they perform strings of simple calculations at high speeds. Every programming language ever developed has been designed to move the manipulation of computer functionality away from its 'low level' (where programming works closely at a hardware level), into 'high level' (where a syntax is designed which more closely aligns programming with a human language). High-level languages were developed partially to save time, where 'commands' constitute an array of low-level commands and partially to make programming more accessible to humans. When we think of programming, now, we manipulate high-level languages through a GUI interface. In other words: when designing an application for *Windows* (Microsoft), we often use an interface – such as *Visual Studio* (Microsoft) – which allows us to deploy GUI elements into a working space and then add code to them; this level of programming is often called fifth-generation (5GL), as it works on a visual-metaphorical level (as a studio-space within which to work), where the programmer can 'switch' between code and design view.

In this chapter and subsequent chapters, I will argue that games are essentially interface mechanisms (which I will refer to as engines) which often function as language (or command) interpreters at base level. A game development company may start by generating a game engine, which handles manipulating graphics, sound events, user movement (or navigation), objects within the space and how the space can be appropriated (physical elements, such as lighting, gravity, what can and can't be done). The engine then draws together a multitude of elements: sound files, images, 3D characters and sequences them all into a game-space. I will later explore some of the ways in which these game engines become licensable commodities – like *Windows* itself – and ways in which they are customised or changed within different games and finally, some of the ways in which the engines are 'hacked' or manipulated by game enthusiasts.

Thinking through Interface

'If the game isn't interesting and engaging in the first 10 seconds, then it's not going to be fun'
- Will Wright[70]

Before I begin to examine the development of game-spaces, I will briefly consider the relationship between the user and the computer through *Windows*; it seems obvious enough that many desktop elements are placed as visual guides for users to

[70] *See:* <http://www.gamasutra.com/features/20010323/byrd_01.htm>

'track' progress with the machine: pie charts are generated to demonstrate used disk space, progress bars and percentages are displayed to indicate ETA (Estimated Time Allocated). *Windows* makes the computer account for *what* it is doing at any time: in this sense, it is both a spatial system for creating an interface-layer between user and machine and a reporting tool, offering feedback to the user at all stages. In *The Aesthetics of Virtual Worlds*, Lev Manovitch suggests that this feedback mechanism – which to me seems similar to Althusser's (1971) notion of interpellation[71] – works in the phatic sense to remind the user that two-way communication *is* taking place. For example, web browsers and software installers have animations which function to remind the user that they are functional. The animations exist for the users' sake and not for the computer; this is also in part revealing something regarding the nature of programming; code itself often has 'human' dialogue running through it to signpost the particular actions of the code at specific times; such annotation is looked on as favourable and professional practice. In a sense, then, the visual indicators coded into almost every aspect of computer interfaces, visualise the dialogue further; it is, I think, necessary for programmers (more so than users) to be able to 'see' what the computer is doing at any stage (a system within DOS commands often called 'verbose mode'), in order for a reliable process of code debugging to take place. In this sense, part of the role of the interface is to provide consistent sign-posting to the user: 'the machine reveals itself, it reminds the user of its existence - not only because the user is forced to wait but also because she is forced to witness how the message is being constructed over time'[72]. Of course, techniques for indication of progress are also frequently found in text-based applications[73].

Throughout my research, I was lucky enough to get a chance to speak to Jon Rimmer, a research fellow in the school of Cognitive Science (COGS) at the University of Sussex. Much of his research focuses upon recommending strong usability practice and one of the significant points he made me aware of concerns how we might approach thinking about different kinds of interface. He specialises in web-based technologies and a distinction he drew between designing a 'useable' interface for an e-commerce site and designing an interface for a game lies in the amount of participant concentration – patience, even – available. His suggestion is that game users will persevere with gaming interfaces in a way that no other sector will allow – if a web-based user interface seems daunting at first glance, the user is likely to take her custom elsewhere. With games, the premium is slightly different; experienced users of games are used to the fact that with a new game comes a period of learning

[71] Althusser's notion of interpellation serves to illustrate a communicative loop within society. He applies this theory to the various apparatuses of the state, for example: the police. According to this view, the subject (viewer, listener, reader) is constituted by the text, or the subject, undertaking the summoning. This notion, referred to also as a process of 'spontaneous identification' (Donald and Hall, 1986: xvii) is exemplified by Althusser as a knock on the door which serves to 'position' the subject, whilst acting as an 'agent' for response, so when the door is opened after a knock (summoning the subject) 'we recognize that "it is him", or "her". We open the door, and "it's true, it really was she who was there" (1971:161). Interpellation has been frequently used in the analysis of media texts, as 'a pre-existing structure, the text interpellates the spectator, so constituting him or her as a subject' (Lapsley & Westlake 1988:12).

[72] *Source:* <http://www.heise.de/tp/english/special/sam/6030/4.html>

[73] For example, a simple animation using a sequence of characters within the same space, such as '-', '\', '|' and '/' cause a seamless process where the computer 'looks' like it is processing.

the system. They have purchased the game knowing at outset that they will need to invest considerable time in learning the controls and understanding the physics of the game. This, I think, is what makes game interfaces (and spaces) such a fascinating area of study; they are often complex systems to master and many games have 'tutorials' built in to interactively walk the user through the game-space before immersing them within the game. For the remainder of this section, I will begin to set out a framework for thinking about game interfaces and spaces.

Game interfaces can be designed poorly at outset. On examination of his recent strategy game, *Black and White* (Lionhead, 2001), Peter Molyneux – lead programmer and founder of Lionhead Entertainment – addressed the issue of game interface design at an E3 conference in 1999[74]; demonstrating a beta release of *Black and White*, he discussed the evolution of interfaces within his games throughout his programming history from *Populous* (Bullfrog, 1989) to *Black and White* – suggesting that he felt that the latest game interface was their finest contribution to date. With comical embarrassment, he mocked one of his previous releases, *Dungeon Keeper*, attributing the game's poor design to the fact that there were 180 different icons within the game's menu system that the user needed to understand in order to play the game[75]. Taking lessons from past projects, the *Black and White* interface contains no icons; all interaction is undertaken through using the mouse to guide a 3D virtual hand around the game-space; guide the hand to a point on the landscape and hold the left mouse button to 'pull' towards it. At the 2001 Game Developers Conference, Peter Molyneux described his approach to the 3D interface:

> 'In Black & White traditional icons and menus are replaced by an interface that closely resembles our natural interactions in the real world. We view the Black & White hand as an extension of your own hand'[76]

What would have been previously accessed through icons is now accessed through a system called 'gesturing' something which the *Opera 5* web browser also takes advantage of; commands are activated through drawing shapes on the screen with the mouse[77]. In *Black and White*, performing 'miracles' within the game-space can be undertaken through drawing one of a catalogue of gesture shapes with the hand, or through finding any of the 'one-shot' miracle bubbles and activating them by breaking the bubble and spreading the miracle accordingly. The tactile game interface within *Black and White* is addictive; in fact, *PC Pro* magazine has demonstrated that the interface is so usable – and becomes so familiar with use – that other, familiar interfaces are read against it:

> 'if you think of it as a user interface into a world of data, objects, methods and properties, then there's a strong case for applying some of its [*Black and White's*] incredibly intuitive features to a standard desktop OS, because quitting the game and returning to the plain Windows/Linux shell is a real letdown' (August 2001:254)

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[74] *E3 1999 Webcast:*<http://real.mfi.com/ramgen/gamasutra/molyneux.rm>
[75] *See:* <http://bwvault.ign.com/features/Dailyfeature/BFTP6.shtml>
[76] *Source:* <http://www.immersion.com/downloads/blackwhitegdc2001handout.pdf>
[77] *See:* <http://www.opera.com/windows/mouse.html>

Throughout this section, I hope to illustrate that what we call the 'interface' is both system and metaphor – and it is the interface mechanism which sits at the heart of all interactive games. Mastering – or understanding – a game (or a game genre) conveys an understanding of the interface itself (a system or metaphor); this is why successful standards set are often emulated; Microsoft's *Windows 95* was said to have taken many of the Apple Macintosh's most appealing desktop features from 1984 and onwards and built them into their system; in other words: Apple's interface proved to have caught on and its successes in design were appropriated for Microsoft's later steps. So interfaces become popular through user appropriation and familiarity. I will be considering the evolution of game interfaces through stylistic developments which over time became popular; if a game development company can create a successful interface, everything else often fits into place. This, I will argue, is a key reason for the popularity of certain interactive game forms and their numerous 'clones' such as *Doom* (id Software, 1993) and *Tomb Raider* (Eidos, 1996). In this chapter, I will sketch an archaeology of interface forms, from puzzle games, such as *Lemmings* (Psygnosis, 1991) and *Myst* (Cyan, 1994), to early 3D games, such as *Elite* (Acornsoft, 1984) to the popular genres of 3D game interface seen in more recent games.

Most interactive games now come with programmed interactive training routines where a computer controlled 'coach' walks the player through an adapted space, setting tests to allow the user to master the controls and game interface step-by-step. These sessions often give feedback and report to the player afterwards. In essence, these game coaches form similar roles to the sometimes less successful 'intelligent agents' incorporated into desktop applications, namely Microsoft's *Office* series. Unfortunately, clippie, the eponymous paperclip – often subject to severe criticism[78] – is often seen as patronising and misplaced. The coach in a game – by virtue of placing the user within the game and training them at outset, seems to have found a more amicable route into providing help and support which – it seems – is not so scorned, yet provides a brief introduction to 'how' to use the interface; something which *is* important considering the cost of games. I will now consider the development of interfaces by thinking about games as creating spaces for interaction.

Game Spaces

So what does a game interface have to do with space? Aki Jarvinen has suggested that interactive games are 'spatial toys'[79] and indeed the exploration of space is a pleasure that seems to unite various kinds of games. When we consider the use of spatial metaphors, such as 'doll's house' to describe *The Sims* (Electronic Arts, 2000)[80]; 'paintball' to describe *Halflife: Counter-Strike* (Valve, 2000)[81], we can see spatial parallels being drawn with activities associated with forms of 'play' in the physical realm. Other more obvious translations and mappings of physical space for

[78] 'It looks like you're writing a letter. Do you need help?' (Clippy: Office XP) *See:* <http://www.microsoft.com/office/clippy/> and also a selection of anti-Clippy Flash movies: <http://www.microsoft.com/office/clippy/downloads.asp>
[79] *See:* <http://www.ruutukaappaus.com/aki/ceevee.html>
[80] *See:* <http://www.wired.com/wired/archive/8.02/streetcred.html?pg=14>
[81] *See:* <http://paintball.hlcenter.com/> *and* <http://www.digitalpaintball.net/>

'play' include Microsoft's *Train Simulator* (2000), *Scalextric* (Leisure Genius, 1986)[82] which virtualised the popular Scalexric sets[83]. The *Micro Machines* (Codemasters, 1993)[84] game series has outlived the toys manufactured by Galoob, who went out of business in 1998[85]. Finally, the Danish LEGO group produce a plethora of interactive games and multimedia to complement their toys[86]. Indeed, the name was formed from the combination of two words: "LEg GOdt" or "play well". In Latin, the word means "I study" or "I put together".

Throughout this section, I will begin to consider how 'spaces' within interactive games have evolved from the early 2D spaces of 8-bit computers in the 1980s, into the labyrinthine 3D worlds of recent games.

Understanding Games: The Question of Interactivity

Space War (1961) for DEC's PDP-100 mainframe is often cited as the first *recognisable* game to be produced[87] although Espen Aarseth has claimed that as far back as 1947, a checkers-type game was designed with the ability to 'learn' as it 'plays'[88]. However, *Space War* is a good starting point and as such, is recognisable in its development as a game because of its attributes: no longer modelling existing game systems – such as a checkers game – *Space War* was designed as an additional 'toy' or gimmick, which was bundled with the operating system software for the mainframe. It perhaps also marks the beginning of the rise of competitive – or multiplayer – computer games because it is a two-player game with graphics. All the game-play occurs within a 'space' confined within the round screen of the PDP-1s monitor[89]; the game placed a series of pixels on the screen to represent stars and rendered a circular planet in the centre of the screen. Two ships are drawn either side of the planet and the game-play functions around orbiting the gravitational pull of the planet, whilst trying to destroy the opponent's ship. So *Space War* came to represent both the first successful attempt at using a computer to create a game – or genre – which has not previously existed in another format.

Initially, *Space War* was designed for entertainment purposes – as games often are – and Brenda Laurel (1993) suggests that the game represented what we can think of as perhaps the earliest evidence of the computer being used to facilitate interactive play; it's potential, for Laurel, 'lay not in its [the PDP-1s] ability to perform calculations but in its *capacity to represent action in which humans could participate*' (1993:1; *my*

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[82] *See:* <http://www.ysrnry.co.uk/cgi-bin/infoseek.cgi?regexp=scalextric>
[83] *See:* <http://www.scalextric.com/>
[84] *See:* <http://www.genesisproject.co.uk/Genesis/L-m/MicroMachines.html> *and* <http://www.mobygames.com/game/sheet/gameId,3887/>
[85] The series of games caught on and have been released steadily – on different formats – since 1993. Infogrames are releasing a new version of the game for Sony's PlayStation 2 console and Microsoft's X-box. Both are due out in November 2002; *See:* <http://ps2.ign.com/articles/363/363361p1.html>
[86] *See:* <http://www.lego.com/games/> and <http://mindstorms.lego.com>
[87] *See:* Levy (1984); Haddon (1999); Laurel (1993). There is also an emulation of the game, which can be found at <http://mevard.www.media.mit.edu/groups/el/projects/spacewar/ >
[88] *See:* <http://www.hf.uib.no/hi/espen/papers/space/>
[89] *Spacewar* can currently be seen on restored PDP-1 hardware at the Game On exhibition in London's Barbican Centre until September 2002; *See:* <http://www.gameonweb.co.uk/>

emphasis). Laurel's notion of a space within which a performance takes place is primarily where my interest in the phenomenon of gaming lies; and within the next section, I will focus closely on player-game and player-player interaction to try and uncover some of the pleasures offered by interactive gaming. The gaming industry – now already huge as I mentioned in Chapter 1 – and its multitudinous content, creates software which serves up 'spaces' within which a process of interaction takes place. At its most literal level, the phenomenon of 'interaction' generates a state where a user can become directly involved with the action they see. Ted Friedman has suggested that any exchange between a reader and a book 'is always one-sided; no matter what you do on your end, the text always remains the same' (1995:42). With games, a notion of double coding is taking place; the game itself is coded to allow the user to *interact*, or *play* with it. On the other hand, as the user interacts with the game, their responses affect the outcome of the code. An interactive game, then, is one where the user changes the game's state – the configuration of the code moving between registers within the computer at any stage – just by *playing* (interacting) with the game. In other words, the player codes the game as the game codes the player with its interface and space. I will return to this notion in more detail in the next section when I consider the ways in which games are customised by the players themselves.

However, any notion of interaction has its pitfalls. Andy Cameron (1995) has suggested that in many respects, encoding real 'interactivity' into a game is primarily impossible to achieve – and thus he sees 'interactivity' as a con. With existing narrative forms, he has suggested, satisfaction is gained from a sense of completeness, one of a story unfolding with a set outcome – literally: a beginning, a middle and an end – his suggestion is that so-called interactivity, precisely by offering the prize of control to the user, removes the narrative shape and structure from the piece. For him ultimately, an 'interactive' narrative is by no means a complete construction:

> 'every successful form of communication involves protagonists, a set of conflicts and experiences, and at the end some sort of resolution so the thing has a satisfying shape. Interaction largely destroys all that. By giving the audience control over the raw material you give them precisely what they don't want. They don't want a load of bricks, they want a finished construction, a built house'[90].

Cameron's suggestion *may* hold some validity – we could see interactive pieces as detracting from a sense of complete narrative shape: a story with a beginning, middle and end – Although it is my belief that any notion of 'interactivity' is coded into a game in much the same way as 'narrative' is coded into text. The major difference between narrative forms and interactive forms, then, lies in the fact that one has a linear progression, whereas the other offers a series of paths; all of which have outcomes coded into the content. In *Black and White*, Peter Molyneux has taken much pride in stating that the game has a strong narrative engine running through it. *Black and White* is not a game with a set linear storyline in the way that *Space Invaders* (Taito, 1979) – if it even has a *narrative* at all[91] – can be explained, as the

[90] *See:* <http://mfj-online.org/journalPages/MFJ28/Dissimulations.html>

[91] There is no real story as such to *Space Invaders*, but if there is, it would take the premise that the player controls a graphical gun at the bottom of the screen and has to shoot through lines of advancing

game, like many earlier games, works on the basis of completing stages where the player moves from one level to the next[92] in a linear fashion. In *Black and White* – as the title perhaps suggests – the player makes decisions on how to play the game: they can decide to be good or evil or anywhere in between. As their actions are taken, elements of the game begin to change in accordance with their decisions: if they are evil, their hand will begin to morph into an evil representation with a clawed, dark looking hand. If they are good, the hand will develop a white and holy aura. What drives the story engine are missions set by the villagers themselves and the player's two advisers: daemons who represent both good and evil choices who guide the player through the game. I will discuss *Black and White* further in the next section.

Many early 2D games offered a strong linear sense of progression on a level-to-level basis where a player would start on level one, which increments each time, much in the way *Tetris* (Pazhitnov, 1985) works. In many early two-dimensional games this was the case, although genres such as the text adventure game, such as *The Hobbit* (Melbourne House, 1982), narrative functioned along the lines of forging paths through a text depending on what the user chose to do. This narrative model, which I will examine later, follows a literary tradition found in so called 'role play' books, where the reader makes choices and turns to different pages depending on their decision. The 'role playing' - or 'dynamic' - narrative model tends to be the most used within 3D games, such as *Black and White* (Lionhead, 2001) and *Grand Theft Auto III* (Rockstar, 2001) and, I think, will offer us a strong framework from which to begin analysing interactive games.

This distinction between 'linear' and 'dynamic' to me, opens out Andy Cameron's argument somewhat and perhaps solidifies some of the ways we can think about interactivity. Indeed: interactivity, for me at least, can be seen as something where 'choice' is encoded into a game. The more *interactive* a piece may be, is dependent upon the degree of choice encoded into the piece itself. In this sense, perhaps Cameron's notion of a 'load of bricks' can be more usefully thought of in the context of a game interface which allows for interactivity, precisely by offering the user 'choice', which effects the outcome of the game. I will return to Cameron's arguments within the next chapter when I consider games and adaptability. I will argue that Cameron's 'bricks' *can* effectively be applied to games which allow for user-customisation and adaptation: a common trend found within new games.

The Evolution of 2D and 3D Games: Spatial Mapping and Navigation

On opening the *The Hobbit* (Tolkein, 1937/1993), we see a map of the fantasy world in which the story takes place[93]. Both map and story were ordered into a structured

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aliens; once cleared, the player moves to the second level: itself largely a repeat of the first, only with faster moving aliens. Although *Space Invaders* as a cultural product (and phenomenon) has a fascinating historical story which has been documented in King [Ed.] (2002) and: <http://spaceinvaders.retrogames.com/html/history.htm>

[92] Another example of this form of story progression can be found in *Rainbow Islands* (Ocean, 1990) or *Bubble Bobble* (Taito, 1986); even *Pac Man* (Namco, 1980) where the player moves in sequence from one level to the next.

[93] *See:* <http://www.multimania.com/lafee/mirkwood.html>

space; an adventure game released on many 8-bit home computers in the early 1980s. As a game, *The Hobbit* (Melbourne House, 1982) functions to 'map' the space the novel created – only within the game the user controls the sequence of events by deciding where to go next. Using a language system called 'Inglish'[94], the characters are able to move around, to talk at specified intervals and – if certain conditions within the game are met – can offer help. The game is programmed to understand simple instructions and was designed to respond to a series of commands formed into a logical sentence[95]. In a very literal sense, then, what *The Hobbit* (by no means the first adventure game created) does is model – at a structural level – a narrative story; it created a scientific form – a language – for navigation and interaction. There is an equal sense that using an adapted method of Propp's approach, one could list and map the exact outcome of interaction between any characters within the game and so place them into a logical map of specific roles and functions[96]. *The Hobbit* follows events within the novel but by doing so, creates a logical and structural system allowing the user to traverse the text according to their own path, articulated through an interactive language system. *The Hobbit* game was distributed with the novel – as were the subsequent adventure games made from Tolkein's *Lord of The Rings Trilogy* (*See:* Tolkein, 1954-55/1995) and (Melbourne House, 1986; 1988; 1989). As such, there was a sense that both were used in tandem; as clues prompted by the novel would inform the way the user plays the game. By reading the novel, then, the user would gain valuable clues as to what they do within the interactive game. It could be argued that such a crossover lead to an early example of *intertextuality* – or a cross-pollination of formats – within games; films rights had been licenced to game developers before this time[97], although these often bore little similarity between formats, only taking existing narrative structures and creating games which allude to the film story. Although the Melbourne House series of adventure games required a user's knowledge of the geography and context embedded within the story and as such, the novel was *highly* useful in order to play the game; perhaps this was evidence of an early form of game licensing. Popular computer magazine *Crash* explained the symbiotic relationship in its review of *The Fellowship of the Ring* (Melbourne House, 1986):

> '[it] is more than just a sales ploy as it [the novel] contains important background and clues to your quest. Furthermore, it contains maps of The Shire where you begin the adventure, and the whole of the western section of Middle Earth by which you can gauge the threat emanating from the east'[98]

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[94] *See:* <http://www.sincuser.f9.co.uk/012/mindgms.htm>

[95] The disassembled source code – including the complete list of 'tokens': words which can be used in 'syntactical' conjunction with others, complete with a breakdown of how the game 'understands' grammatical sentences, can be found at: <http://www.icemark.com/downloads/index.html#Spectrum>

[96] For example, at the beginning of the game, the player (Bilbo) holds a map. In order to read the map, they must give it to Elrond and ask him to help. When the player is trapped in the Goblin's dungeon, they need Thorin to help them escape. The structure of the game – and the rules of Inglish – are described in the FAQ for the game, *See*: <http://db.gamefaqs.com/computer/c64/file/hobbit.txt>

[97] For example, *Kong* (Ocean Software: 1983), where the player has to rescue a woman from Kong's clutches and destroy Kong to complete the game.

[98] *See:* <http://www.mjwilson.demon.co.uk/crash/26/rings.htm>

So how does this game interface work and how does playing the game differ from reading a novel? The user has to learn the story, history and context of the trilogy; co-locating knowledge gained from the novel to the puzzles posed by the game. They have to become aware of the characters and the way the game presents the story – as text and images with a command prompt – and in many respects, the user has to learn a specific *syntax* of grammar – if you like, a *meta*-language – to enable them to best engage with the game. Visually, the mise-en-screen is split into two sections: the representational image of the space through the character's eyes and below, the command line for input. Text within the command area prompts the user to action: 'You are in a comfortable tunnel like hall. To the East there is the round green door. You see: a wooden chest. Gandalf. Thorin. Gandalf is carrying a curious map. Gandalf gives the map to you'[99]. From the moment the game begins, then, the user is presented with an array of possible questions: What lies through the green door? Who is Gandalf? Who is Thorin? What is in the wooden chest? Can the chest be opened? Why has Gandalf given 'me' a curious map? This is where interactive choice calls the player to action.

Of course, The Hobbit *is* a finished construction: a complete story, much like the novel only a mapped re-working. In as much as any film adaptation represents a re-working of a novel, it seems an object in its own right. It is not, I think, simply a load of bricks, yet it is an interactive form. It is a space with an interface for control. It is a space because it is navigable; we *know* at outset that we can move 'East', so whatever constitutes 'East' must correspond with a compass within the game itself; if we move 'East' and we find ourselves in an adjoining room, we will know that moving 'West' will get us back into the tunnel like hall again. In essence, what the game does is *virtualise* the space created by the novel; rendering it as a space that can be appropriated – the compass coordinates are built into the game to enable us – as players – to 'gain' our own bearings within the virtual space.

Computers have been used to create navigable adventure games for a long time. In essence, the popular *Myst* (Cyan, 1995) series follows on from this. As a game, *Myst* has been referred to as an example of 'virtual tourism' (Herz, 1996); Stephen Poole sees the game as a form of escapism; a beautifully rendered space where the user is free to explore (2000:99). Espen Aarseth suggests that *Myst* encapsulates an experience which is closely linked to 'hypertextual navigation'[100]: the game itself is a graphical labyrinthine structure composed of interlinked still images. The navigation system, as Aarseth suggests, 'presents a graphical "click'n'go" interface over the classical adventure game structure' (*Ibid.*); all still images are linked with "hot spots" which enable navigation from one image to another. Interactive adventure games, like *The Hobbit* and *Myst* are 'closed' spaces – the user *cannot* do what the game *doesn't* allow – although these rudimentary spaces also developed along a different route: into Multi User Dungeons (MUDs), which I will discuss in the next section,

[99] This is at the beginning of *The Hobbit*: an online Java implementation of the game can be found at <http://www.emuunlim.com/hob/hobbit.html>
[100] *See:* <http://www.hf.uib.no/hi/espen/papers/space/>

and the popular Massively Multiplayer Online Role Play Games (MMORPGs)[101], where users can 'subscribe' to a giant interactive game space and play online.

Universes in Bytes: The Coding of Early Game Spaces

Before I consider the user appropriation of complex game-spaces found within many new game engines, I want to briefly consider how some earlier game spaces were created. It seems to me that programmer creativity lay at the forefront of space design in earlier games, largely because they were working on machines with little memory and basic hardware; so writing concise code was of a premium. I will select a few 'key' games to demonstrate some of the techniques for creating large spaces for play where efficient coding was paramount. With early machines, such as the spectrum, memory capacity was minimal[102] and games were 'mapped' out as they would be assembled in the computer's memory, with a limit set on *how much* memory specific elements of the game would take up. Many early Spectrum games, including *Atic Attack* (Ultimate, 1983) and *Manic Miner* (Software Projects, 1983) used the limited memory available to create game spaces which would set precedents – to be seen in countless subsequent games – which would demonstrate pushing hardware and processing boundaries to previously unconceivable limits.

What is fascinating about many early spectrum games is that they have now been disassembled by inquisitive programmers, who now revisit the games to see how the programmers created them so concisely. Many programmers use software emulators to recreate the architecture of the old computers on their existing machines. Using tools and applications, they can unravel the code as it runs within the virtual framework of the emulator, and often the results are posted onto websites[103]; this has led to PC-based remakes of many of the games, the creation of a collection of online resources which were previously unavailable and projects working to archive as much of a computer's history as possible while information is still available[104]. I will now demonstrate the kind of research undertaken into the reverse engineering of early games by drawing on Christopher Wild's breakdown of the code for storing all the different graphical elements for *Starquake*[105] (Bubble Bus, 1985). *Starquake* is vast in terms of game-size. The 'map' of the game has 16 x 32 'rooms' or screens (512 locations); each room consists of 8 x 6 tiles, each 32 x 24 pixels:

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[101] *For example:* Ultima Online (Origin) <http://www.uo.com/>, Asheron's Call (Microsoft) <http://www.microsoft.com/games/zone/asheronscall/>, Everquest (Sony) <http://everquest.station.sony.com/>, Anarchy Online (Funcom) <http://www.anarchy-online.com/> *and* Lineage (NCSoft) <http://www.lineage-us.com/>

[102] Early models had only 16K; later models had 48K of memory. To give a rough approximation of size, the *average* web page - if you include images - contains considerably more than 48K of information.

[103] *See:* <http://retrospec.sgn.net/> *and* <http://www.icemark.com/spectrum/index.html>

[104] *See:* <http://www.worldofspectrum.org/>

[105] A graphical dump of all the sprite information for the game can be found at <http://www.anam.demon.co.uk/downloads/files/starquake_graphics.zip>; a JAVA implementation of the original spectrum game can be played online at <http://www.emuunlim.com/hob/starquake.html>

> 'the platform gfx are stored in an odd way. The first 6 bytes are a bit mask to say which 8x8 block is available in the data. The data is stored in a 1x6 array so the maximum size of a graphic is 8x6 blocks or 64*48 pixels'[106]

The design of the game itself requires thinking about programming in terms of spatial dynamics. The code of the game creates a space for the player to appropriate, while the code used to create the space employs virtual arrays within the computer's memory for the game to unpack and organise the graphics on screen. In other words, the computer memory would not be able to hold all the information if each screen had to be drawn individually; and so with a stock of graphical assets and a set of rules for object placement, the game-space can be generated according to a mathematical principle, meaning that each screen (or room) within the mise-en-screen is drawn as the player moves from one room to the next, following its own logic until the space reaches its boundaries within the 16 x 32 grid. Similar formulae for game spaces would reappear many times for the creation of, for example, the 494 levels found in *Populous* (Bullfrog, 1989) and the 999 levels of *Populous II* (Bullfrog, 1991).

In some respects, the code works slightly like the 'seed' for the mandlebrot fractal set[107]; once the code for the array has been set, its execution then creates the space according to the coded logic and laws set out within the array. Once the space is coded, it is rendered on-screen. Once rendered, the space, in its entirety is mapped into the mise-en-screen[108]. What is important about these spaces, like fractal mathematics, is that they can *only* exist by virtue of computer calculation and display; a computer can perform iterative calculations (by repeatedly performing the same calculation) to create 'self-similar' models where any given level of magnification will produce shapes composed of the same base object. Similar fractal techniques are used to create the surfaces of planets within 3D games[109], snowflakes (Gleick, 1987:312-3), landscapes and trees[110]. Benoit Mandelbrot's initial mathematical ideas metamorphosised into relatively simple computer-based equations to build complex recursive shapes which closely resemble what we see within nature. In his own words: 'Clouds are not spheres, mountains are not cones, coastlines are not circles and bark is not smooth, nor does lightning travel in a straight line' (*cit.* Briggs, 1992:157)

So to conclude: at an early stage of game development, mathematical formulae could be built into the game-engines of games, which – whilst being extremely conservative

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[106] *See:* <http://www.icemark.com/dataformats/starquake/index.html>

[107] In *The Fractal Geometry of Nature* (1977), Benoit Mandelbrot argued that earlier geometric forms of modelling could not accurately (or easily) explain laws of repetition in nature. He set out to demonstrate a mathematical formula which contained information to enable drawing more 'realistic' looking objects found within nature, such as trees, clouds and mountains. Briefly, fractal geometry takes a 'seed' (say: a random number governing a starting point, or a shape such as a square). A square is drawn within the first iteration (step of calculation); for the second iteration, four more squares are drawn from the sides of each square (making a cross-shape of five squares). For the second iteration, the five squares are the same size as the original shape. For the third iteration, this process is repeated, creating twenty-five squares and so on. The geometry works on a principle of 'self similarity' meaning that any part of an object contains the same information as the original shape, only multiplied.

[108] Drawn <ftp://ftp.worldofspectrum.org/pub/sinclair/games-maps/s/Starquake_2.jpg>; as screenshots from another version <http://perso.club-internet.fr/west/Nostalgie/Starquake/plancomplet.gif>

[109] *See:* <http://astronomy.swin.edu.au/~pbourke/terrain/planets/>

[110] *See:* <http://www.csc.uvic.ca/~ahowe/fractal/fractal.html#1.%20Introduction>

with the amount of code used – could create vast spaces for user exploration. Interestingly, there was a trend with many early games to have maps published in popular computer magazines at the time. *Your Sinclair* magazine frequently mapped the spaces of computer games as A2-sized centre-pieces; many of which have been archived online[111]. It is my feeling that much of the pleasure derived from games lies in the fact that they largely concern the *creation* of navigable spaces. Indeed the 'type' of space generated by a game indicates to the experienced player firstly, the genre of the game and secondly gives them an idea of *how* the game is likely to function. In the next section I will consider some of the popular game-engines which have been designed to create specific genres of navigable space.

Early Game Interfaces

Yet the game-space is only one part of the whole. Games – by virtue of the dynamics of interaction – have interfaces built into them. In the case of a 'real-life' simulation, such as a driving game, this interface could be a graphical representation of the dashboard of a car[112]. In *Gargantua* (1996:93), Julian Stallabrass analyses a series of reviews for military flight simulation games, taking into account the language and terminology used to describe the action encountered within them. Although Stallabrass's analysis fundamentally examines the notion of player 'pleasure' – something which I will consider in the next section – he usefully suggests that games are primarily designed to be playable and fun, whilst *maintaining* a sense of realism. Indeed, simulation games are designed to align the player as closely as possible to the machine or situation they are simulating. Hence the interface, or Head Up Display (HUD) found in a game like *F117A Stealth Fighter* (Microprose, 1993)[113] is designed to replicate – as closely as possible – the control panels found within the craft itself. In other words: the simulation game needs to *look* and *feel* real. Microsoft's *Flight Simulator 2002*[114] purports to bring plane enthusiasts closer to experiencing flight situations within a number of different crafts, yet also functions to allow for a cheaper (and safer) alternative to private flying lessons. The game also has built in 'reality' levels; realising that the game could be used in a number of different ways, the game has been designed to be tailored to meet specific conditions; weather conditions (and turbulence) can be set; aspects of flight control can be assigned to the simulator to deal with – making the simulator easier to manage – and other conditions, such as gravity can be changed to suit the user's criteria.

Many game interfaces have been developed which were driven by icons and menus. Such interfaces, we could argue, have been around as long as the desktop GUI I mentioned at the beginning of the chapter; one of the most important aspects of interface, for me, depends on how well a situation on-screen can be dealt with by the

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[111] *See:* <http://www.comp007.freeserve.co.uk/Spectrum%20Magic%20Maps.htm>

[112] In *Test Drive* (Accolade, 1987) the player is positioned within the mise-en-screen as if sitting in the car seat; the car dashboard, dials and steering wheel are all presented in the foreground, while the game-space itself is animated in the space where the virtual windscreen exists. As an extra novelty, crashing the car would cause the virtual glass in the windscreen to shatter. *See:* <http://www.mobygames.com/game/adblurb/gameId,107/>

[113] *See also:* <http://www.mobygames.com/game/trivia/gameId,512/>

[114] *See:* <http://www.microsoft.com/games/fs2002/>

player. Icon-based games allow for the player to exert a form of 'direct manipulation' over the game and so many of the games that utilise interface routines often follow the lines of strategy – management – or puzzle solving. *Lemmings* (Psygnosis, 1991) is one such example. With its game-space scrolling from left-to right, the game is a direct puzzle solving exercise: a series of icons on the bottom of the screen allow the player to issue commands to the lemming characters[115]. *Lemmings* created a basic programming (or design) environment, where a player solves a puzzle by instructing individual 'lemmings' to perform tasks, in much the same way as one would use a tool within a software package like *Flash* or *Director* to issue commands to objects on the 'stage'. Through issuing commands to individual lemmings, the flow of 'lemming traffic' can be paused and diverted, until as many characters are able to exit the game-space as possible. Graphically, the game is rather simple; yet its appeal seems to lie in demands made on creative problem solving rather than reflex or skill – as with simulations or shooting games, for example. The game works on a 'point and click' principle, which is partially what makes it so addictive and easy to play: select a function for the lemming to perform from one of the icons on the interface at the bottom of the screen, then click on the lemming to apply the command to it.

This menu-based *direct manipulation* model of game control is an apparent function in many strategy games. For example, the *SimCity* (Maxis, 1989) series has a menu system that looks and works in a similar way to many commercial design packages. Adobe's *Photoshop* for example, has a toolbar carrying multiple menu options, click on the icon of choice and click in a selection or area and the command is undertaken within the selected space. *SimCity* – in many respects – is a design tool with a game built into it. The purpose of *SimCity* is to allow the user (who overlooks the whole of the city from above) to plan and create a city which they watch grow and develop. The player is put in control of every aspect of planning from laying electricity cable to setting tax levels. A city is built up by adding the necessary ingredients to the space at any time: these could be roads, railways, housing estates, airports, trees even. The game gives constant feedback to the user to remind them what their 'sims' need; it may be more roads, more schools or increased police influence. Creating a successful city-space, then, requires imaginative and logical planning of the layout; to make the inhabitant 'sims' feel happy, one needs to take into consideration providing enough services, modes of transport to accommodate a growing city, being sensitive to avoiding building residential areas near sites of industrial pollution and instead locating them near parks, lakes and fields, and so on.

One of the most important – and significant – aspects we can attribute to the popularity of this form of interface, is through its accessibility and logical structuring; when confronted with an interface system which looks familiar, the user – in a sense – is already able to get a feeling of how the game mechanism works by relating it to similar interface forms. Firstly, *SimCity* concerns management, so the icons and menu system reference a similar mode of management (and productivity); computer (GUI) management on the one hand and image manipulation (Photoshop) on the other. Unsurprisingly, although the *SimCity* interface has existed for a significant amount of time, the general format – despite increasing in complexity – remains

[115] Typically, such roles could include: blocker, builder, burrower, digger, climber, bomber and jumper.

largely the same. It is also regarded as a standard for games concerning management, for example *Age of Empires* (Microsoft, 1997) and *Command and Conquer* (Westwood, 1995). In the next section, I will consider the evolution of the *SimCity* game, as author Will Wright moved from designing city management to managing a house full of people in an American suburb. The interface changed for *The Sims* (Maxis, 2000) and Wright – much like Peter Molyneux – spent a lot of time thinking about how to move the interface away from the previously successful *SimCity* formula, into a new territory. In his keynote speech given at the Game Developers Conference 2001, he claimed he re-designed the interface ten times before the games' final release[116]. As with any game, successful interface design can either make or break a game. It seems that both Molyneux and Wright – having both developed successful game formats (and interfaces) – spent a long time concentrating on their new systems.

Designing Immersion: The Development of 3D Spaces

Stephen Poole has suggested that true immersion began only with the development of 3D games, citing *Wolfenstein 3D* as the first true immersive game (2000:45). In this chapter, I will attempt to unpack what Poole means by immersion, although I will also consider part of my definition of 'immersion' within games in the subsequent section, arguing that a sense of immersion is linked to player pleasure and affect as well as aesthetics.

In early 16-bit machines, such as Commodore's *Amiga* in the late 1980s, users saw the introduction of new presentation techniques such as 'parallax scrolling': the effect one sees when looking at a scrolling series of graphical 'layers'. In essence, parallax scrolling functions similarly to the visual 'layering' found in IMAX cinemas (which I mentioned in chapter two) and such a technique set a shift towards making landscapes in computer games 'appear' like they had depth. Parallax scrolling – itself really a 2D concept – works on the premise that each layer represents a distance from the viewer (a foreground layer, a background layer, intermediate layers). Distance is represented quite simply by speed of movement and the layers move at varying speeds dependent on their proximity to the viewer; so farther away layers scroll more slowly than ones in the foreground. This technique created an illusion of depth[117] within earlier games.

However, computers are now exceptional where representing 3D space is concerned; Lev Manovitch has claimed that the Cartesian coordinate system is in fact 'hardwired into computer graphics software and often into the hardware itself'[118]. Unsurprisingly, some of the early breakthrough 3D games have become 'cult' games now. *Ant Attack* (Quicksilver, 1983)[119] became the first game to use isometric

[116] *See:* <http://www.gamasutra.com/features/20010323/byrd_01.htm>
[117] *See:* <http://www.gamedev.net/dict/term.asp?TermID=320>. An example of an early game to use parallax scrolling is *Shadow of the Beast* (Psygnosis, 1990); where objects in the foreground moved faster than objects in the background as the player moves across the game-space.
[118] *See:* <http://www.manovich.net/text/mapping.html>
[119] *See / Play:* <http://www.emuunlim.com/hob/antattack.html>

rendering to create the game-space (according to the game's author, Sandy White)[120]. *Ant Attack* was the first game to allow the user to rotate through four isometric points, perhaps offering the first evidence of commercial usage of virtual camera techniques (something which is seen as 'standard' in games like *SimCity* and *The Sims*). Indeed, a review at the time of release described the ability to switch views: 'the effect is very like a scene in a TV studio where you can look at the action from four differently placed cameras'[121]. As the review suggests, *Ant Attack* caused much excitement when it was first released: the so-called 'softsolid' 3D rendering engine had a patent applied for as it became apparent that such a technique was to become standard in games to come. However, other 3D games had been created before this, including *Star Raiders* (Atari, 1979), which much like the later released *Rommel's Revenge* (Design Soft, 1984)[122] work in 3D but also feature 2D systems for mapping where other objects exist in relation to the user; working like spatial scanners as part of the mise-en-screen and game interface.

A year later, programmers Ian Bell and David Braben produced one of the most successful 3D games of all time: *Elite* (Acornsoft, 1984). Initially appearing on the BBC micro, the game has been ported over to numerous platforms (22+)[123] over the past 18 years. The game has an almost unrivalled string of fan websites and its main newgroup 'alt.fan.elite', still sometimes receives around 100 postings per day. It was the first game to be accompanied by a printed novella for back-story and context[124]. Perhaps more importantly, the game was the first to incorporate 3D wireframe graphics[125] into the game-space. As such, *Elite* made way for a new genre of game, but also employed several unrivalled programming techniques. One of the major developments with *Elite* – and hence, responsible for the game's success – lies in the fact that the game-space is a vast area to explore: there are eight galaxies and over 500 planets in each galaxy. Each planet has its own name, docking facilities, trade prices and a series of characteristics assigned to it, such as government type, tech level, followed by a brief description of the planet's inhabitants. In spite of this mass of information, in the original BBC version everything was coded into 32K of machine memory. What I think caused the most initial surprise when the game was first released, could lie in how *so much* information could be so tightly packed into code. David Braben, co-author of the game, explains that all the planets are generated:

> 'pseudo-randomly. (…) imagine a number sequence that looks random - like adding the last two numbers together, and only keeping the last two digits. You need to choose two numbers to start with, called the seed. Choosing 12 and 34 would give a sequence 12 34 46 80 26 06 32 38 70 08 ... (…) Such a sequence can then be used to give the planetary names, their coordinates, sizes, type of economy

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[120] *See:* <http://www.sandywhite.fsnet.co.uk/ants/anthome.htm>. The space of the game has been mapped out and can be seen at <http://www.whimsy.demon.co.uk/antattack/index.html>.
[121] *Source:* <http://www.mjwilson.demon.co.uk/crash/01/antatak.htm>
[122] *See / Play:* <http://www.spectrum.lovely.net/Rommel.html>
[123] *See:* <http://www.frontier.co.uk/games/elite/faq.html>
[124] If we exclude the adventure games which are based on novels (e.g. *The Hobbit*) and take into account the fact that *Elite's* sci-fi novella (*The Dark Wheel*) was written exclusively to accompany the game.
[125] Wireframe: a computer representation of a three-dimensional image, showing the outlines of all edges in a transparent drawing, as if the object was composed of wires. This drawing technique is often referred to as the 'mesh' in CAD applications.

> etc. (…) the only storage is the "seed" - which for Elite was six bytes for each galaxy (…) each galaxy used the same seed rotated by one (this is like dividing by two and copying the carry into the top binary digit)'[126]

Perhaps it is the vast openness of the game that generated such acclaim and affection. Ian Bell has suggested that if their game 'did anything, it invented the "open" game'[127]. The point he seems to be working towards here, is that *Elite* is a game where the player can literally 'exist' (most players of the game know of its addictive nature)[128]. In a sense, then, perhaps part of *Elite's* open qualities lie in the numerous ways in which the game can be played; Bell suggests that open games are ones where the gamer can play many roles and this seems reminiscent of Brenda Laurel's account of 'dramatic potential' within a game-space, which: 'refers to the set of actions that might occur in the course of a play, as seen from the perspective of any given point in time' (1993:68). Indeed, within *Elite* there are always a range of options to suit the playing style of the user; in terms of combat rating, the player starts off with the 'harmless' rating. The more combat the player engages in will determine their status. After fighting for a considerable amount of time, the rating begins to progress through a series of ranks. The player can also trade between planets (stock costs vary from planet to planet). There is a legal status involved, and the ship can be upgraded throughout the game to suit playing style.

Seven years on from *Elite*, in 1991, id software released *Hovertank 3D*[129], the first 3D game – they claimed – to be released for the PC; this was followed in 1992 by *Catacomb 3D*[130]. In that same year, id also released *Wolfenstein 3D*, the precursor to the first-person-shooter genre which I will discuss again in section III. *Wolfenstein 3D* held many of the ingredients for id's new 'killer app': *Doom*[131], released the subsequent year, in 1993 with a vastly improved 3D game engine. When *Doom* was first released, many college computer networks across the US collapsed under the volume of traffic as scores of undergraduates stormed file transfer (ftp) sites, all clamouring to download the fully playable (free) shareware release of a portion of the game. Like *Wolfeinstein 3D, Doom* was released initially as a free product; the shareware release contained the first of three 'episodes'. Other than this, it was a complete game in its own right. In *Joystick Nation,* J.C. Herz explains that 'it was an idea whose time has come. Release a free, stripped-down version through shareware channels, the Internet and online services. Follow with a spruced-up, registered retail version of the software' (1997:90). By 1997, 15 million copies of the original Doom game had been downloaded around the world (*Ibid*.84).

However, *Doom* was released with one significant addition over *Wolfenstein 3D*: the ability to play the game over a network[132]. This, in a sense, opened out a new way of

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[126] *See:* <http://www.frontier.co.uk/games/elite/faq.html>
[127] <http://www.gamesdomain.com/gdreview/archive/iview003.html>
[128] A strong indicator of this can be found in newsgroup postings and any of the number of *Elite* fan websites online. Due to the scale and open-endedness of the game, it has not been uncommon for players to amass several 'days' of live playing time.
[129] *See:* <http://www.idsoftware.com/games/vintage/hovertank/>
[130] *See:* <http://www.idsoftware.com/games/vintage/catacomb/>
[131] *See:* <http://www.idsoftware.com/games/doom/doom-final/>
[132] *See:* <http://www.3dactionplanet.com/features/editorials/fpshistory1/index2.shtml>

thinking about games; *Doom* created a space for players to fight against each other – it offered an arena, or a technology for staging combat rituals. However, id software offered more than this: by releasing detailed descriptions of *Doom's* file formats and game level and character editing software, they encouraged players to *expand* the game, to author their own levels and modifications for it. As a result, hacking and adding to the game became an essential part of its charm; new homemade levels and characters became widely available on the Internet for players to download and play with friends. Here was the birth of a new cultural economy – ultimately transcending the usual parameters of relationship between producers and consumers: its producers defined the basic structures of the game: the 3D rendering engine[133] – which I will discuss again in section three – and created initial sets of objects (characters, weapons etc.) and textures for walls, ceilings, floors and doors. They packaged these together with a few tips for making simple alterations to the game, adding the necessary tools to allow the players to build their own levels and avatars[134]. The world of the *Doom* game-spaces exploded; I will discuss this transition at greater length within the next section.

3D games offer immersive spaces: by locating the user within the mise-en-screen: by demonstrating their presence within the space as a hand holding a gun, the first-person subjectivity marked a shift away from many 2D games where the player controlled a 'sprite'[135] on screen within a game, often moving from left-to-right, towards a mode of play where the player sees the game-space from the 'protagonist's' point of view (hence, their own). In sprite based games, losing or getting 'killed' meant watching the character on screen 'die'. Within *Doom*, injury from being shot registers as a red flash on the screen and the subsequent subtraction of 'health' from the player. 'Death' within *Doom* finds the player viewing the game-space as from lying on the floor in a prone position: dead but eerily still able to see but unmoveable. The *early* 3D first-person games allow the player to walk around a pixellated cubist space. Everything within the space – and this is much more noticeable in the first few games – is quite obviously comprised of pixels; these got bigger the closer the player would get to them. Stock shapes were rendered in blocks as flat 2D images (textures such as floor tiles, water, metal floors and ceilings) were stretched, repeated and drawn onto a space resembling a 3D room, creating a bizarrely abstract spatial system which did not look real but proved *highly* playable. In *Gargantua*, Julian Stallabrass (1996:98) – rather scathingly but accurately – discussed some of the generic traits of early games, suggesting many contained glitches and continuity errors as in early films. On considering the 3D space of *Doom* he was quick to observe this abstract break from 'reality' when several of the labyrinth's monsters had been killed, their corpses lining the floor of the game-space: 'no matter how they fell, all the corpses of a particular monster always look exactly the same' (1996:94).

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[133] *See:* <http://www.idsoftware.com/business/home/technology/>

[134] The term 'avatar' originates from Hinduism, (in Sanskrit meaning literally 'descent') and refers to a 'manifestation of a deity or released soul in bodily form on earth' (Pearsall, 1999:91). The name has subsequently been translated into 'Virtual Reality', in relation to a movable 3D character, or a pseudonym and identity a player gives to themselves within Multi User Dungeons.

[135] A sprite is an animated graphic image drawn on the screen, controlled by a user with a mouse, joystick or a keyboard. Some famous sprites are Sonic in *Sonic the Hedgehog* (Sega, 1991) and Mario in *Super Mario Bros.* (Nintendo, 1985)

Similarly, Espen Aarseth considers the game as 'graphically crude' (1999:37) yet also playable. In *Allegories of Space*[136], he also mentions the fragmentations of perspective caused by rendering errors with the 3D engine which, in essence, became part of the charm of these early games. Later 3D games, such as *Grand Theft Auto 3*[137] (Rockstar, 2002) and *Metal Gear Solid 2* (Konami, 2001) create a fragmentation of perspective through dynamically switching subjective viewing positions to enable the player to 'see' from a number of angles. In this capacity, the game engine becomes its own visual director, making intelligent decisions as to where to 'frame' the action within the mise-en-screen, or by allowing the user to manually switch between any of a number of virtual 'camera angles'.

I'd like to try to briefly pull the content of the last three chapters together. I will do this by proposing that a process of convergence is taking place, which blends physical, virtual and computer-mediated spaces ever closer. Computer technologies, such as CAD simulations and applications, have expanded the potential for architectural realisation. Computer technology has impacted upon cinema in a dramatic way: digital post-processing has allowed for the creation of 'illusions' and effects to a standard unmatched by traditional studio apparatus (*see:* Darley, 2000 Manovitch, 2001). Throughout the next section, I will draw upon games to demonstrate the emergence of new interactive game-spaces. I will examine the role of the Internet in creating 'interest groups' allowing users to 'author' around games. Indeed, many gamers become 'co-authors' of a product by modifying and adapting commercial games, in order to enrich their own gaming experiences.

I see games – and gaming – as opening up new kinds of space for social interaction. Although such spaces are *new*, I will argue that they always resemble older spatial systems and – by doing so – are complementing these systems, rather than replacing them outright. Interactive gaming is a growing cultural phenomenon and there is a mass of information assembled by devoted fans to games which, I think, offer insights into how interactivity within games can be looked at and thought about. In the next section I will begin to examine how players think about, talk about, use and adapt single and multiplayer games.

[136] *See:* <http://www.hf.uib.no/hi/espen/papers/space/>
[137] *See:* <http://www.rockstargames.com/grandtheftauto3/>

III. Players and Contemporary Gaming

Chapter 6: Making Sense of Gaming: Affect and Intensities within Games

> 'popular culture (…) [is] one of the primary ways in which people make sense of themselves, their lives and the world' (Grossberg, 1992:69).

There is no doubt in my mind that gaming is very much an aspect of popular culture; a walk down any high street in the UK will reveal adverts for new games as well as adverts for contemporary consoles, such as Microsoft's *X-Box* and Sony's *PlayStation 2*. Before I move any further, I want to begin by setting out a framework within which we can consider gaming as a social phenomenon. In this chapter, I am going to focus upon how players *use* and think about games as cultural products. Although the study of gaming is relatively new in academic terms, many analyses I have seen so far seem to approach gaming either from the angle of *ludology* – analysing the mechanics of game play, or *narratology* – reading the game as a 'text' with a distinct narrative form. Upon taking games into consideration, we can I think, better understand this analytical divide if we think of Darley's use of the term 'interactive spectatorship'. Put crudely, we could group 'interactive' alongside *ludology* and 'spectatorship' – as always – alongside *narratology*. Is such a division useful? Darley has quite rightly suggested that games 'are kinds of audiovisual culture that *significantly reconfigure* the role and character of aesthetic engagement as it has traditionally been understood' (Darley, 2001:147-8; *my emphasis*). This is perhaps a strong signal for a decoupling of gaming from 'traditional' forms of *narratological* analysis – and yet, games create spectacle; within the limitative parameters of technological capacity, they always have. In hindsight, it seems difficult to say that there was anything 'spectacular' about the visual aspects of early 8-bit games – not so for landmark films, such as *Citizen Kane* (Wells, 1941) – but by virtue of the fact that programmers still marvel at the technical capacities of early games to the point of taking the time to reverse-engineer them, it seems that they too create spectacle and shared memories in a similar way to many other objects within the sphere of popular culture[1].

As I have discussed *narratology* in earlier sections, I will begin to unpack the concept of *ludology* from the perspective of game analysis. Jesper Juul – a programmer and game researcher – considers games as formal systems. As such, he argues that a system of analysis – a ludology – needs to be created:

> 'Games exist in a formal/algorithmic domain, stories in a domain of interpretation, and this means that games resist the evocative themes of stories, because they cannot be formalised'[2].

Similarly, Markku Eskelinen is quick to articulate a division between games and stories: '[i]f I throw a ball at you I don't expect you to drop it and wait until it starts

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[1] Throughout researching this thesis, the sheer *volume* of information I found regarding old ZX Spectrum content (reviews, pages dedicated to games, histories, archives) is truly staggering. A significant number of hobbyists – many of whom, I guess – remembered growing up around the technology and *cared* enough to preserve the technology's history, mirrors the kind of *relationship* many people have with music, cinema, novels, and the like.

[2] *Source:* <http://www.jesperjuul.dk/text/WCGCACD.html>

telling stories'[3]. Espen Aarseth suggests that a potential problem – from a perspective of narratological analysis – concerns what he calls ergodic[4] works of art. The problem with such forms lies in the fact that within 'play' or interaction:

> 'the experienced sequence of signs do not emerge in a fixed, predetermined order decided by the instigator of the work, but is instead one actualisation among many potential routes within what we may call the event-space of semio-logical possibility' (1999:33).

So this *does* prompt for a new (or different) way of thinking about games against other narrative texts (such as novels or films): games are *event*-based systems but they do not adhere to a strict narrative order. Ernest Adams has suggested that '[i]nteractivity is almost the opposite of narrative; narrative flows under the direction of the author, while interactivity depends on the player for motive power'[5]. Another distinction that I think, we need to establish here, lies in the question of whether there is a relationship between games and narrative. If we take a game like *Columns* (Sega 1995), *Mah-Jongg*[6] or *Tetris*, we see that framing the game within a strong narrative structure would prove difficult[7]. Other games are easier to perform narratological readings using the kinds of tools which have been available within film studies since the 1970s. Indeed, Greg Smith's reading of *Final Fantasy VII* – which I mentioned at the beginning of Section I in a discussion on narratological analysis – worked effectively in its analysis of the cinematic back-story and clearly demonstrated that the vast body of film theory *can* be put to use on cut-sequences or elements of back-story as game events, but does raise a question regarding the extent to which the two – games and films – should be separated at an academic level. Analysis *can* be undertaken which touches upon the use of 'narrative' in games and the numerous intertextual tie-ins between games and film. However, it is clear that this approach leads so far and doesn't completely address such terms as user 'action' 'interactivity' and 'immersion', all terms which I will consider in relation to theories on *affect* which I will introduce shortly.

However, interactive games *are* systems; which raises the question: why can't we rely on semiotic or formal modes of analysis to discuss them? Surely both formal and structural approaches lend themselves well to providing systematic frameworks for the study of cultural objects? In essence, the answer – for me at least – is although

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[3] *Source:* <http://www.gamestudies.org/0101/eskelinen/>

[4] He defines 'ergodic' as appropriated from physics and constituted through two terms - *Ergos:* 'work' and *Hodos*: 'path', or 'road' (1999:32). He suggests that such phenomena are produced by cybernetic systems (machines) and are capable of generating different semiotic sequences each time they are run. Naturally, then, he defines interactive games as ergodic works of art.

[5] *Source:* <http://www.gamasutra.com/features/designers_notebook/19991229.htm> *Cited:* <http://web.mit.edu/21fms/www/faculty/henry3/games&narrative.html>

[6] *See:* <http://www.gamingplace.com/download/preview/236659.html>

[7] Janet Murray – a narratologist – rather famously regards Tetris as the 'perfect enactment of the overtasked lives of Americans in the 1990s - of the constant bombardment of tasks that demand our attention and that we must somehow fit into our overcrowded schedules and clear off our desks in order to make room for the next onslaught'. (Murray, 1997:144) <http://www.jacaranda.org/frasca/thesis/representation.html>. While her analogy *may* hold some truth, it does little to explain the game, its pleasures, or why it works and why it is so popular and addictive. In other words, Murray's analysis says little about the mechanics of the game itself.

games quite obviously function at a structural level (the level of code and machine logic) and as such, seem suited to either of the above approaches, by conducting such analysis, we are not taking into account the fundamental premise of games as *systems* which players gain certain *pleasures* from. In other words, I will argue throughout this chapter that rather than discuss *what* games mean – quite literally an area amply covered by game theory – we can instead consider *how* games create meanings. In this sense, I will ask *how* meaning is made through a discussion of what the games mean to the people who invest so much time playing them. My approach is therefore to examine a series of games – drawing from both narratological and ludological modes of study – although my analysis will be framed within the sphere of *affect* theory. I will argue that theories on affect will open out some of the ways in which games are thought about and understood at player level.

Understanding Gaming: Affect and Intensity

> 'This present of the world or material signifier comes before the subject with *heightened intensity, bearing a mysterious charge of affect*, here described in the negative terms of anxiety and loss of reality, but which one could just as well imagine in the positive terms of euphoria, a high, an intoxicatory or hallucinogenic intensity' (Jameson, 1991:27-8; *my emphasis*).

Jameson's argument frames postmodern society as a force without solid foundations. He describes a new depthlessness within it – caused by continually referencing simulacra; each simulacrum shifting yet further from recognisable historical periods or structures: an erosion – or fragmentation – of history. He sees the present through an explosion of referentiality, causing both negative anxiety and positive intensity. This intensity of 'surface' has dripped down into all forms of popular culture, where television programmes question the origins of existence, as in *The X Files* (Fox Entertainment), or within exploratory game-spaces where decisions made by the user effect the way the game runs, as in *Black and White* (Lionhead, 2001). I will return to Jameson's comments shortly.

Conversely, what games, such as *Black and White* and *The Sims* (Electronic Arts, 2000) both offer are in-built components for the automatic creation of related elements: artefacts which materialise outside the games themselves: both games, for example, contain code which outputs the game's current state into representative web pages[8]. Both games involve the user watching character evolution; in *Black and White*, 'you' – the 'god' or player – are continually invited to make moral decisions to better 'your' own position, to create villages which have the adequate resources to serve 'you' through prayer whilst also sustaining (micro-managing)[9] themselves or being micro-managed by the player. For the player, too much micro-management can be detrimental to the village; they can quickly become dependent on a player who

[8] For *The Sims, See:* <http://thesimsonline.ea.com/home.html> and <http://www.cdmag.com/Home/home.html?article=/articles/020/140/willw_interview.html>; for *Black and White, see:* <http://main.bwgame.com//game.shtml?userid=64bc14a408438b55b43f109ec32fa2c9>

[9] Micro-management literally means making decisions on part of the villagers; as a god, the player can decide how to best manage their villagers. Within the game, to develop a village, its members can be assigned 'disciple' roles, such as farmer, breeder, hunter / fisher, builder, wood collector etc. For a detailed discussion of micro management, *see*: <http://www.wischik.com/lu/senses/bwhints.html>

consistently provides 'miraculous' food or supplies for their village. A similar mechanism functions within *The Sims*; author Will Wright designed the game with an option called 'free will'; this is described in the options portion of the game:

> 'Free will refers to the Sims' ability to live their lives by themselves without your help. If they have free will they will usually respond to your commands, but if you leave them alone for a while they will start to do things on their own. If you are a control freak and would like them to wait patiently for your every order, turn off this feature'.

Both games invite the player to control the characters and events within the game, yet these characters are coded with the ability to fend for themselves: to trigger events without user intervention. Also, as both games function to automatically record and log player progress, both articulate spaces for the internal creation of epiphenomena: an 'adjacent territory (…) a socially meaningful network of relations that enter the arena of reception around it' (Klinger, 1989:5). As Klinger considers epiphenomena – largely in relation to products which circulate around the discourse created by films – we notice the difference where both games are concerned, as by virtue of their own interactive mechanisms (and the use of Internet-based technologies), they create code which maps the player's specific journey through the text. This aspect of the games I will examine in relation to theories on affect later in this chapter. So both games ship with in-built tools, which publish code *outside* the game, which create artefacts which dilate the scope of the text; in *The Sims* the software creates an online photo album, comprising key moments of player development and in *Black and White*, the player has to nurture and train a creature. As the creature develops and learns, it's knowledge and personal development are generated in HTML form. In essence, then, both games align themselves with the Internet by using it as a tool to encourage players to build profiles and hence, form – to some degree – affective communities around the game. I will return to this aspect of both games when I discuss affect in relation to gaming later.

In a sense, ownership of such games equals both the membership of an online community and the ownership of a media creation tool where a software template lays the foundations for community-based content, which extends outside the parameters of the game as a bought 'product'. Games like *The Sims* and *Black and White*, are automatically empowered to author and publish code, creating external web resources, which further publicises the game. In an interview given by Will Wright, lead programmer on *The Sims*, he explains that he regards the game as a tool for narrative storytelling with users sharing stories, annotated photograph albums and objects they have created for the game[10]. At the 2001 Game Developers Conference, he stated that:

> '[T]he online community is probably half the experience of *The Sims* (…) A lot of people play the game, and for a while they really get into it, they enjoy it, but at some point they flip over into this community mode where they start talking to other people about strategies or they start creating stuff and putting it on the website. Other people download that and create something even more out of it.'[11]

[10] *See:* <http://thesims.ea.com/us/exchange/index_families.php>
[11] *Source:* <http://www.gamasutra.com/features/20010501/wright_01.htm>

Perhaps this represents a closer shift to Jameson's notion of *depthlessness*: an economy and 'culture of the image or the simulacrum' (1991:6), where game players who own fast enough machines[12] can dually become owners of characters and game assets[13]; the faster the machine, the more games it can run. Purchase of more games entitles membership to more online communities. Of course, the other key element in this relationship lies in the player's time: success at a game and contributions within communities require investments in terms of time; I will discuss this aspect in the following chapter when I examine the implications of the growth of online Massively Multiplayer Online Role Play Games (MMORPGs) such as everquest[14] and the economic exchanges such games create within the 'public' space the game creates.

So how do such games draw upon notions of *intensity*? Jameson has suggested that intensities constitute 'a whole new type of emotional ground tone' (1991:6). Our feelings, Jameson argues, 'are now free-floating and impersonal and tend to be dominated by a peculiar kind of euphoria, (…) our cultural languages, are today dominated by categories of space rather than by categories of time, as in the preceding period of high modernism' (*Ibid.*16). Intensity, literally, is a means of measuring a body's vulnerability to power; Jameson registers this in technocratic terms: 'dead human labor stored up in our machinery' (*Ibid.*35); yet he also considers this rise in intensity – or euphoria - as concurrent with new ways of thinking about the body 'the representation of space itself has come to be felt as incompatible with the representation of the body' (*Ibid.*34). His suggestion is that the newer cultural experience is found through closer contact with simulacra, in a state where '[t]he world thereby momentarily loses its depth and threatens to become a glossy skin, a stereoscopic illusion, a rush of filmic images without density' (1991:34).

It is through this exploration of intensity of surface - or skin - that Jameson begins to analyse dilapidated parts of the city in relation to the objects surrounding them: the fabric of the city itself may be disintegrating, but the surface simulacrum seen everywhere create a division: such 'urban squalor can be a delight to the eyes when expressed in commodification, and how an unparalleled quantum leap in the alienation of daily life in the city can now be experienced in the form of a strange new hallucinatory exhibition' (Jameson, 1991:33). One key concept we can consider in relation to his thinking can be expressed, I think, through his remarks on packaging: commercial culture, he argues, is now formed around packaging: from advertising to products and into buildings – and, as I will suggest, perhaps also game spaces.

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[12]A recent survey on the Electronic Arts Games website recently conducted a straw poll asking users to tell them the speed of their PCs. *See:* <http://www.ea.com/eagames/main/ps2/sims/home.jsp>

[13] Kate O'Riorden (2001) discusses the ways in which fans of the popular *Tomb Raider* series, talk about Lara: they embody the 'I' tense when they talk about playing the game, taking on Lara's persona.

[14] For example, recent research has demonstrated that Sony's *Everquest* has generated a virtual 'country': Norrath which – it has been suggested – is the 77th richest economy in the world; trading within virtual internal markets, coupled with exchanges made through auctions and online trading systems, has created a 'country' with a gross per capita of $2,266 – more than China or India – it is placed in between Russia and Bulgaria *See:* <http://news.bbc.co.uk/1/hi/sci/tech/1899420.stm>.

Computer games are packaged in a twofold manner: as commercial products they are boxed and advertised through other forms of media, but they also package *spaces*. Let us take, for example, *Midtown Madness 2* (Microsoft, 2000), or *Grand Theft Auto 2* (DMA Design, 2000); both work on the level of advertising to celebrate a no-holds barred exploration of city spaces and wreaking havoc in them. It's a space you know: but there are suddenly no social rules: '[t]ear across Hyde Park (…) or dash your car into the tube for a quick short cut'[15] or even 'London has hundreds of great attractions and many famous sites (…) London is a happy place, which has no time for criminals or wastrels!!'[16]. Although not all spaces replicate space, others synthesise fictional cities: 'Liberty City, USA (…) You'll have to rob, steal and kill just to stay out of serious trouble. Anything can happen out here'[17].

The popular *Grand Theft Auto* series, of which *GTA III* (Rockstar, 2001)[18] is the most recent, is renowned for its packaging of urban space for the sake of both interactive story – where the game is structured through sets of missions – to chaotic and lawless exploration: either engage in a story or beat people up and cause mayhem: the space of *GTA 3* is David Harvey's labyrinthine city: the one which 'invites you to remake it, to consolidate it into a shape you can live in' (1990:5); it is the packaging of a fictitious urban space – Liberty City, USA – which allows for creative play; perhaps this is the game's most appealing aspect. The other aspect – found predominately within many PC based games – involving a different form of 'packaging', invites hackers to remake parts of the game. I will be exploring other examples of this form shortly, but fan-based websites are often set up in advance of the games actual release: often from early stages of testing. These fan sites initially function to collate and disseminate as much information as possible regarding news on programming progress, discuss 'bugs' and flaws which may be found within early versions of code and – after commercial release – create tools and describe methods for taking the game apart to customise gameplay. Such methods could be joint ventures to code authoring tools to enable level modification; adding new graphics to the game; changing the 3D models of characters, weapons and objects, altering the physical properties (the physical laws) of the game and – as I shall discuss in more detail in the next chapter – the development of customised modifications (mods) for multiplayer scenarios.

In terms of the *packaging* of 'urban squalor', then, we can look towards the flow of games, which emulate (to an extent) dilapidated spaces. Where the postmodern, *alienated* space manifests itself in the physical sense, as Jameson describes: one where 'people are unable to map (in their own minds) either their own positions or the urban totality in which they find themselves' (1991: 51), such spaces are dually emulated in both cinema and games. Successful game adaptations of films with 'dark' mise-en-scenes portraying New York subways, the dark streets of Los Angeles and the like, are common themes exploited by games. For example, *Blade Runner* (Westwood, 1997)[19] was translated visually into a game with a seemingly high degree

[15] *Source:* <http://www.microsoft.com/games/midtown2/features.asp>
[16] *Source:* <http://www.gta-london.com/public/visit/visit.html>
[17] *Source:* <http://www.mobygames.com/game/adblurb/gameId,5189/>
[18] *See:* <http://www.rockstargames.com/grandtheftauto3/>
[19] *See:* <http://westwood.ea.com/games/bladerunner/index.html>

of success[20]; *Max Payne* (God Games *et al.* 2001) depicts a linear narrative game strictly resembling a classic Hollywood plot: a police detective has his wife and children murdered and by resolution takes to the streets and dark subways, the 'gritty bowels'[21] of New York armed and ready to take vengeance. On the other hand, the game's mise-en-screen closely resembles both iconography and mise-en-scene within *The Matrix* (Wachowski Bros. 1999). This notion also works in the opposite direction: from Hollywood adaptations of *Lara Croft: Tomb Raider* (Paramount, 2001) to *Resident Evil* (Sony, 2002) to the use of the engines underlying popular gaming software – such as id's *Doom* 3D engine – and just about anything else that is available – to create 'digital' home movies[22]. If a game engine can be used to create 3D narrative sequences, then it can be used to digitally render 'movies' without film.

In relation to games, I suggest that players enjoy the possibility of 'play' within a range of different environments. On the one hand, Soho Studio's *The Getaway* (2002), closely maps the entirety of *Zone One* of London, including the same road structure and much of its more important architecture. On the other hand, a game environment (or space) could consist of a layering of disparate symbols and game elements into a spatial bricolage (Lyotard, 1979), which has no regard for physical (or historical) contingency. Such a space could contain an eclectic mix of visual references and cues, taken from a range of cultures, locations and periods in history. Indeed, throughout the *Tomb Raider* series (Eidos, 1986), Lara moves through different previously defined 'zones', which bear no resemblance to historical, or real space and time[23]. Although we recognise iconography in both an interior and exterior sense: scenes move from Aztec to Egyptian through to a scene of a London Wharf almost seamlessly. Such transitional breaks are common throughout the history of games: Car racing games often function to recreate accurate representations of cities or race tracks, which function to signify real space as *realistically* as possible, to a point where a player – without having ever visited such a space – would *theoretically* be able to navigate it in reality[24]. The break between spaces is necessitated in largely the same way that codes of cinema allow for: editing. A game can construct geographic zones without reinforcing reasons for doing so. As a rule, then, such games essentially demonstrate the embodiment of a progression found within the technology itself: early forms of computer storage were linear, so a database set (for

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[20] Although in consideration of reviews, we realise that games and films are different. The review here seems comparable to comments made upon the popular game *Myst* (Cyan, 1993): 'because of the emphasis on narrative at the expense of player-determined action. "Blade Runner" isn't so much a game, really, as it is an ingenious demonstration of the possibilities of hypertext multimedia fiction' *Source:* <http://www.salon.com/21st/reviews/1998/01/19review.html>

[21] *See:* <http://www.rockstargames.com/maxpayne/main.html> and <http://www.3drealms.com/max/> for a detailed plot description.

[22] *See:* <http://www.machinima.com/displayarticle2.php?article=302>

[23] All quotes taken from Eidos's website: '16 original levels encompassing four continents'; 'the plot un-folds sending Lara to the far off locations of Venice, Tibet and a sunken ship in search of clues'; 'From the jungles of India to the icy wastes of Antarctica, across the roof-tops of London and into the depths of Nevada's mysterious Area 51'; '… takes her from a Scottish castle's subterranean laboratory to the Paris Catacombs' <http://www.eidosinteractive.co.uk/games/info.html>

[24] Here Stephen Poole (2000:227) offers an insight into the process that created the spaces found in Sega software's *Metropolis Street Racer*, where the game synthesises 'information from streetmaps (…) photographs and (…) video' allowing for a game to create a faithful recreation of a 'real' space.

example) would be stored as sequential records on tape. These records, due to the medium upon which they are stored, are accessed one after another from a tape. Later developments – such as disc access – allowed for more dynamic retrieval: all contents are arranged on a disc with an *index* record containing pointers relating to where the file begins and ends. These records can be read off in *any given sequence* due to the nature of the storage medium. So games are *dynamic* systems; they part from narratology when they play through stories: stories can move forwards and backwards; the player is invited to 'activate' story sequences at differing times thoughout gameplay, rather than to watch narrative events unfold within a uniform sequence.

Affect Theory: Accounting for Player Involvement

> '[A]ffect is central to an understanding of our information and image-based capitalist culture (…) our condition is defined by a surfeit of it' (Massumi, 1995:88).

Jameson's (1991) work has implied a 'waning of affect' taking place, although curiously, he mentions intensities as bearing a 'mysterious charge' of affect. His work has re-engaged with theories on affect, which has in turn prompted a discussion between several academics, notably Larry Grossberg (1992) and Brian Massumi (1995). Massumi, at outset, acknowledges Jameson's work as raising affect as a core theme within cultural studies, although he and Grossberg share the belief that 'affect has become more pervasive than having waned' (*Ibid.*107fn1). In order to better understand their argument, we need to consider the interplay between affect (emotional response) and intensity (strength of effect). If intensity can be called to account for forms of immersion found within games, then affect can perhaps explain how people *derive* meaning from games; the ways in which human emotion is expressed surrounding the analysis of games.

Affect is found within any experience involving ranges of human emotion[25]. Psychologist Sylvan Tomkins considers *affects* in relation to physical responses – particularly facial expressions in response to stimuli[26]. The study of facial expressions could provide a useful means for the study of gaming, as humans respond to games in a physical way, often frowning or grinning, depending on their progress within the game. In spite of this, most games require little physical exertion from the gamer, although there is no doubt that there is a degree of hold, or *immersion*, that the player is likely to find themselves under; in many cases, movement and gestures involve *reacting to* what the game *does* to them (or: how the game plays them), in a physical way. For example, I have often observed people leaning from one side to another when controlling a car, or a motorbike, within a game. It is also not uncommon for players of *first person shooters*, such as id's *Doom*, to react by trying to dodge oncoming bullets within the game.

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[25] *See:* <http://www.psybox.com/web_dictionary/affect.htm>

[26] Tomkins breaks these down into three categories: positive, neutral and negative effects. Out of a group of nine affects, two are positive; one is neutral; and three are negative. All emotions can vary in intensity. *See:* <http://www.affectivetherapy.co.uk/Tomkins_Affect.htm>;

The notion of movement through immersion *really* comes into play when we consider immersive hardware, such as Logitech's *iFeel* mouse, or Microsoft's *Sidewinder* Joystick[27]; the hardware is designed to feedback at certain points within certain games. However, such an exploration of affective (physical) response lies out of the remit of this piece, as my intention is to expand upon Grossberg and Massumi's theories and to consider how *affective* relationships are built between players and games. As I have mentioned before, my analysis will draw upon how players expand the gaming experience through their collation of information, advice, editing tools, downloadable levels and scenarios. Before I lead into exemplary case studies, however, I think it would be useful to examine and begin to unpack some of the ideas surrounding this type of analytical study.

Popular culture, Larry Grossberg has suggested, falls 'at the intersection of the body and emotions' (1992:79): signification and affect dually govern a given human response to a cultural object. As Grossberg points out: '[i]t is not a question of interpreting a body of texts or tracing out their intertextuality. Rather, the formation has to be read as the articulation of a number of discrete series of events, only some of which are discursive' (*Ibid.*70). The nexus of his argument – formed through an analysis on the phenomenon of rock music – runs like this: popular culture is defined not 'by formal characteristics but by its *articulation within particular formations* and to specific sensibilities' (*Ibid.*79; *my emphasis*). So in his terms, an analysis can be undertaken along two key planes, structural signification (what it *is*), and affect (*how* it means).

Brian Massumi offers some significant suggestions regarding the study of affect. At outset, his analysis covers a series of empirical tests where children were subjected to three versions of a short film; one (the original) without sound and two with voice-overs: one with a factual - or descriptive – commentary, and one with an 'emotive' response to the film content. His study is centred upon the basis of this test and the fact that it failed 'to find much of what it was studying: cognition' (1995:83). The analysis of the tests (which in the reports own terms) argued for the '*primacy of the affective* in image reception' (*Ibid.*84) fuelled his analysis of its failure. He begins by suggesting that such primacy is 'marked by a gap between *content* and *effect*' (*Ibid.*). In other words: the results of the test demonstrated an illogical connection between the 'effect' of the short film and its content: he concludes by stating that there is no correspondence between quality (content) and intensity (effect) (*Ibid.*85). This leads him to state that image reception is multi-levelled; that two autonomous systems: a film and its human response break down any notion of a reading with correlating results. He remarks upon the fact that presently there is an abundance of affect, yet the current cultural vocabulary is inadequate to describe it: 'Language (…) would seem to function differentially in relation to it' (*Ibid.*86).

[27] *See:* <http://www.tweak3d.net/reviews/logitech/ifeel/> for the Logitech mouse; and *see:* <http://it.asia1.com.sg/reviews/joysticks/joy002_19990326.html> for the Sidewinder joystick. Interestingly, this technology has been put to use as a teaching aid for Dynamic Engineering students. *See:* <http://pegasus.me.jhu.edu/~allisono/publications/old/asee00-richard.pdf>

This moves Massumi to an examination of the *event*. Language, he observes, 'doubles the flow of images' (*Ibid.*87) and on the surface, here Massumi's comments seem to allude to Roland Barthes' discussion of photography within *Image Music Text*, where he suggests that textual captions can further anchor the meaning of an image (1977) However, Massumi's event moves outside the realm of structuralism, arguing instead that any 'stable' or anchored structural reading is affected by emotions in the *event* of reading; that event resides over structure:

> 'For structure is the place where nothing ever happens, that explanatory heaven in which all eventual permutations are prefigured in a self-consistent set of invariant generative rules. Nothing is prefigured in the event. It is the collapse of structured distinction into intensity, of rules of paradox' (*Ibid*).

Massumi's notion of 'event' can carry usefully into one way of thinking about how users traverse game-spaces; the event – or the 'expression-*event*', as he describes it – in essence is that which cannot be mapped through structural analysis: the 'expression-*event*', then, concerns itself with emotional responses to texts. As this case study is not an empirical test, I am going to examine such responses through information posted on the Internet in relation to *Black and White*.

Before I do that, I am going to propose that the process of thinking about playing games functions better when thought of in terms of 'events' also: playing through a game works as a kind of systematic-event; as a player engages with a game, they create a unique event as they map a path through the game-space. This process of navigation through bears some resemblance to Michel De Certeau's *Wandersmanner*. In *The Practice of Everyday Life* (1984) De Certeau describes the walkers in the city (the Wandersmanner) as he watches them from above. As the walkers move, each writes a legend onto the city-space, all perpetually narrativising the space. In this sense, he argues that the city has a dual coding: one arises from city planning, another derives from appropriation of the city-space: 'the networks of these moving and intersecting compose a manifold story that has neither author nor spectator' (*Ibid.*94). The key to his argument, then, hinges on the idea that 'practices invent spaces'; the city is consistently defined by its appropriators in an ever-unfolding 'urban text'. So the *Wandersmanner* drives a narrative path through the city as they traverse it.

Although traversing game-space functions differently to traversing a city-space; here players – at specific given points – are driven by set motives and here, any narrative traced has a solid ulterior motive: to progress to the *next* part of the game. Indeed, guide books have been written to help newcomers find their way around cities; the same is true for many games. Authoritative texts exist to enable a gamer to 'get the most' out of a visit to a game-space. Online forums owned by enthusiasts of a particular game will offer help and advice to new adopters of the game (often called 'newbies')[28]. Games – and specifically single player games – concern themselves

[28] The same process occurs for a multitude of other reasons; gaming is by no means exclusive. Another area where forums are widely used and appropriated concern questions which surround programming

with providing 'events' in the form of puzzles, which may consist of a number of stages the player has to progress through before the puzzle is completed. There are many places online where players can go to discuss their evolution – their path – through the game to ask questions, search for answers, or simply talk about their experience in the game: excitement, fear, happiness, disappointment and so on; all the 'expression-*event*' aspects of gaming.

This is where affect articulates a space for measuring player 'experience' within games. I have chosen *Black and White* for a specific reason: part of the game requires the player to nurture – as with tamagotchi's[29] – a creature from young, feeding it and training it to help the player throughout the game. At outset, the creature is dependent on the player to teach it what is 'right' and 'wrong' through reward or punishment. There exists a strong parental aspect to the game; one which also exists within *The Sims* but perhaps with slightly more intensity within *Black and White*. Indeed both games enjoy avid online engagement – *The Sims* has been used as a storytelling tool and thousands of objects (such as clothing, décor, furniture and the like) have been created to allow users to customise their houses. The British company Avatar Me[30] create 3D avatars of users from a series of four photographs (front and back and both side profiles); these avatars can be imported into *The Sims* and some of the *Doom* games, for example, *Quake* (id software, 1996) and *Half Life* (Sierra, 1998) which I will discuss in more detail in the next chapter.

For *Black and White*, the impact of this aspect of the game manifests itself in several extensively researched documents put together by fans of the game. I will discuss two documents here: *Project CREED* (Creature Research and Extended Entity Documentation)[31] and *Black and White Creature Training, Or, Watch What he's Thinking!*[32]. The game has won numerous awards[33] including widespread acknowledgement for its advances in game Artificial Intelligence (AI) programming. The area where attention to AI becomes most apparent, however, lies in the interaction between the player and the creature in terms of 'training'. At the beginning of the game, the player is taken around the controls of the user interface by the two cartoon-style daemons (daimons), which characterise the poles of conscience: good and evil - black and white. The first mission of the game requires a set of tasks: to acquire three gate-stones and 'unlock' the giant gates to the north of the village. On opening the gate, the player is presented with the choice of one of the three creatures: Cow, Ape or Tiger. Other creatures can be acquired at later stages in the game and all creatures differ fundamentally in terms of speed, reaction, strength,

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techniques: 'how do I do ___ using ___ ?' where a specific (and logical) syntactical solution is often required.

[29] Tamagotchi's are virtual pets – from the Japanese 'tamago' (egg) and 'watchi' (watch). Peter Molyneux drew inspiration for *Black and White* from early versions of these toys sold in the UK. *See:* <http://www2.bwgame.com/bw/diary2> *and* <http://www.ea.com.sg/games/black_and_white/>. The evolution and growth of the Tamagotchi culture has also been extensively documented by *Wired magazine*. *See:* <http://www.wired.com/news/technology/0,1282,6229,00.html>

[30] *See:* <http://www.avatar-me.com/>

[31] *See:* <http://www.planetblackandwhite.com/features/articles/reader/0015.shtml>

[32] *See:* <http://www.wischik.com/lu/senses/bwcreature.html>

[33] *See:* <http://www2.bwgame.com/bw/AWARDS>

intelligence, full adult size and the like[34]; some creatures learn quickly, whereas others are naturally stronger. As the 'god' and the guardian within the game, it is up to the player to decide which creature to choose; the daemons offer advice about each of them. At outset, all creatures need to be trained, nurtured and raised by the player, so an early part of the game involves learning basic training techniques, such as the use of 'leashes'[35] to help mould and influence the creature's behaviour. Everything within the creature's mind functions on variables; the creature, much like the landscape of the game – called Eden – begins 'life' as neutral. As the game evolves, everything begins to morph towards how the player interacts within the game. Peter Molyneux exemplified this in an early lecture on the game, it went something like this: as God, you are summoned to help; someone's husband is in the forest and is too ill to get back to the village. You have a series of logical options to choose from: firstly, you can fetch the ailing villager from the forest back to his village where he can recuperate, or you can 'carry' his wife to him and she can help him walk back to the village. On the other hand, if you didn't want to play so nicely, you could find a rock from somewhere and murder the villager's wife. You could then take her corpse to the villager in the forest who will promptly die of shock. Each path taken changes a number of events in the game; these events ultimately 'judge' what kind of person the player is.

The game functions primarily upon two major areas: micromanagement of the villagers and the training of the creature. Managing the village could mean the realisation that they need food; here the player could use their power to generate 'miraculous food' and to place this within the village's store. This wins the player *belief points* within the village and as belief grows, the player gains more 'power' and the ability to cast more miracles. However, the player soon realises that if they keep producing food, two parameters within the game are effected: primarily, belief points given decrease if the same spell is cast several times. More importantly, such gestures – although good – will invariably do little to help the villagers as they begin to expect being 'fed'. The more they expect food, the more they will eat and this subsequently creates a heavy (and ultimately unrealistic) demand for food[36]. However, the villagers within a village that the player has 'won' through impressing can be managed by assigning roles to individual villagers; in terms of food production, then, it is more effective to assign roles such as 'fisherman', 'farmer' and 'shepherd' to them[37]. A well micromanaged village will function to benefit the player (God) by serving them, whilst also looking after themselves and each other.

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[34] According to *bwcenter.com*, there are 26 different creatures within the game. Their research compares 17 of these using a comparative table. *See:* <http://www.bwcenter.com/blackandwhite/creatures.phtml>

[35] There are three leashes: one to focus the creature on learning tasks, spells *etc*. The second is the leash of compassion, to train the creature to behave affectionately towards an 'object'. Thirdly, a leash of aggression can be used to train the creature to regard other objects in a hostile manner.

[36] *See:* <http://www.salon.com/tech/feature/2002/05/06/games_as_speech/index2.html>

[37] As with everything within the game, adding disciples – as with training the creature – becomes a question of delicate balance; too many disciples working to produce food creates a glut of food and too little of everything else. Detailed hints on *sound* micromanagement practice can be found at: <http://www.wischik.com/lu/senses/bwhints.html>

This notion of balance – perhaps unsurprisingly – is similar to the system for caring for the creature. As the creature is constructed purely from AI code, the player learns – or needs to learn – sound techniques for managing *how* they 'think' and behave within the game; as with micromanagement, training the creature requires a degree of healthy balance: this is managed through processes of reward and punishment: if the creature performs a 'good' deed, such as helping the farmers by producing 'miraculous water' within a field, it is the task of the player to decide whether to reward the creature. Simply put, on first obtaining the creature, it has no concept of 'morality' or how elements operate within the game: the player needs to spend time *showing* the creature how things work and what it should or *shouldn't* do: this functions by giving rewards and punishment. These are administered in percentiles of 10 (from 10 to 100). If the player approves of the creatures' actions, they can reward it by petting it; if the creature is seen as 'naughty', it can be smacked. The player has the right – or rather, is able – to beat the creature all the time although too much of this will make the creature fearful and disrespecting to its 'owner'. Consequently, too much petting will have the opposite effect, rendering the creature less useful within the game, if you like: spoilt. As punishment and rewards can be administered within percentiles, the creature 'learns' and 'behaves' through understanding rewards pitched against him; if he receives 100% reward for two actions, then most likely he will repeat both actions regularly; if he receives 20% reward for two actions and 40% for one, there is a 50% chance he will perform the latter task and a 25% chance he will perform the former tasks. Due to the staggering amount the creature can learn – and taking percentiles and other unique factors (such as the tiered alignment between good and evil, weight/height and scarring from fighting), all factors make for what is, in essence, a highly personalised 'helper' throughout the game.

Two online articles, which, I think, tell us a lot about player affect and – if you like – the role of the creature/owner relationships were mentioned previously[38]. A game which places such a strong emphasis on 'nurture' could mean a player literally invests hours 'rearing' their creature, moulding the way it behaves and 'thinks' (in game terms). Creatures grow and age; they gain scars from fighting other creatures, they put on weight if they eat too much and their characters morph depending on their alignment with notions of good or evil[39]. Within the logic of the game, creatures age, although they never die; one list of Frequently Asked Questions (FAQ) compiled by fans of the game explains why; suggesting that at the game development stage:

> '[Game] testers became very emotional when their creatures died. It is very possible to get highly attached to your creature (that is because you only have one), and they are very unique, so a dead creature is irreplaceable'[40].

Indeed, both *The Sims* and *Black and White* feature systems for grievance: within a *Black and White* village, the death of a villager causes others to grieve. Partially game 'grievance time' can be reduced by building grave-yards for the dead. Within a

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[38] *Project CREED* (Creature Research and Extended Entity Documentation) and *Black and White Creature Training, Or, Watch What he's Thinking!* See page 111 (footnotes 31 & 32) for references.

[39] At the time of writing, three concept images created for Black and White Studio's *Black and White 2* can be found online at: <http://www2.bwgame.com/bw2/IMAGES>. These images depict the 'neutral' (default) alignment and the extremes of good and evil alignment.

[40] *Source:* <http://www.planetblackandwhite.com/blackandwhite/faq/>

Sims family, Sims can die. When a Sim dies, friends and families will appear grief-stricken; such systems, Henry Jenkins has suggested, have led to a new currency within gaming: evidence, in his opinion, that the gaming industry is changing and – in a sense, growing up[41]. As AI in gaming improves, emotions will play an increasingly important role; *The Sims* is perhaps the most successful selling game of all time; *Black and White* has also enjoyed a huge degree of success. Both games offer systems essentially for management within the game although both equally address emotion directly as content within the game. The *hold* of such emotional content manifests itself in the way players talk about the game itself. Much of the game's AI is based on concepts drawn from philosophers such as Wittgenstein and Dreyfus[42], so within the game, groups of villagers share a kind of collective (or group) mind in the way they all deal with situations: wonder (at a miracle), grief (at a death), despair (at a tragic event) or the ability to celebrate at other times. On a discussion of the affectual plane of the production of 'pain' within an AI environment, Evans and Lamb cite some basic philosophical tenets:

> 'The concept of pain is characterised by its particular function in our life. Pain has this position in our life, has these connections. (…) The concept of pain is bound up not just with characteristic pain-behaviour in circumstances of injury or illness, but also with pity and commiseration, fear and anxiety, cruelty and mercy'[43].

Here 'pain' is the locus for a complex set of interactions; within AI, pain is understood not as a physical force, but as the result of a web of interrelated events and is meted out according to the context upon which it is sent and received. The closer programmers can get to understanding – or rather, representing – pain in a way which closely emulates the human emotion within a game space, the more the game appears to become a site for affective attachment. Within *Black and White*, understanding the concept of 'pain' both to villagers and to the creature is required to enable the player to better 'use' (and relate to) their creature. It is an underlying logic of sensitivity, then, which dictates the parameters of 'good' practice within the sphere of the game. The documented *Project CREED* explains this implementation at the practical level of the player:

> 'It's possible to turn a creature into a mental wreck if it's exposed to enough punishment and mistreatment. Sometimes trauma caused during its early years can have a lasting effect. If you severely beat a titan who's eating too much when they are young then it may end up never wanting to feed itself later'[44].

Indeed, acknowledgement of the complex network of 'rules' within the game propels the system of training within the game itself: when the creature first comes into being, it seems largely regarded as an empty vessel, ready to be given knowledge, guidance,

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[41] *See:* <http://www.usatoday.com/life/cyber/tech/review/games/2001-08-02-god-games.htm>; although I am primarily drawing from comments Jenkins made at the 2001 Game Cultures conference in Bristol, UK.

[42] Richard Evans, the lead AI programmer behind *Black and White* began as a philosophy student; from there he moved to AI. (*See:* <http://www.gamasutra.com/features/20020424/evans_01.htm>) <http://www.gamasutra.com/features/20020424/evans_01.htm>, Evans and Lamb argue for a branch of AI which owes much to Wittgenstein and Dreyfus's work on human behaviour within social situations.

[43] *Cited in:* <http://www.gamasutra.com/features/20020424/evans_01.htm>

[44] *Source:* <http://www.planetblackandwhite.com/features/articles/reader/0015.shtml#Chap1>

training, and so watches how its master interacts with the game, attempting to emulate that behaviour and thus gain approval:

> 'What he decides to do depends on how ingrained the habit is, how early in life he was punished or rewarded for that habit, how much he watches you and cares about pleasing you (…) [He] will learn by watching. He will watch what you're doing, will try to figure out why you did it, and (if he likes you) will have a go at doing the same thing'[45].

Further advice from the same source reminds the player of the importance of autonomy; as with the 'dependence' held within the village regarding constantly fulfilling 'needs', a clear and practical logic can be applied to good 'parenting' practice; the creature is capable of autonomous thought and as such, the player is reminded that good practice can be achieved by watching and encouraging the creature to develop, sometimes by adopting the role of observer, rather than the master:

> 'You must spend time with your creature. Try letting him choose what to do for a day (of game time), only watching and punishing or rewarding. You'll see him feed himself. With time and practice you'll get him eating only when he is above 80% hunger. Do the same for his drinking and sleeping'[46].

Elements of taste are also encompassed within the game: to many, a creature can exist on a diet of meat, fish and grain; within the game, however, the creature can exist on one and still function[47], such aspects and decisions can be encouraged within the process of training. The network of 'taste' events also translates to music: part of the AI will allow the creature to learn to dance; he can learn dance techniques both from watching the villages celebrate and from meeting other creatures and dancing with them. An early addition to the game provided by Lionhead software, allowed integration of the game with the popular *WinAMP* software[48], a shareware audio player; with *WinAMP* active within the game, mp3 files can be played and the creature – if not preoccupied with anything else – will listen and dance in time to the music. A logic of 'taste' in music can be prescribed through the system of rewards and punishment in relation to the particular piece of music being played at any given time; the fan site 'Planet Black and White' explains this process in their FAQ on the game:

> 'You can discipline them about music too. For example, you can slap them about if they dance to the *Spice Girls* or praise your creature if he starts head banging to *Metallica*. Eventually your creature will figure out what you like, and behave accordingly such as covering his ears when the *Back Street Boys* come on, or getting out his air guitar when it's *Nirvana*'[49].

This process (of aligning certain music with 'good and bad') is tantamount to creating what Larry Grossberg calls 'mattering maps': systems where structures of

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[45] *Source:* <http://www.wischik.com/lu/senses/bwcreature.html>
[46] *Source:* <http://www.wischik.com/lu/senses/bwcreature.html>
[47] Naturally, different foodstuffs have different properties: eating meat, for example, would be more likely to make a creature put on weight than a grain-only diet.
[48] *See:* <http://www.winamp.com>
[49] *Source:* <http://www.planetblackandwhite.com/blackandwhite/faq/>

feeling are understood through the forging of identities (or subcultures) by grouping a series of cultural objects, such as pieces of music, together. I've often noticed students write the names of bands they are interested in on their bags. Such a practice creates a mattering map which is displayed wherever they are; literally, elements of their own cultural identity are 'displayed' and carried. An excellent commercial example of 'mattering maps' can be found on *Amazon's* website, where products and related items are linked together and a forum is put in place for people to talk about the products. However, what is interesting within this development is that taste and values from popular culture are 'mapped' into a game; the user can 'train' their creature to behave accordingly when different samples of music are played. By allowing the addition of what is an undeniably personal set of laws (in this instance, governing emulating how people relate to and make meaning from music), player identity and decisions and 'mattering maps' can become mapped electronically. The 'creature', then is able to learn from sources outside the game: objects from within the sphere of popular culture. This remains the only example I can find of a game which allows external (extra diegetic) factors, such as music, to affect how objects within a game can be recoded; I will reconsider this point in the next chapter.

Of course, it would be easy to dismiss what I've just said as nothing special: to suggest that the AI is 'not really clever' because the creature doesn't really have a taste of its own – not at present, at least – it could be rightly argued that formations aren't made as they are in the real world: there could be a million reasons (memories, emotions etc) as to why a piece of music *matters* to someone; all the creature can do is respond in a coded and logical sense and, Grossberg would agree, music and mattering *isn't* about that. However, I think that game AI should be considered not solely on the level of how 'clever' the creature can be, but more on how the creature's 'intelligence' gives life to a wider portion of a game; *Black and White* indicates a strong starting point for this by opening the tamagotchi principle into a full-colour immersive game and what is clear and obvious at the moment is that todays games demonstrate what would be considered as 'basic' AI within five years time: new innovations set precedents to be outmoded. Within gaming, this seems to be happening extremely quickly.

Chapter 7. Team Play: Hyperplay, Mods and Customisation

In the previous chapter I discussed two games, both largely considered as 'single player' games; I suggested that thinking about them along the lines of affect could be a useful inroad into understanding *how* people play games and by doing so, it became apparent that the games themselves spawn their own cultural values, which become evident in the amount of resources created and produced online as autonomous parts of the game. With both *The Sims* and *Black and White*, it became obvious from how people spoke about the games that real pleasures – and emotionally engaging relationships – occurred within the game-spaces themselves and within the online communities which further mould and channel the game. It became clear that both games mattered to people and – in some respects – both games were potential candidates for the recruitment of new players into the sphere of gaming, as both quotes might suggest:

> 'The Sims is not as much about human relationships as it is about life administration. While the game deals with pleasing your friends or cheating on your partner with your neighbour, the main activities remain managing money, unclogging toilets and doing a lot of cleaning'[50].

> 'Whether you wanted a creature that babysat your villagers and jumped to their every need, or a creature which took over villages and struck fear into all who opposed him, or even a creature which could kick the living daylights out of all bar none, all these possibilities were achievable. The height of gaming artificial intelligence creatures will always hold a special place in many people's hearts'[51].

The Sims and *Black and White* both offer coded systems for the creation of player pleasures. The mass of online resources for players of either of these games is phenomenal; from new clothes, cars and household goods in *The Sims*, to creature training programmes in *Black and White*. Yet both games are in some respects, tools for creating stories; players gain pleasures from using and adapting these games to create objects which say something about them. In *Black and White*, this revolves around making a creature 'behave' and 'think' the way the player wants them to – or at least, near to that. *The Sims* offers the pleasure of managing a house, a family, relationships, domestic chores, friendships, capital, jobs, status symbols and the like. Unsurprisingly, what happened with *The Sims* was that people started designing objects which were more personal to them, from items of clothing to cars to furniture; such customisation, and the facility for captioned (virtual) photo-albums meant people used the software to tell stories, much to the delight of lead programmer, Will Wright[52]. Although these communities offer something that I find fascinating – a kind of cultural currency within which gaming can be viewed, there is also another vastly popular area of gaming being explored – and customised – night and day by thousands of people: online multiplayer games.

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[50] *Source:* <http://www.gamestudies.org/0101/frasca/>
[51] *Source:* <http://www.planetblackandwhite.com/features/articles/staff/blackandmagnetic.shtml>
[52] At the 2001 Game Developers Conference, Will Wright – talking about the online community surrounding *The Sims* – staked his own satisfaction in: 'that a player had used this medium to tell their story, and share it with others' <http://www.gamasutra.com/features/20010323/byrd_01.htm>

What I want to talk about now lies largely in an historical trajectory that really began about 9 years ago with *Doom* (id Software, 1993). I have already mentioned this game briefly, but my intention now is to consider the evolution of what is probably (alongside the virtual cult of personality that is Lara Croft) the most epitomised iconography to exist anywhere within the sphere of gaming. The *Doom* games, I think, matter in a very different way to people – largely by nature of their compelling game *interface* but also by the fact that they demonstrated what networked 'team-games' could consist of: a factor which cannot be denied is the overarching popularity of *Doom*-style games played over the Internet at any given time.

The History of the Doom Space

As I suggested in Chapter 5, part of the early history of the *Doom* game revolved around its architecture and it's ability to create a mise-en-screen for literally any game situation: as the engine for a versatile 3D navigable space, graphics could be mapped onto walls and spaces could be created to represent anything from alien spaces (*Half Life*, Sierra, 1998) to space-ships (*Alien vs. Predator*, Activision, 1993) to the subways of Los Angeles (*Soldier of Fortune*, Loki Games, 2000) and the spaces of the recently expanded *Star Wars* trilogy (*Jedi Knight*, LucasArts, 1995); it was a perfect game engine for creating a specific scenario for a game and hence, several elements of classic film iconography – such as the examples above – were whisked in and packaged into full-price games which sold in droves.

The success of early *Doom*-style games relied upon the fact that they sold both a playable space and a hyper-playable space, where computers could be linked together through the creation of game servers allowing several players to simultaneously work within the parameters of a networked game; the game space of *Doom* would then become one where competition could be encouraged between people through the creation of small Local Area Networks (LANs), Internet-based networks, or both. Programmer John Carmack's idea to incorporate network-enabled play into the design of the game engine looked at outset like it would boost the popularity of an already successful formula (*Wolfenstein 3D*, id software, 1992), indeed, id Software's John Romero had claimed that on realising the capacity for network play that *Doom* 'was going to be the most badass game in the history of the planet Earth'[53]. In a sense, Romero's insightful comment wasn't that far from the truth: the original game sold two and a half million copies, alongside the downloading of an estimated seventy million shareware versions[54]; later versions would cumulatively sell tens of millions of copies over different platforms.

As Darley (2000) has suggested, the original *Doom* has a minimal plot; in essence, the plot revolves around shooting anything that moves, finding keys and getting out of the level alive (*see also:* Aarseth, 1999). At outset, the game engine was what proved extremely popular to players. Later games began to add extra flavour to the game, one of the biggest turning points for me emerged within the game *Half-Life* (Sierra, 1999) where, in the end, while the process of killing (or 'fragging') monsters

[53] *Source:* <http://doomworld.com/pageofdoom/thegame/doomhist.html>
[54] <http://www.sfgate.com/hypertek/9708/4_quake.shtml>

remained paramount to the core functionality of the game, coded AI began to seep in to allow slightly more interaction and potential for plot than before. Of course, the main objective was to cover the game-space with alien blood and entrails using an assortment of cartoon-style weapons, but this factor has always been one of the propositions upon which *Doom* games have been based. The game architecture initially formulated for *Doom* now seems to have taken on a life of its own – and appears set to stay for the immediate future. Soon, Epic Games' *Unreal Tournament 2003*[55] and id's *Doom III*[56] will be released, both vying to offer the most comprehensive gaming environments available for 3D first-person-shooter (fps) games.

Gaming Environments / Gaming Engines

What is fascinating about both *Doom* (id software, 1993) and later, *Unreal Tournament* (Epic Megagames, 1999) (although both are remarkably similar games), lie in the technology that executes and renders the game: the game engines. Both Epic Games and id Software create and *license* the technology underpinning their games. The technology used for the original *Doom* game – now dramatically altered from the original – has been the basis upon which many other games have been built. id Sofware currently sells licences for the *Quake III* (id software, 1999) engine to both game developers and manufactures of graphic-card technologies and some of their revenue comes from licensing out their technology for other commercial ventures, such as *Half-Life* (Sierra, 1999), *Jedi Knight II: Jedi Outcast* (LucasArts, 2002) and *American McGee's Alice* (Electronic Arts, 2000)[57]. Epic Games, on the other hand, have licensed their 3D game technology to Industrial Light & Magic (ILM) for their creation of 3D walkthroughs of set designs[58] for *Artificial Intelligence* (Warner Bros, 2001) and the games *Deus Ex* (Ion Storm, 2000) and *Clive Barker's Undying* (Electronic Arts, 2001).

Recently, id software released on General Public License[59] all of the code for both the *Quake* (id software, 1996) and *Quake II* engines (id software, 1997); the technology underpinning both games has been made freely available for download on agreement to the terms set out by the GPL licensing agreement. Understandably, this has led to a number of bizarre spin-offs, namely the 'machinima' movement[60], a forum and support site / repository for 'movies' made using the *Quake* technologies, *AAQuake*: a purely text-rendered game based on the GPL'd *Quake II* engine and *Red-Blue Quake*: a version optimised for 3D glasses[61]. Additionally, the release of the GPL licence has further aided the development of countless 'mods' created to alter the way the game functions, for example, by employing similar forms of physics and mise-en-scene found within the film *The Matrix*[62].

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[55] *See:* <http://www.unrealtournament2003.com/>
[56] *See:* <http://www.gamespy.com/e32002/pc/doom3/>
[57] *See:* <http://www.idsoftware.com/business/home/technology/>
[58] *See:* <http://www.filmandvideomagazine.com/2001/07_jul/features/A.I/unrealcity.htm>
[59] *See:* <http://www.fsf.org/copyleft/gpl.html>
[60] *See:* <http://www.machinima.com>
[61] *See:* <http://www.jfedor.org/aaquake2/> and <http://www.jfedor.org/red-blue-quake2/>
[62] *See:* <http://www.planetquake.com/kickme/matrix>

Communities of *Doom*: Making Gaming Mods

Ever since *Doom* was first released and brought many servers in American universities down (*See:* Herz, 1997), the relationships fostered between the game and its online enthusiasts has been staggering. id software harbours a proven track-record for success within this area for two reasons: firstly by offering support to gamers by giving them access to the tools they developed for the creation of levels, avatars (characters or 'skins') and modifications and secondly, by adhering to the principles of shareware in the first place; essentially, by giving away one-third of the game for free could constitute 'giving the game away', but their philosophy and approach has worked: it is almost beyond doubt that *Doom* would never have enjoyed the success and exposure it has received without doing so and also, id's GPL approach and the free distribution of tools has led to a life which stretches way outside the boundaries of the boxed commercial release. The game's style has become a genre in its own right spawning many *clone* games, some of which I have already mentioned; but some of the biggest – and probably most unexpected – results have stemmed from the creation of a versatile 3D engine which has enabled the creation of an almost infinite range of fantasy mise-en-scenes, in addition to a means for making 'home movies' using the technology. Finally, the network elements coded into the game have allowed for gaming to be undertaken either over a local area (LAN) network or the Internet.

This area of appeal explains why thousands of users worldwide meet in 3D game-spaces online and was undoubtedly a deciding factor for its adoption by the (post-cold war) US Marines as a team-strategy training simulator: *Marine Doom*[63]. Back in 1995, two members of the US Marines, having played many different games, decided that *Doom II* – although a far more simplistic game than many available now – could, with some careful adaptation, be used to simulate situations which would promote team co-operation, quick thinking and practice methods for combat. They spent three months editing the game to create a customised space and added the weapons they used to create a scenario that shifted closer to being able to envisage using the technology as a training mechanism. Insanely enough, this experiment caught on, also catching the attention of the Secret Service, FBI, US Army (*Ibid.*). Also – and perhaps unsurprisingly, it became suddenly apparent that the game could also be used as a marketing tool to provoke interest from potential candidates:

> 'Kids who join the marines today grew up with TV, videogames, and computers. So we thought, how can we educate them, how can we engage them and make them want to learn? This is perfect'[64].

Although this VR process isn't necessarily new: in *Inventing the Future at MIT*, Stuart Brand mentions the use of 3D VR recreations of a mission which was used to train soldiers for a mission (Brand, 1997), what is perhaps new is that the initial *Marine Doom* remake has recently led to a considerably more lavish and expensive set of games: *America's Army: Soldiers* and *America's Army: Operations* (US Army,

[63] *See:* <http://www.wired.com/wired/archive/5.04/ff_doom_pr.html> *See also:* Jordan (1999:189-90).
[64] *Source:* <http://www.wired.com/wired/archive/5.04/ff_doom_pr.html>

2002), which – as it happens – has been developed as a $7m 'recruitment and marketing tool' to educate and inform people about *what* the US Army do[65]. The game is based on the Epic Games' latest *Unreal* engine and has been held up as the most comprehensive and realistic US army game: 'weapons can (and will) jam and fail, with each weapon having a unique different fail percentage'[66]. As a game, it gained notoriety at the E3 2002 conference: a freely downloadable[67] product of the standard reached by many full-price commercial releases, with 600,000 players registering within the first 50 days of release. Additional extras are being added, with an 'Airbourne Ranger' patch and extra 'teamplay' (online) games being made available. Whether the game drives recruitment may still be open to debate, although the game has already created heavy demands, being downloaded both from within and outside the USA.

Half-Life: Counter Strike and Unreal Tournament: Tactical Ops

Perhaps one of the *other* driving forces behind *America's Army* lie in a desire for games that pursue a higher degree of realism from their predecessors. Two examples of such games are *Half-Life: Counter Strike*[68] and *Tactical Ops: Assault on Terror*[69]. One of the main doctrines of both games centred around the creation of a game which serves to make game-play 'a little more realistic': classically, early multiplayer FPS games functioned around running and shooting, scavenging extra weapons as the player goes. When the player 'dies', they 'respawn' (or re-enter the game-space) from another point: from there, they can continue to run and shoot until they get bored. Throughout the game, the server is responsible for calculating the game statistics.

This was fun for a while, although through time and the widely available development tools, more complex and innovative games were developed, some of these ultimately becoming incorporated into the games as 'modes' of play. One such example is the popular 'capture the flag': an early player modification which soon became a standard feature within FPS games. Quite simply, the 'capture the flag' game functions like a rugby game: only there are two flags. Each team must try to 'capture' the others flag and place it next to their own in order to score a capture point. This style of 'mod' became developed further into a game called *Team Fortress*[70] and is also a multiplayer mode found within *Quake III Arena* (id software, 1999).

Another 'mod' which really had a dramatic impact was the release of *Half Life: Counter Strike* (Sierra, 2000). Initially a 'mod' created by game enthusiasts, as the game progressed through early stages and the code was refined, the game quickly

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[65] *Source:* <http://money.cnn.com/2002/05/31/commentary/game_over/column_gaming/index.htm>
[66] *Source:* <http://www.gamespy.com/e32002/pc/armyops/index2.shtml>
[67] *Go to:* <http://americasarmy.com/ops/downloads/downloads.html>
[68] *See:* <http://www.counter-strike.net/>
[69] *See:* <http://www.tactical-ops.to/index.php?page=about>
[70] *See:* <http://www.planethalflife.com/tfc/> and <http://tfc.sierra.com/>

caught on to become one of the most played game modifications ever seen[71]; so much that the unofficial mod – still free to download for owners of the game – was taken over by the programming house (Sierra), refined further and given an official release. The same is true for the *Tactical Ops* 'mod'; initially hacked together by game enthusiasts and then released commercially by infogrames[72]. Both games (or 'mods') achieved popularity and acclaim through an embodiment of a more realistic style of play; moving away from the dimensions of the science-fiction fantasy of *Ghostbuster*-style guns and monsters to a realm of team strategy where players control a member of a German, American, French or English special force on one side, whereas the other side comprises of terrorists. Those on the 'special forces' have to rescue hostages and kill the terrorists, whereas the terrorists can kill both. Generally speaking, the task is to secure a building (often a warehouse-space) and for once, strategy and stealth supersede endless pointing and shooting; the constant 'respawns' that allow a player to rejoin the arena after their demise is removed from both *Counterstrike* and *Tactical Ops*; in their space, a player's death banishes them to the realm of spectator, a position where they leave their avatar and weapons where they died, now only able to observe the rest of the game until the next match. Since the release of both games, this style of gaming has proven increasingly popular, rendering both 'mods' highly popular on game servers.

As with multiplayer games – far more so than single-player games – one of the emergent problems has occurred around policing *fair play*; indeed the main sites for both 'mods' have rules and guidelines for playing the games. However, human nature is as such that players cheat, so – in the case where many people are playing – systems need to be put in place to minimise unlawful play. Cheating is a source of irritation and many players are vocal about this, often using the talk function within the game to reprimand a player[73]. One effective solution against 'unfair play' is for monitoring to be undertaken by the server. For *Counterstrike*, a general *Half-Life* adminstration tool has been created called 'adminmod'[74], whereas the *Tactical Ops* 'mod' uses a system called TOST (Tactical Ops Server admin Tool)[75]. Another route around this has fallen into the hands of 'clans': players who get to know each other initially through playing, although later through Internet Relay Chat (IRC) software[76]. Generally these are players who 'meet up' and play at specified times as a 'team'; the 'clan' system has become an integral part of multiplayer games and in a sense, they represent a higher, more dedicated hierarchy of players. Clans will play against other clans, further encouraging online competition, although this comes at the cost of 'commitment' to the game to others. After all, gaming requires an investment of player time: as and *when* time is available.

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[71] Indeed, the home page of the official website proudly boasts that 'Counter-Strike is the #1 online action game in the world'. *See:* <http://www.counter-strike.net/>

[72] *See:* <http://us.infogrames.com/games/tacops_pc_action/>

[73] There is also – in addition to 'text-based' chat – a facility which allows for voice-chat (voice over IP). A popular example of this used on some servers is the Roger Wilco software, which – fast connection providing – allows team members to talk and play through headsets. *See:* <http://rogerwilco.gamespy.com/>

[74] *See:* <http://www.adminmod.org/>

[75] *See:* <http://tost.to-center.com/>

[76] *For example:* <http://www.mirc.com/>

Conclusion: Online Entertainment

> By playing the game, the player *codes* the game. As this happens, the game dually *codes* the player

In this final section, I'd like to reflect on some of the ways in which gaming has developed over the past three decades to form the industry we know today. A new dimension has been opened through the co-location of games with online resources: networked technologies allow for team-based games (or *hyperplay*) and every hour of the day, thousands of people are playing across the globe. Both Sony's *Playstation 2* and Microsoft's *XBox* offer products and packages which require a broadband connection to enhance gaming[77]. Additionally, a raft of games, addons and the like are available to ensure an online 'experience'. Indeed, *The Sims Online* (Maxis, 2003) is literally an expanded multiplayer version of the game. The game is only one side of course; hundreds of fan sites also exist, creating interest groups and communities that swap information, ideas, tips and work to expand the game to maximise their own pleasures from the product.

Gradually, as increasing numbers of users switch to digital services, a raft of new services for online entertainment seems inevitable: in recent months, for example, we've seen the launch online music services from Apple (through iTunes) and a merger between BT and Yahoo! offering consumer services and gaming. We've also seen the launch of the slightly controversial *Skype*, which offers peer-to-peer telephony via an internet connection, bypassing the telephone completely. Several interactive entertainment companies have moved over to the creation of Massive Multiplayer Online Role Play Games (MMORPGS). These are subscription based games which players sign-up for and, once logged in, are free to roam around, play, perform and interact from other players.

MMORPGs represent the commercialisation of Multi User Dungeon (MUD) based games first seen emerging from Universities some 20 years ago (*See*: Bassett, 1997). Facilitated by technology, a corporate ethos and a network infrastructure, MMORPGs offer an insight into the way games are potentially heading. As these spaces are owned by companies such as Sony (*Everquest*), I envisage vast games where advertising will surely begin to become part of the spatial furniture. It is also already clear that such games are 'within reach' of Java based mobile phones and pocket PCs[78] meaning the game can be played away from the desk or the living room.

What is perhaps more bizarre here is that these spaces have a currency and value reflected in the world of finance: a glance at eBay, the popular auction trading site, makes clear that such games can sustain a real economy of their own. People are trading tools, characters, tips and artefacts: hours invested in online play can translate into real money. A recent article published by BBCi demonstrates the growth of such

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[77] Microsoft's *Xbox Live* works in conjunction with a broadband connection, such as BT's home ADSL package. *See:* <http://www.xbox.com/en-gb/live/>. Sony's UK Playstation website also offers information concerning online multiplayer gaming. *See:* <http://eu.playstation.com/networkgaming/story.jhtml?storyId=300343_en_GB_GUIDES>

[78] *See:* <http://eqpocket.station.sony.com/> *and* <http://heroscall.station.sony.com/>

economies: in a survey held in March 2002, Norrath, the virtual world of *Everquest*, had entered the world economy (at 77th, between Russia and Bulgaria) primarily through such an economic crossover[79]. As to how far this research can really be believed (since when is virtual money *real*?), what is becoming clear is that interactive entertainment will move ever further to sustaining player interest whilst articulating spaces for new virtual economies.

Formal structures: progress made in understanding design and analysis

> 'Before the appearance of the Formalists, academic research (…) had so lost sight of its proper subject that *its very existence as a science had become illusory*. There was almost no struggle between the Formalists and the Academicians, not because the Formalists had broken in the door (there were no doors), but because we found an open passage-way instead of a fortress' (Boris Eikhenbaum, "The Theory of the 'Formal Method'":105)[80]; *my emphasis*

Now I'd like to run back to where I started from. Formalism and structuralism are means for 'mechanically' (in the academic sense) separating 'form' from 'content'. With them, we have analytical tools which allow us, as critics, to get beneath a narrative text and begin to deconstruct it. In order to better contextualise its importance, I'd like to briefly touch upon *why* it came into existence and *what* it intended to do. Formalism emerged from within communist Russia in the early 1900s and had several 'branches' (including academic theory, art and literature), for example: Futurism and Constructivism, which I shall describe shortly. One of the most remarkable aspects of these movements is that nobody knew anything about them (in Western terms) until decades later as this vast wealth of information was cut from us for many years. Perhaps the most unifying aspect within this node of theory is it was about *abstraction*: creating what we would call a schema for understanding how to break something down and identify its parts *as if it were a machine*. The turn of the 1900s had brought with it a collective drive to escape from history, by doing so, to consider a work of art in isolation from the other forms which surround it.

Here structuralism differs because it considers the context in which a text is produced in relation to a network of signs and codes; Barthes' mode of analysis *does* consider the culture and the history of the text, in a relational sense, but then his work shares one property with formalism in that it was about deconstructing a text and its meaning (or its sense of 'artfulness'). Within Formalism, there were literary academics (or writers) such as Shklovski and Jakobson on the one hand; on the other, there was Kandinsky, who was 'into non-representative or non-figurative abstraction'[81], a precursor to cubism. Futurism, as its name suggests, intended to ignore the past and involved linguistic experimentation[82]. Here attempts were made to create new forms of poetry and literature, exploiting the sound texture of the language. Again, here the key terms which overlap concern themselves with this notion of abstraction and a sense of the *growing importance of the machine*, or the

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[79] *Source:* <http://news.bbc.co.uk/1/hi/sci/tech/1899420.stm>
[80] *Cited in:* <http://www.shef.ac.uk/k-zbinden/history.htm>
[81] *See:* <http://www.ditl.info/art/definition.php?term=1883>
[82] Here I'm considering – or concentrating on – *Russian* Futurism, which is undoubtedly connected with Italian Futurism although their historical relationship lies outside the scope of this thesis.

system. In this respect, a formalist approach to literature attempted not only to isolate and define the 'formal' properties of poetic language (in literature) but also to study the way in which certain 'devices' (for example *ostranenie*) determined the 'literariness' or rather, the 'artfulness' of an object.

Games are formal systems: a pack of cards has a perfect mathematical symmetry from which hundreds of games have derived the world over: a card game can be broken down into finite mathematical systems and rules, the building blocks for games (for what is a game without rules?). Similarly, formalism and structuralism provide rules for deconstructing narrative texts, enabling us to 'use' language to take a text apart. I have demonstrated, the kind of analysis formalism and structuralism will allow for can be used further our understanding of, say, a user interface. Here I am thinking of operating systems: the desktop 'metaphor' is used as a kind of abstract bridge (or layer) between the user and the machine: essentially, to make the operating system 'useable', the software creates chains of signifiers that are of benefit to the user, a visual language which we are all familiar with. Indeed, a 'progress bar' is a formal structure, much like one of Propp's 'agents'. Its narrative purpose in the 'text' of the operating system is to allow users to understand how long a process (usually loading) will take.

Usability 'celebrity' Jakob Nielson clearly respects formal logical structures. Nielson believes that good design 'language' can be understood by taking stock of a series of rules. These rules are really formal structures (much like the desktop 'metaphor') that show the user 'how' the system works. We all know, for example, how a 'left hand nav' (LHN) works. Given that almost every big corporate website across the world has adopted this, we could say that the LHN has become a formal element for an information system within a web page. By its very nature, it structures the page by organising content and also serves as a *tried and tested* means of making content online accessible. There are many 'formal' elements that make information easier to find on a web page, a computer easier to 'use' and a game easier to 'play'. All of these elements, to an extent, adhere to principles we can find within formalism and structuralism.

This leads us to a concept of an overarching 'architecture' which denotes 'good' design, which I shall discuss shortly. I would like to briefly conclude by stating that formalism and structuralism have been useful as starting points as they give us an insight into the kind of academic tools we can use for 'mapping' what a system is: formalism offers a structuring logic for a literary system through a series of techniques - such as *ostranenie* - which allow analysis to take place through a process of abstraction. Structuralism, on the other hand, demonstrates how meaning can be made across a network of objects. In earlier sections, I have mentioned physical architecture and how it reconfigures the space in which we live. I have also mentioned that the architecture of a place can be mapped through forms such as cinema, photography and even games. Now I would like to lead from 'formal' elements within design to thinking about a different kind of 'architecture' which can allow us to think about how games are built and how they work.

Architectures for Information and Design Patterns

Architecture is a system for structuring and ordering physical space. Information architecture is a robust system drawing from computer science, architectural and taxonomic theory to allow us to understand and describe what an information system is. Like formalism and structuralism, it's a discipline for creating an 'abstraction' - much like a blueprint - for how we can think about (and manage) the daily 'flow' of information. It's a discipline which aids in the design of a computer network, a website or a directory. Design patterns offer blueprints for game design or programming - tried and tested rules for solving problems which have occurred in the past. Where Architecture and Information Architecture demonstrate mutual influence, is through 'design patterns'.

The architect Christopher Alexander is widely thought of as the father of 'object oriented design' patterns (*See* Alexander, 1978). A 'pattern' is a recurring solution to a standard problem. When related patterns are woven together they form a 'language' that provides a process for the orderly resolution of architectural design and development problems. Alexander's 'pattern language' describes a structured collection of patterns, intended as a practical guide for architectural designers. His 'language' described contains 253 patterns split into three broad categories: towns, buildings and construction.

Patterns have proven useful in the short term to help people reuse successful practices. By demonstrating useful techniques for problem solving, patterns help people communicate more effectively because they enable people to reason more effectively about '*what'* they do and '*why*': in this sense, a pattern sets the equivalent of 'legal precedent'. In software development, design patterns are foundation rules for any developer working on elements of a project, and an 'object oriented' approach means breaking a task down into the minutiae of elements in order to 'solve' a complex programming project. The logic behind this process means a team of developers can work on the same project, knowing all the pieces will fit. Such an approach also makes a big project significantly more comprehensible, in much the same way a house is built from a series of drawings, each drawing representing a specific part of the building. For the developer, an object oriented approach means building elements which are dedicated to specific tasks; this makes fixing bugs much easier, as the 'source' of the problem can be traced to one (or a series) of objects.

Patterns offer a step toward the creation of 'handbooks' for software engineers. Pattern languages are not formal languages, but rather a collection of interrelated patterns, though they *do* provide a vocabulary for talking about a particular problem. In other words, a developer can understand *how* a piece of software has been created if they can see what pattern language was used to create it. Both patterns and pattern languages help developers communicate architectural knowledge, help people learn a new design paradigm or architectural style and help new developers ignore traps and pitfalls that have traditionally been learned only by costly experience. So how do patterns relate to computer games? Throughout this thesis, I have mentioned the development of early games, often authored by one (or two) people and I've tried to chart the development of the industry from the 'cottage' to the 'corporation'.

Nowadays, it is impossible to think of games without mentioning patterns because of the sheer complexity of them. Vast teams of developers can work on games for several years and techniques such as patterns and approaches such as object oriented programming have meant that games have moved from the simple 2D offerings we remember from the 1980s to the huge 3D labyrinths we see for sale now. It would have been impossible for a company like id Software to have created a game like *Doom* without patterns, developers and an object oriented approach.

Patterns emerged as systems for solving complex architectural projects. Computers are employed throughout the life of any architectural project from early CAD drawings, to any number of simulated 'tests' and 3D designs (or impressions) for the project. Finally, when a building management team, like London's 'Interior PLC'[83] manage and coordinate a project, computers are used throughout to track and document the process. The kinds of games we now play are built using practices taken from architecture and the software used to create buildings in physical space is also used to create buildings within games. All 3D games have 'buildings' modelled on those we find in physical space. There is, in my mind, a total fusion between computers and architecture; the two remain forever completely and utterly inseparable.

Beyond 'Structures': gaming, play, art and ludology

Now so far, I've demonstrated that formalism and structuralism have their rules for the analysis of literature. Architecture, famously, uses patterns for making designers templates and rules for creating buildings. I've demonstrated that the same is true for games: programmers now have libraries of tried-and-tested practices (patterns) for creating them. So now I'd like to address the final question: what makes games different from other forms? What do games offer to us as academics?

What's the difference between playing a game and a 'consuming' a narrative text such as a film, a novel or a television broadcast? Andrew Darley has suggested that computer games comprise a 'fundamental de-centering of narrative', claiming that playing a computer game is as much a physical as it is a mental activity (2000: 56). Walking around a city and 'walking' around a game are different: one is obviously a physical practice and the other simply isn't. But what exactly does Darley mean by de-centering narrative? His justification is that the 'spectator' is almost too busy undertaking the *performance* of playing (controlling the game, or the *avatar* in the game) that they're not necessarily concentrating on a narrative structure. Rather, the narrative in the game at the time of playing is *made* as the user moves through the game, making narrative decisions as they move. A different pattern of machine code is generated and moves through the machine in a different way each time a game runs: in a sense, gamers make the code to the game unique as their actions affect *how* that code runs *each and every time* – to me, this process seems strikingly reminiscent of De Certeau's '*Wandersmanner*' that I mentioned previously.

[83] *See:* <http://www.theoccupancybusiness.com/interior/>

Therefore, a game differs from a narrative text in that a player (rather than a spectator) is taking control in a decidedly physical way. They're deciding where to move and what to do. Their reflexes as they control the game denote how the game is played out (or plays out). Of course, anyone reading a narrative text is making decisions, but the text is decidedly fixed; it's a product in stasis. Games are dynamic in that they *mould* themselves around what the player does. Although in order to play the game, the gamer must first learn the rules of engagement: a 'two way' contract.

Espen Aarseth says games 'are not just made of sequences of signs but, rather, behave like machines or sign-generators' (*Cit.* Frasca, 2003:223). This is fundamentally one of the best distinctions I have been able to find between the 'narrative text' on the one hand and the game on the other. Structuralism has taught us to think of narrative texts as sequences of signs, each part of the sequence working in the *process of meaning* through a chain of referents. However, games are systems which dynamically create these 'chains' as players move through them.

Here, a path is drawn between understanding the 'consumption' of a narrative text (be it reception, spectatorship or any other theory) and seeing what a game text is doing. Games *flow* according to a set of rules and they are responsive to their users at the moment of play; each and every experience of a game is unique; and, of course, this is true for the consumption of narrative texts. However, with a game, the 'chain of signs' is not pre-ordained: it is for this reason that bugs in games are often difficult to locate. So there are 'objects' within a game that *exist* to manufacture new instances of objects (elements within the *mise-en-screen* of the game that the user can interact with: doors, controls, other avatars and the like). While a game is running, it is dynamically building a space from a library of objects and it presents them partially in an order dictated by coded rules, and partially in response to a user's 'requests'.

So what about art and perspective? Where do they all fit into the *mise-en-screen* of the game? The answer, of course, is everywhere: games 'quote' from everything around us. So *Grand Theft Auto 3* (Rockstar, 2001) has radio stations within the game, *Sim City 4000* (Maxis, 2003) generates newspaper reports. All 3D games have a logic we understand as 'physics', laws for negotiating a space taken from the real world, so 3D games have 'gravity'. It's this logic that means we can tell the difference between stealing and driving a bus or a sports car: both 'handle' in completely different ways. Games echo and reflect everything around them: they draw styles from absolutely everything. Much like Cubism, or the Bonaventura hotel, they quote from a range of styles. Every landscape we can imagine exists somewhere in a 3D world.

Within the game world, time and space are represented in new and breathtaking ways: a recent example can be found in the *Prince of Persia: The Sands of Time* (Ubisoft, 2004). Earlier, I mentioned that *Max Payne* (Gathering of Developers, 2001) played like *The Matrix* (1999), it had a bullet-time system to make combat easier and visually, the *mise-en-screen* looked like the film: everything is dark, worn and 'grimy' looking. *Prince of Persia* uses a technique a little like 'bullet-time', although rather than slow the frame rate of the game down, *Prince of Persia* actually allows for the *rewinding* of game time for limited periods. In other words, when a

mistake is made which could cause the prince to fall to his death, a ‘rewind’ allows the player to take the move again. My comment now sounds charged with affect, I must admit, but this function ‘feels’ remarkable when playing: it’s the ultimate empowerment. Certainly, there are 3D games which allow the user to ‘save’ at stages, but to be able to take control of the flow of a game and reverse it for *just* enough time to save restarting? It makes for a feature which I suspect will become a ‘standard’ which is copied and improved in later games. Indeed, time will tell!

So what of perspective, then? I’ve talked at length about perspective. My reason for becoming so interested in the origins of perspective is because of the notion of the ‘virtual camera’. It had come to my attention that computers could indeed emulate cameras: after all, this is the basis for CAD and 3D modelling. The popular 3D modelling application *3D Studio* (Discreet Software:2003) literally is exactly what it claims to be: a 3D studio with as many ‘cameras’ as the user desires. This is possible because computers can ‘think’ in 3D; they can understand perspective and can calculate it from any given angle. In 3D studio, a representation of a 3D object will indeed be shown from a multitude of perspectives simultaneously. This is a function which makes some recent games so fascinating. To use *Prince of Persia* again as an example: the game emulates the job of the cinema director, the vision editor or the vision mixer. While the user is playing, the game is being calculated from a multitude of perspectives. An object within the game engine decides where to have the virtual camera ‘record’ (this is important because time *can* be reversed!) or view from, in relation to the player’s avatar. It then works out how to frame the shot, curving, zooming, sliding from one position to the next with an easing that accelerates at the start and then decelerates toward the end. The game uses cinematic rules for framing shots and cuts between ‘cameras’ as the player moves. There are shots taken from below, from above, by the side, long shots, close-ups. The ‘camera’ tracks and pans and then displays. To carry my earlier analogy further: each gaming experience is the equivalent of a new ‘cut’ of a film.

Bibliography

Aarseth, E. (1997) *Cybertext: Perspectives on Ergodic Literature*, Baltimore: John Hopkins University Press.

Aarseth, E. (1999) 'Aphoria and Epiphany in *Doom* and *The Speaking Clock*' in Ryan, M.L. *Cyberspace Textuality: Computer Technology and Literary Theory*, Bloomington: Indiana University Press.

Alexander, C. (1978) A Pattern Language: Towns, Buildings, Construction, Oxford: OUP.

Althusser, Louis (1971): 'Ideology and ideological state apparatuses'. In *Lenin and Philosophy, and Other Essays.* London: New Left Books.

Anderson, C. (1996) 'The Internet' in B. Emmott [Ed.] *Going Digital: How New Technology is Changing Our Lives*, London: The Economist / Profile Books Ltd.

Ang, I. (1996) *Living Room Wars: Rethinking Media Audiences for a Postmodern World*, London: Routledge.

Appignanesi, R. (1995) *Postmodernism for Beginners*, Cambridge: Icon.

Balsamo, A. (1996) *Technologies of the Gendered Body: Reading Cyborg Women*, London: Duke University Press.

Barker, M. (1998) *Knowing Audiences: Judge Dredd, It's Friends, Fans and Foes*, Luton: University of Luton Press.

Barker, M. (2000) *From Antz to Titanic: Reinventing Film Analysis*, London: Pluto Press.

Bassett, C. (1997) 'Virtually Gendered' in Gelder, K and Thornton, S [Eds.] *The Subcultures Reader*. London: Routledge.

Barr, C. (1977) *Ealing Studios*, London: Cameron and Tayleur.

Barthes, R. (1977) *Image, Music Text: Essays*, (Trans.) Heath, S., London: Fontana Press.

Barthes, R. (1957/1972) *Mythologies*, (Trans.) Annette Lavers, London: Cape.

Barthes, R. (1975) *The Pleasure of the Text*, (Trans.) Plaisir du texte, London: Cape.

Baudrillard, J. (1984) 'The Precession of Simulacra' in Wallis, B. [Ed.] *Art After Modernism: Rethinking Representation*. Boston: Godine.

Baudrillard, J. (1995) *The Gulf War Did Not Take Place*, Sydney, Power Publications.

Benjamin, W. (1936/1970) 'The work of art in the age of mechanical reproduction' in Arendt, A. [Ed.] *Illuminations*, London: Fontana

Bennett, T. [Ed.] (1993) *Rock and Popular Music: Politics, Policies, Institutions*, London: Routledge.

Bolter, J.D. and Grusin, R. (1999) *Remediation: Understanding New Media*, London: MIT Press.

Bordwell, D. and Thompson, K. (1997) *Film Art: An Introduction*, Fifth Edition, New York: McGraw Hill.

Bordwell, D. (1985) *Narration in the Fiction Film*, London: Methuen.

Bordwell, D. (1993) *The Cinema of Eisenstein*, Cambridge, MA: Harvard University Press.

Brand, S. (1997) *The Media Lab: Inventing the Future at MIT*, New York: Viking.

Briggs, J. (1992) *Fractals: The Patterns of Chaos*, London: Thames and Hudson.

Brooks, P. (1984) *Reading For The Plot: Design and Intention in Narrative*, London: Harvard University Press.

Broadbent, G. (1990) *Emerging Concepts in Urban Space Design*, London: Van Nostrand Reinhold

Brown, L. [Ed.] (1993) *The New Shorter Oxford English Dictionary On Historical Principles*, Oxford: Oxford University Press.

Bruno, G. (1987) 'Ramble City: Postmodernism and Blade Runner' in October, 41, Summer 1987:61-74

Bruno, G. (1997) 'Site-Seeing: Architecture and the Moving Image', in *Wide Angle* Vol. 19 No:4.

Bukatman, S. (1997) *Blade Runner*, London: BFI.

Cairncross, F. (1997) *The Death of Distance: How the Communications Revolution Will Change Our Lives*, London: Orion Business Books.

Castells, M. (1996) *The Information Age: Economy, Class and Culture, Volume 1, The Rise of the Network Society*, Oxford: Blackwell.

Cherny, L. and Weise, E.R. (1996) *Wired_Women: Gender and New Realities in Cyberspace*, London: Seal Press.

Collins, J., Radner, H. and Preacher, A. [Eds.] (1993) *Film Theory Goes to the Movies*, New York: Routledge.

Colomina, B. (1994) *Privacy and Publicity: Modern Architecture as Mass Media*, Cambridge, MA: MIT Press.

Culler, J. (1998) 'The Linguistic Foundation' in Rivkin, J. and Ryan, M. [Eds.] *Literary Theory: An Anthology*, London: Blackwell

Darley, A. (1995) *The computer and contemporary visual culture: realism, post-realism and post-modernist aesthetics*, Dphil Thesis: University of Sussex.

Darley, A. (2000) *Visual Digital Culture: Surface Play and Spectacle in New Media Genres*, London: Routledge.

Dear, M. (2000) *The Postmodern Urban Condition*, Oxford: Blackwell.

Debord, G. (1967/1987) *Society of the Spectacle*, Rebel Press.

De Certeau, M. (1984) *The Practice of Everyday Life*, Berkeley, University of California Press.

Deleuze, G. (1983) *Cinema 1: The Movement Image*, London: Athlone

Deleuze, G. (1993) *The Fold: Leibniz and the Baroque*, (Trans.) Tom Conley, Minneapolis: University of Minneapolis Press.

Dery, M. (1996) *Escape Velocity: Cyberculture at the End of the Century*, London: Hodder and Stoughton.

Donald, J. and Hall, S. [Eds.] (1986) *Politics and Ideology: a Reader*, Milton Keynes: Open University Press.

Donald, J. (1999) *Imagining the Modern City*, London: Athlone Press.

Eisenstein, S. (1951) *Film Form: Essays in Film Theory* [Ed.] Leder, J. London: Dobson.

Felman, S. (1982) 'Turning the Screw of Interpretation' in Felman, S. [Ed.] *Literature and Psychoanalysis: The Question of Reading*, Baltimore: John Hopkins University Press.

Frasca, G. (2003) 'Simulation versus Narrative' in Wolf, M and Perron, B [Eds.] *The Video Game Theory Reader*, New York: Routledge.

Friedberg, A. (1994) *Window Shopping: Cinema and the Postmodern*, London: University of California Press.

Friedman, T. (1995) ‘Making Sense of Software: Computer Games and Interactive Textuality’ in Jones, S. [Ed.] *Cybersociety*, London: SAGE.

Gates, B. (1995) *The Road Ahead*, London: Viking.

Gibson, W. (1996) *Neuromancer*, London: Grafton Books

Gledhill, A, and Williams, L. (2000) *Reinventing Film Studies*, London: Arnold.

Gleick, J. (1987) *Chaos: Making a New Science*, London: Heinemann

Gray, C. (1953) *Cubist Aesthetic Theories*, Baltimore: John Hopkins Press.

Greenfield, P.M. (1984) *Mind and Media: The Effects of Television, Video Games and Computers*, London: Fontana.

Grossberg, L. (1992) *We gotta get out of this place :popular conservatism and postmodern culture*, London: Routledge.

Haddon, L. (1999) ‘The Development of Interactive Games’ in H. Mackay and T. O’Sullivan [Eds.] *The Media Reader: Continuity and Transformation*, London: Sage.

Hakken, D. (1999) *Cyborgs@Cyberspace: an Ethnographer Looks into the Future*, London: Routledge.

Hargreaves-Heap, S. and Varoufakis, Y. (1995) *Game Theory: A Critical Introduction*, London: Routledge.

Harvey, D. (1989) *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*, Oxford, Blackwell.

Heath, S. (1976) ‘Narrative Space’ in *Screen*, Vol.17: No.3 *reproduced in* Rosen [Ed.] (1986) *Narrative, Apparatus, Ideology: a Film Theory Reader*, Chichester: Colombia University Press.

Herz, J.C. (1997) *Joystick Nation: How Videogames Gobbled Our Money, Won Our Hearts and Rewired Our Minds*, London: Abacus.

Hutcheon, L. (1988) A Politics of Postmodernism: History, Theory, Fiction, Minneapolis: University of Minnesota Press.

Ihde, D. (1995) *Postphenomenology: Essays in the postmodern context*, Evanston: Northwestern University Press.

Jackson, R.L. and Rudy, S. [Eds.] (1985) *Russian formalism :a retrospective glance : a festschrift in honor of Victor Erlich*, New Haven:Yale Center for International and Area Studies.

Jameson, F. (1991) *Postmodernism, or the Cultural Logic of Late Capitalism*, London: Verso.

Jameson, F. (1989) 'Postmodernism and Consumer Society' in Foster, H. [Ed.] *The Anti-Aesthetic: Essays on Postmodern Culture*, Port Townsend, WA: Bay Press.

Jencks, C. (1991) *The Language of Postmodern Architecture*, London: Academy Editions.

Johnson, J. *et al.* (1995) 'The Xerox Star: A Retrospective' in Baecker, R.M; Grudin, J; Buxton, W.A.S. and Greenberg, S. [Eds.] *Readings in Human-Computer Interaction: Toward the Year 2000*, San Francisco: Morgan Kaufmann Publishers, Inc.

Jordan, T. (1999) *Cyberpower: The Culture and Politics of Cyberspace and the Internet*, London: Routledge.

Kinder, M. (1991) *Playing With Power in Movies, Television and Video Games: From Muppet Babies to Teenage Mutant Ninja Turtles*, Berkeley: University of California Press.

King, G. and Krzywinska (2001) *Science Fiction Cinema: From Outer Space to Cyberspace*, London: Wallflower Press.

Klinger, B. (1989) 'Digressions at the Cinema: Reception and Mass Culture' in *Cinema Journal*, Vol. 28; No. 4.

Krueger, M.W. (1991) *Artificial Reality*, Second Edition, Reading, MA: Addison-Wesley.

Kuhn, A. [Ed.] (1999) *Alien Zone II: The Spaces of Science Fiction Cinema*, London: Verso.

Lapsley, R. and Westlake, M. (1988): *Film Theory: An Introduction.* Manchester: Manchester University Press.

Laurel, B. (1991) *Computers as Theatre*, London: Addison-Wesley.

Levy, D.N.L. [Ed.] (1988) *Computer Games*, New York: Springer.

Levy, S. (1984) *Hackers: Heroes of the Computer Revolution*, New York: Dell Publishing.

Levi Strauss, C. (1960/1984) 'Structure and Form: Reflections on a work by Vladimir Propp' in Liberman, A. [Ed.] *Theory and History of Folklore: Vladimir Propp*, (Trans.) A.Y. Martin and R.P. Martin, Manchester: Manchester University Press.

Locher, J.L. [Ed.] (1982) *Escher*, London: Thames and Hudson.

Lodge, D. (1996) 'Analysis and Interpretation of the Realist Text' in Rice, P. and Waugh, P. [Eds.] *Modern Literary Theory: a Reader*, third edition, London: Arnold.

Lyotard, J.F. (1979) *The Postmodern Condition: a Report on Knowledge*, Manchester: Manchester University Press.

Mackensie, D. and Wajcman, J. [Eds.] (1999) *The Social Shaping of Technology*, 2nd Edition, Buckingham: Open University Press.

Mandlebrot, B. (1977/1983) *The Fractal Geometry of Nature*, New York: Freeman

Manovitch, L. (2001) *The Language of New Media*, London: MIT Press.

Massumi, B. (1995) 'The Autonomy of Affect' in *Cultural Critique*, No.31. Fall 1995.

McCullough, M. (1998) *Abstracting Craft: The Practiced Digital Hand*, London: MIT Press.

Merleau-Ponty, M. (1948) 'Cezanne's Doubt' in Wechsler, J. [Ed.] (1975) *Cézanne in Perspective*, New Jersey: Spectrum Books.

Monaco, S. (1981/1984) *How to Read a Film: The Art, Technology, Language, History and Theory of Film and Media*, New York: Open University Press.

Morley, D. (1992) *Television, Audience and Cultural Studies*, London: Routledge.

Morse, M. (1998) *Virtualities: Television, Media Art and Cyberculture*, Bloomington: Indiana University Press.

Mulvey, L. (1975) 'Visual Pleasure and Narrative Cinema' in *Screen*, Vol. 16 No. 3.

Munt, S. [Ed.] (2001) *Technospaces: Inside the New Media*. London: Cassell.

Murray, J. (1998) *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, London: MIT Press.

Novotny, F. (1938) 'The End of Scientific Perspective' in Wechsler, J. [Ed.] (1975) *Cézanne in Perspective*, New Jersey: Spectrum Books

O'Riordan, K. (2001) 'Playing With Lara in Virtual Space' in Munt, S.R. [Ed.] *Technospaces: Inside the New Media*. London: Cassell.

Pavlik, J. (1997) *New Media Technology: Cultural and Commercial Perspectives*, 2nd Edition, Massachusetts: Allyn & Bacon.

Pearsall, J. [Ed.] (1999) *The Oxford Concise Dictionary: 10th Edition*, Oxford: Oxford University Press.

Poole, S. (2000) *Trigger Happy: The Inner Life of Computer Games*, London: 4th Estate.

Propp, V. (1968) *Morphology of the Folktale*, Second Edition [Ed.] Wagner, L.A., (Trans.) Scott, L. London: University of Texas Press.

Provenso, Jr., E.F. (1991) *Video Kids: Making Sense of Nintendo*, London: Harvard University Press.

Rheingold, H. (1994) *The Virtual Community: Finding Connection in a Computerised World*, London: Secker and Warburg.

Richens, P. (1997) 'Computer Aided Art Direction' in Penz, F. and Thomas, M. [Eds.] *Cinema and Architecture: Méliès, Mallet-Stephens, Multimedia*, London: BFI.

Rivkin, J. and Ryan, M. (1998) *Literary Theory: An Anthology*, Oxford: Blackwell.

Rosenblum, R. (1976) *Cubism and Twentieth-Century Art*, London: Harry Abrams.

Sammon, P.M. (1996) *Future Noir: The Making of Blade Runner*, London: HarperCollins.

Saussure, Ferdinand de (1916/1983): *Course in General Linguistics* (trans.) Roy Harris. London: Duckworth

Shiff, R. (1984) *Cézanne and the End of Impressionism*, Chicago: University of Chicago Press.

Shklovsky, V. (1917/1998) 'Art as Technique' in Rivkin, J. and Ryan, M. [Ed.] *Literary Theory: An Anthology*, London: Blackwell.

Smith, B. (1998) *Modernism's history: A study in twentieth-century art and ideas*, New Haven: Yale University Press.

Stallabrass, J. (1996) *Gargantua: Manufactured Mass Culture*, London: Verso.

Stam, R., Burgoyne, R. and Flitterman-Lewis, S. [Ed.] (1992) *New Vocabularies in Film Semiotics: Structuralism, Post-Structuralism and Beyond*, London: Routledge.

Sussman, A. (1973) *The Amateur Photographer's Handbook*, New York: Thomas Y. Crowell Company.

Thornton, S. (1995) *Club Cultures: Music, Media and Subcultural Capital*, Cambridge: Polity Press.

Thrift, N. (1996) ‘New Urban Eras and Old Technological Fears: Reconfiguring the Goodwill of Electronic Things’ in *Urban Studies* Vol. 33 No. 8.

Tolson, A. (1996) *Mediations: Text and Discourse in Media Studies*, London: Edward Arnold.

Turkle, S. (1996) *Life On the Screen: Identity in the Age of the Internet*, London: Weidenfeld & Nicolson.

Vargish, T. and Mook, D.E. (1999) *Inside Modernism: Relativity Theory, Cubism and Narrative*, London: Yale University Press.

Verdi, R. (1990) *Cézanne and Poussin: The Classical Vision of Landscape*, Edinburgh: National Galleries of Scotland Press.

Wechsler, J. [Ed.] (1975) *Cézanne in Perspective*, Prentice Hall Publications.

Wertheim, M. (1999) *The Pearly Gates of Cyberspace: a History of Space from Dante to the Internet*, London: Virago.

Wimsatt, W.K and Beardsley, M.C. (1954) *The Verbal Icon: Studies in the Meaning of Poetry*, Lexington, KY: University of Kentucky Press.

Wadley, N. (1970) *Cubism*, London: Hamlyn

Woolley, B. (1992) *Virtual Worlds: a Journey in Hype and Hyperreality*. Oxford: Blackwell.

Wittig, S. (1975) *Structuralism: an Interdisciplinary Study*. Pittsburg: Pickwick Press.

Game References

Age of Empires, (1997), Microsoft / Ensemble Studios

Alien vs. Predator, (1993), Fox Entertainment / Activision.

America's Army: Soldiers (2002) US Army.

America's Army: Operations (2002), US Army.

American McGee's Alice (2000), Electronic Arts.

Anarchy Online (Funcom) <http://www.anarchy-online.com/>

Ant Attack (1983), Quicksilver

Asheron's Call (Microsoft) <http://www.microsoft.com/games/zone/asheronscall/>

Atic Attack (1983), Ultimate

Black and White (1999), Lionhead Entertainment.

Bubble Bobble (1986), Taito

Clive Barker's Undying (2001), Electronic Arts.

Columns (1995), Sega

Command and Conquer, (1995), Westwood.

Dark Forces, (1994) LucasArts

Deus Ex (2000), Ion Storm

Doom (1993), id Software.

Elite (1984), Acornsoft.

Everquest (Sony) <http://everquest.station.sony.com/>

F117A Stealth Fighter (1993), Microprose.

Final Fantasy 7 (1997), Square.

Flight Simulator 2002 (2001), Microsoft

Grand Theft Auto III (2001), Rockstar North

Grand Theft Auto II (2000), DMA Design.

Half Life (1998), Valve

Half Life: Counter Strike (2000), Valve / Sierra

Hovertank 3D (1991), id software.

It Came From the Desert (1988), Cinemaware.

Jedi Knight (1997), LucasArts.

Jedi Knight II: Jedi Outcast (2002), LucasArts

Kong (1983), Ocean.

Lemmings (1991), Psygnosis

Lineage (NCSoft) <http://www.lineage-us.com/>

Lord of The Rings Trilogy, (1986; 1988; 1989), Melbourne House.

Manic Miner (1983), Software Projects.

Maniac Mansion (1988), LucasArts.

Max Payne (2001), Gathering of Developers.

Metal Gear Solid 2 (2001), Konami

Midtown Madness 2 (2000), Microsoft.

Myst (1994), Cyan Entertainment.

Pac Man (1980), Namco.

Populous (1989), Bullfrog

Populous II (1991), Bullfrog

Prince of Persia: The Sands of Time (2004), UbiSoft.

Quake (1996), id software

Quake II (1997), id software

Quake III: Arena (1999), id software

Rainbow Islands (1990), Ocean.

Rez (2001), Sega.

Rommel's Revenge (1984), Design Soft

Scalextrix (1986), Leisure Genius.

Shadow of the Beast (1990), Psygnosis

Sim City (1989), Maxis

Sim City 4000 (2003), Maxis

Soldier of Fortune (2000), Loki Games.

Sonic The Hedgehog (1991), Sega.

Space Invaders (1979), Taito

Space War (1961), Russell, Graetz, and Kotok.

Starquake (1985), Bubble Bus

Star Raiders (1979), Atari.

Star Wars Galaxies (2001), LucasArts

Super Mario Bros. (1985), Nintendo

Test Drive (1987), Accolade.

Tetris (1985), Alexey Pazhitnov

The Hobbit (1982), Melbourne House

The Sims (2000), Electronic Arts / Maxis.

Tomb Raider (1986), Eidos Entertainment.

Train Simulator (2000), Microsoft.

Ultima Online (Origin) <http://www.uo.com/>,

Under a Killing Moon (1994), Access.

Virus: The Game (1997), Sirtech

Wolfenstein 3D (1992), id Software.

Film and Documentary References

Artificial Intelligence (2001) Dir: Stephen Spielberg

Back to the Future (1985) Dir: Robert Zemeckis

Blade Runner (1982) Dir: Ridley Scott

Blair Witch Project (1999) Dirs: Daniel Myrick and Eduardo Sanchez.

Citizen Kane (1941) Dir: Orson Welles

Jurassic Park (1993) Dir: Stephen Spielberg

La Jetee (1962) Dir: Chris Marker

Lara Croft: Tomb Raider (Paramount, 2001)

La Voyage Dans La Lune (1902) Dir: Georges Méliès

L'arrivée d'un train en gare (1895) Dirs: Louis and Auguste Lumiere

Lord of the Rings Part One: The Fellowship of the Ring (2001) Dir: Peter Jackson

Lord of the Rings Part Two: The Two Towers (2002) Dir: Peter Jackson

Lord of the Rings Part Three: The Return of the King (2003) Dir: Peter Jackson

Man With a Movie Camera (1929) Dir: Dziga Vertov

Memento (2000) Dir: Christopher Nolan

Metropolis (1927) Dir: Fritz Lang

Monsters Inc. (2001) Dir: Peter Docter

Notting Hill (1999) Dir: Roger Mitchell

Resident Evil (Sony, 2002)

Steamboat Willie (1928) Dir: Walt Disney

The Crow (1993) Dir: Alex Proyas

The Computer that Ate Hollywood (1999), BBC Productions

Them! (1954) Dir: Gordon Douglas

The Matrix (1999) Dirs: Andy and Larry Wachowski

Titanic (1997) Dir: James Cameron

Toy Story (1995) Dir: John Lasseter

Tron (1982) Dir: Stephen Lisberger

Vertigo (1958) Dir: Alfred Hitchcock

Magazine and Newspaper References:

Collins, B. and Garratt, P. (2002) 'Why British games are monster hits' in *The Sunday Times* (Culture, 6/1/2002:49).

Online References

Aarseth, E. "Allegories of Space: The Question of Spatiality in Computer Games", University of Bergen; 1998:
<http://www.hf.uib.no/hi/espen/papers/space/> (29-9-02)

Adams, E. "Three Problems for Interactive Storytellers", Gamasutra; 29/12/99:
<http://www.gamasutra.com/features/designers_notebook/19991229.htm> (29-9-02)

Antonaides, A. "The Worlds of Peter Molyneux", Wired News; 13/11/00:
<http://www.wired.com/news/print/0,1294,39359,00.html> (29-9-02)

Baig, E.C. "At-home vision in 3-D is only as cool as its content", USA Today; 6/03/02:
<http://www.ddd.com/aboutus/articles/usatoday_march02.htm> (29-9-02)

BBC. "Britons Dash For Broadband", BBC; 13/04/02:
<http://news.bbc.co.uk/1/hi/sci/tech/1869151.stm> (29-9-02)

BBC. "Broadband Set to Triple in 2002", BBC; 18/21/01:
<http://news.bbc.co.uk/1/hi/business/1717433.stm> (29-9-02)

BBC. "Bruce Lee 'Recreated' for Comeback", BBC; 15/11/01:
<http://news.bbc.co.uk/1/hi/entertainment/film/1658394.stm> (29-9-02)

BBC. “Follow the Stars”, BBC; 15/06/99:
<http://news.bbc.co.uk/1/hi/entertainment/369373.stm> (29-9-02)

BBC. “Freeing Up the TV Frequencies”, BBC; 21/02/02:
<http://news.bbc.co.uk/1/hi/sci/tech/450313.stm> (29-9-02)

BBC. “Lift-off for Low-Cost Satellite Broadband”, BBC; 15/04/02:
<http://news.bbc.co.uk/1/hi/sci/tech/1931217.stm> (29-9-02)

BBC. “Record Year For Computer Games”, BBC; 10/01/02:
<http://news.bbc.co.uk/1/hi/entertainment/new_media/1752522.stm> (29-9-02)

BBC. “The Computer that Ate Hollywood”, BBC Horizon; 30/4/98:
<http://www.bbc.co.uk/science/horizon/specialfx.shtml> (29-9-02)

BBC. “UK Digital TV Turn-On Outlined”, BBC; 17/9/99:
<http://news.bbc.co.uk/1/hi/uk/449849.stm> (29-9-02)

BBC. “UK to Speed Up Broadband”, BBC; 3/12/01:
<http://news.bbc.co.uk/1/hi/business/1689929.stm> (29-9-02)

BBC. “Video Games ‘Stimulate Learning’”, BBC; 18/03/02:
<http://news.bbc.co.uk/1/hi/education/1879019.stm>

BBC. “Will 2002 be the Year For Broadband”, BBC; 14/01/02:
<http://news.bbc.co.uk/1/hi/sci/tech/1755343.stm> (29-9-02)

Bormann, A. “Interviews With Past Cinemaware Employees”, Justadventure.com; 2002:
<http://www.justadventure.com/Interviews/Cinemaware/Cinemaware_Interview.shtm>

Braben, D. “Another 5 Years From Now: Future Technologies”, Frontier Developments; 2002:
<http://www.frontier.co.uk/press/articles/gdc2002-5yrsfromnow.ppt> (29-9-02)

Bremner, B. “Microsoft vs. Sony: Mortal Combat”, Buisnessweek Online; 3/04/02:
<http://www.businessweek.com/bwdaily/dnflash/apr2001/nf2001043_175.htm> (29-9-02)

Brotherson, C. “Gamecube European Sales Report Success”, Games Domain; 2002:
<http://www.gamesdomain.com/news/7502.html> (29-9-02)

Brown, J. “Coming Soon to Computer Games – Advertising”, Salon 21st; 2000:
<http://archive.salon.com/21st/feature/1999/03/22feature.html> (29-9-02)

Bucher, C. “Architecture as a Narrative Medium”, altx.com; 1996:

<http://www.altx.com/ebr/reviews/rev7/r7buc.htm> (29-9-02)

Buckingham, D. and Sefton-Green, J. “Pokemon in Five Cultures: A Cross-Cultural Analysis of Children’s Global Media Culture”, CCSOnline; 2000: <http://www.ccsonline.org.uk/mediacentre/Research_Projects/pokemon.html> (29-9-02)

Byrd, T. “GDC 2001 Game Design Keynote: Will Wrights ‘Design Plunder’” Gamasutra.com; 23/03/02: <http://www.gamasutra.com/features/20010323/byrd_01.htm> (29-9-02)

Cameron, A. “Dissimulations: Illusions of Interactivity”, MFJ Online, 28:Spring 1995: <http://mfj-online.org/journalPages/MFJ28/Dissimulations.html> (29-9-02)

Capanna, A. “Conoids and Hyperbolic Paraboloids in Le Corbusier's Philips Pavilion”, Nexus Journal; July 2000: <http://www.nexusjournal.com/N2000-Capanna.html>

Cassy, J. and Wells, M. “Plug Pulled on ITV Digital and 1,500 Jobs”, Guardian Unlimited; 1/05/02: <http://www.guardian.co.uk/uk_news/story/0,3604,707938,00.html> (29-9-02)

Clark, A. “Users May Pay the Cost of 3G Licences”, EE Times; 5/05/02 <http://www.electronicstimes.com/story/OEG20020503S0024> (29-9-02)

CRIC. “Playing with the Future: Development and Directions in Computer Gaming”, CRIC; 2002: <http://www.cric.ac.uk/cric/gamerz/> (29-9-02)

Davies, J. “Introduction to IP Version 6”, Microsoft Corporation; February 2002: <http://www.microsoft.com/windows2000/docs/ipv6.doc> (29-9-02)

Deans, J. and Gibson, O. “Government Will Not Save ITV Digital”, Media Guardian; 22/04/02: <http://media.guardian.co.uk/city/story/0,7497,688910,00.html> (29-9-02)

Dunnill, R.J. “The Origins of the Original Divx”, Tech TV; 17/01/02: <http://www.techtv.com/screensavers/answerstips/story/0,24330,3368584,00.html>

ELSPA. “30th Anniversary of the Computer Game: Britain Gets Ready for the Biggest Boom in Video Games Ever”, ELSPA; Summer 2002: <http://www.elspa.com/mediapack/intro.html> (29-9-02)

Eskelinen, M. “The Gaming Situation”, Game Studies Journal; July 2001: <http://www.gamestudies.org/0101/eskelinen/> (29-9-02)

Evans, R. and Barnet Lamb, T. “GDC 2002: Social Activities: Implementing Wittgenstein”, Gamasutra, 24/04/02:

<http://www.gamasutra.com/features/20020424/evans_01.htm> (29-9-02)

Frasca, G. “The Sims: Grandmothers are Cooler than Trolls”, Game Studies Journal; July 2001:
<http://www.gamestudies.org/0101/frasca/> (29-9-02)

Frasca, G. “Videogames of the Oppressed: Videogames as a Means for Critical Thinking and Debate”, Jacaranda.org; 2001:
<http://www.jacaranda.org/frasca/thesis/> (29-9-02)

GamaNetwork. “Game Developers Choice Awards’ Honor Lifetime Achievement and Ground-Breaking Work in the Game Development Industry”, GamaNetwork; 21/3/02:
<http://www.gamanetwork.com/press_032101.html> (29-9-02)

Gibson, O. “Football League Says ITV Digital Ruined Little People Too”, Media Guardian; 13/06/02:
<http://media.guardian.co.uk/itvdigital/story/0,11829,736943,00.html> (29-9-02)

Grassin, J.M [Ed.], “FORMALISM(E)”, Dictionnaire International des Termes Littéraires: <http://www.ditl.info/art/definition.php?term=1883> (14-4-04)

Green, C. “Pac Man”, Salon.com Arts and Entertainment; 17/06/02:
<http://www.salon.com/ent/masterpiece/2002/06/17/pac_man/> (29-9-02)

Grzinic, M. “Spectralisation of Space: The Virtual-Image and Real-Time Interval”; Mars-patent.co.uk; 2000:
<http://www.mars-patent.org/projects/marina/marina.pdf> (29-9-02)

Hirst, C. “Bad Signal For Broadband Britain”, Independent.co.uk; 7/04/02:
<http://news.independent.co.uk/digital/features/story.jsp?story=282266> (29-9-02)

James Au, W. “Playing Games With Free Speech”, Salon.com Technology and Business, 6/05/02:
<http://www.salon.com/tech/feature/2002/05/06/games_as_speech/index.html> (29-9-02)

Jenkins, H. “Game Design as Narrative Architecture”, MIT; 2000:
<http://web.mit.edu/21fms/www/faculty/henry3/games&narrative.html> (29-9-02)

Jenkins, H. “Reception Theory and Audience Research: The Mystery of the Vampire’s Kiss”, MIT; 2000:
<http://web.mit.edu/21fms/www/faculty/henry3/consume.html> (29-9-02)
also in Gledhill, A, and Williams, L. [Ed.] (2000) *Reinventing Film Studies*, London: Arnold.

Jencks, C. “The City That Never Sleeps”; New Statesman; 28/6/02:

<http://www.findarticles.com/cf_0/m0FQP/n4290_v125/18524261/print.jhtml> (29-9-02)

Juul, J. “Games Telling Stories? A Brief Note On Games and Narratives”, Game Studies Journal; July 2001:
<http://www.gamestudies.org/0101/juul-gts/> (29-9-02)

Juul, J. “What Computer Games Can and Can’t Do”, Jesperjuul.dk; 2000:
<http://www.jesperjuul.dk/text/WCGCACD.html>

Ketola. “Game Cube Price Cut as Well”, Afterdawn.com; 22/04/02:
<http://www.afterdawn.com/news/archive/2846.cfm> (29-9-02)

Ketola. “Microsoft Slashes Xbox price in Europe”, Afterdawn.com; 18/04/02:
<http://www.afterdawn.com/news/archive/2831.cfm> (29-9-02)

Leaf, T. “Xbox Prices Get Slashed Up Severely”, Gamitopia; 21/04/02:
<http://www.gamitopia.com/news/stories/2002/04/21/10194537501.php> (29-9-02)

Lichtarowicz, A. “Virtual Kingdom Richer Than Bulgaria”, BBC News Online; 29/03/02: <http://news.bbc.co.uk/1/hi/sci/tech/1899420.stm> (29-9-02)

Manovich, L. “An Archaeology of a Computer Screen”, Manovich.net; 1995:
<http://www-apparitions.ucsd.edu/~manovich/text/digital_nature.html> (29-9-02)

Manovich, L. “Avant-Garde as Software”, Manovich.net; 1999:
<http://www.manovich.net/docs/avantgarde_as_software.doc> (29-9-02)

Manovich, L. “Cinema as a Cultural Interface”, Manovich.net; 1997:
<http://www-apparitions.ucsd.edu/~manovich/text/cinema-cultural.html> (29-9-02) *and* <http://www.manovich.net/TEXT/cinema-cultural.html>

Manovich, L. “Cinema By Numbers: ASCII Films by Vuk Cosic”, Manovich.net; 1999:
<http://www.manovich.net/docs/cinema_by_numbers.doc> (29-9-02)

Manovich, L. “The Mapping of Space: Perspective, Radar and 3D Computer Graphics”, Manovich.net; 1993:
<http://www.manovich.net/text/mapping.html>

Manovich, L. “The Aesthetics of Virtual Worlds”, Manovich.net; 1996:
<http://www-apparitions.ucsd.edu/~manovich/text/virt-space.html> (29-9-02)

Mark, J. “Online Gaming to Increase Sixfold”, ISP Review; 6/7/02:
<http://www.ispreview.co.uk/cgi-bin/ispnews/printnews.cgi?newsid1023457528,85446,> (29-9-02)

McLean-Forman, J. “An Interview With Will Wright”, Gamasutra, 1/05/01:

<http://www.gamasutra.com/features/20010501/wright_01.htm> (29-9-02)

Mediawatch. “Teaching Boys to Kill”, Mediawatch.com Archives: <http://www.mediawatch.com/dukenukem.html> (29-9-02)

Middleton, J. “UK Government Slammed Over 3G Auction”, VNUNET; 15-06-00: <http://www.vnunet.com/News/1103271> (29-9-02)

Miyake, K. “Sony Cuts the Price on Playstation 2”, IDG News Service; 29/06/01: <http://www.idg.net/idgns/2001/06/29/SonyCutsPriceOnPlayStation2.shtml> (29-9-02)

Molyneux, P. “Postmortem: Lionhead Studios’ *Black and White*”, Gamasutra; 13/06/01: <http://www.gamasutra.com/features/20010613/molyneux_pfv.htm> (29-9-02)

Morris, C. “Your Tax Dollars at Play: U.S. Army gets into the gaming business. You're paying for it”, CNN Money; 03/06/02: <http://money.cnn.com/2002/05/31/commentary/game_over/column_gaming/index.htm>

Murphey, M. “On Tetris: Its Past, and Kaiser's HyperTetris” NCSA; Spring 01: <http://archive.ncsa.uiuc.edu/Classes/MATH198/mmurphey/tetris.html> (29-9-02)

Ndalainis, A. “Baroque Perceptual Regimes”, Senses of Cinema; 25/3/02: <http://www.sensesofcinema.com/contents/00/5/baroque.html> (29-9-02)

Ndalainis, A. “Frenzy of the Visible: Spectacle and Motion in the Era of the Digital”; Senses of Cinema; 2000: <http://www.sensesofcinema.com/contents/00/3/matrix.html> (29-9-02)

Payton, N.I. “Architecture and the Moving Image: Film and Video”, National Building Museum; 1990: <http://www.nbm.org/blueprints/90s/summer90/page3/page3.htm> (29-9-02)

Planet BW Team “Black and White FAQ”, Planetbw.com, 2001/2: <http://www.planetblackandwhite.com/blackandwhite/faq/> (29-9-02)

Planet BW Team “Project C.R.E.E.D.: Creature Research and Extended Entity Documentation”, Planetbw.com, 2001/2: <http://www.planetblackandwhite.com/features/articles/reader/0015.shtml> (29-9-02)

Richard, C. Okamura, A.M., Cutkosky, M.R. “Feeling is Believing: Using a Force-Feedback Joystick to Teach Dynamic Systems” Stanford University; 2000: <http://pegasus.me.jhu.edu/~allisono/publications/old/asee00-richard.pdf> (29-9-02)

Richardson, T. “Freeserve Slams Oftel Over BT Broadband”, The Register; 20/05/02: <http://www.theregister.co.uk/content/22/25358.html> (29-9-02)

Riddell, R. “Doom Goes To War: The Marines are Looking for a few Good Games”, Wired Archive, 5.04: April 1997:
<http://www.wired.com/wired/archive/5.04/ff_doom_pr.html>

Russell, C. “Parallax Historiography: The Flâneuse as Cyberfeminist”; University of Nottingham; 1/07/00:
<http://www.nottingham.ac.uk/film/journal/articles/parallax-historiography.htm> (29-9-02)

SCEI. “Playstation 2 Achieves Record Sales of 5 Million Units Worldwide in the Holiday Season”, SCEI Japan; 9/1/02:
<http://www.scei.co.jp/corporate/release/pdf/020109e.pdf> (29-9-02)

Smith, B. “The Formalesque Style”, Murdoch University; 2001:
<http://wwwistp.murdoch.edu.au/publications/e_public/amhope/smith.html> (29-9-02)

Snider, M. “Gamers Create a ‘God Game’ Frenzy”, USA Today; 08/02/02
<http://www.usatoday.com/life/cyber/tech/review/games/2001-08-02-god-games.htm>

Snider, M. “Where Movies End, Games Begin”, USA Today; 23/05/02:
<http://www.usatoday.com/life/cyber/tech/review/2002/5/23/e3.htm> (29-9-02)

Sparacino, F., Davenport, G. and Pentland, A. “City of News”, MIT/KOS; August/September 2000:
<http://vismod.www.media.mit.edu/~flavia/Papers/CityOfNewsKOS.pdf> (29-9-02)

Spooner, J. “Inside Intel: Betting on the Future”, ZDNet News; 24/7/02:
<http://zdnet.com.com/2100-11-502616.html?legacy=zdnn> (29-9-02)

Stutz, M. “Tama-Hackers Play God, Catch Hell” Wired Techology; 20/8/02:
<http://www.wired.com/news/technology/0,1282,6229,00.html> (29-9-02)

Sweet, D. “Minding the Gap: The Social Space of Painting”, Manchester MU; 2000:
<http://www.finearts.mmu.ac.uk/painting/davidsweet.htm> (29-9-02)

Tournikiotis, P. “Architectural Space in Ancient Greece”, Doxiadis.org; 1972:
<http://www.doxiadis.org/documents/ekistics/doc_028.asp> (29-9-02)

Wakefield, J. “Broadband For All: Government Pledges”, ZDNet UK; 13/02/01:
<http://news.zdnet.co.uk/story/0,,s2084406,00.html> (29-9-02)

Wakefield, J. “Broadband Goes Down the Drain”, BBC News; 24/01/02:
<http://news.bbc.co.uk/1/hi/sci/tech/1777972.stm> (29-9-02)

Wakefield, J. “UK Broadband Plans Slow to Bear Fruit”, BBC News; 2/02/02:

<http://news.bbc.co.uk/1/hi/sci/tech/1791927.stm> (29-9-02)

Ward, M. “Sony Targets Talking Goods”, BBC News; 5/04/02:
<http://news.bbc.co.uk/1/hi/business/1262927.stm> (29-9-02)

Wired. “Just Outta Beta”, Wired Archive; 8.02: Feb 2000:
<http://www.wired.com/wired/archive/8.02/streetcred.html?pg=14> (29-9-02)

Wischik, L. “Black and White Creature Training, Or: Watch What He’s Thinking!”: Wishchik.com; 2002:
<http://www.wischik.com/lu/senses/bwcreature.html> (29-9-02)

Wong, J. and Storkerson, P. “Hypertext and the Art of Memory”, Visible Language; 31.2:1997:
<http://www.id.iit.edu/visiblelanguage/Feature%20Articles/ArtofMemory/ArtofMemory.html> (29-9-02)

Wray, R. “BT Net ‘advantage’ Angers Freeserve”, Guardian Unlimited; 21/05/02:
<http://www.guardian.co.uk/internetnews/story/0,7369,719364,00.html> (29-9-02)

ZDNet Australia. “GTA 3 Officially Banned in Australia”, ZDNet; 13/12/01:
<http://www.zdnet.com.au/printfriendly?AT=2000025001-20262360> (29-9-02)