A woodcut from 'A Moderne House-Keeping'*,*
a chapbook published in Sheffield by William Cryer, c.1760

Project knole

An Autocosmic Approach To Authoring A Resonant Computational Character

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Declaration Of Conflicting Interests

The author is aware of no conflicting interests that would affect the integrity of this thesis.

Abstract

Throughout history fictional characters in narrative art have affected audiences emotionally, cognitively and socially.[1][2][3] This affect arises principally from the human imagination, and the capacity of audiences to extrapolate more complete realities, and persons, from incomplete representations.[4] The perceived 'quality' of a character produced by an artist is directly related to how and to what extent that character courts this human capacity: a quality I define nominally as 'resonance'.

Many critics privilege such artistically-derived imaginings, so important to the artistic process, as 'aesthetic illusions'[5], but they have continuance with the wider human faculty to mentally simulate[6][7]; a spectrum of experience which I nominally define as the 'autocosmic'. The 'autocosmic' encompasses many supposedly unaesthetic phenomena in everyday mental and perceptual life which nonetheless provoke powerful narrative and characterful responses in their hosts.

The advances of computer technology have given rise to 'particular'[8] potentials for the representation of fictional characters, owing to the mode's technical properties of interactive, dynamic, systemic procedurality[9]. However, the creation of fictional characters that both fulfil this potential and are subjectively 'resonant' has proved extremely challenging.[10][11][12]

Project `knole`, consisting of this thesis and a multimodal installation artwork presented as a work of digital heritage interpretation, embodies a methodology for creating computational characters that are both 'resonant' and explorative of their computational potential. This involves striking a balance between authoring a

1 Jowett, Benjamin *The Republic by Plato,* 2009 [Online]. Available at: http://classics.mit.edu/Plato/republic.11.x.html [Accessed: 8th August 2018].
2 Oatley, Keith 'A taxonomy of the emotions of literary response and a theory of identification in fictional narrative'. *Poetics* 23(1), 1994, pp. 53 -74.
3 Palmer, Alan *Fictional Minds* Nebraska: University of Nebraska Press, 2004.
4 Dennett, Daniel *Breaking The Spell: Religion as a natural phenomenon.* London: Penguin, 2007.
5 Wolf, Werner *Illusion (Aesthetic): The living handbook of narratology,* 2014 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/illusion-aesthetic [Accessed: 8th August 2018].
6 Sklar, Howard 'Believable Fictions: On The Natur Of Emotional Responses to Fictional Characters'. *The Electronic Journal of the Department Of English at the University of Helsinki* 5(1), 2009, pp. 1 – 25.
7 Vermeule, Blakey *Why Do We Care About Literary Characters?* Baltimore: John Hopkins University Press, 2010.
8 Keogh, Brendan *Videogames aren't special. Videogames aren't unique*, 2015. [Online] Available from: https://brkeogh.com/2015/04/30/videogames-arent-special-videogames-arent-unique/ [Accessed 30th March 2018].
9 Manovich, Lev *The Language of New Media.* Massachusetts: MIT Press, 2001.
10 Salen, Katie and Zimmerman, Eric. *Rules Of Play: Game Design Fundamentals.* Massachusetts: MIT Press, 2004.
11 Crawford, Chris *Chris Crawford: don't die, 2015* [Online]. Available at: http://www.nodontdie.com/chris-crawford/ [Accessed: 8th August 2018].
12 Bogost, Ian *Video Games Are Better Without Stories*, 2017 [Online]. Available at https://www.theatlantic.com/technology/archive/2017/04/video-games-stories/524148/ [Accessed 8th August 2018].

procedural computational system and employing the ability of that system to resonate with the imagination of the audience. In particular, the work looks for inspiration for that balance in examples of the human imagination engaging with meaningful, 'resonant' systems outside the obviously aesthetic and authorial: systems found, on the 'autocosmic' spectrum, in the everyday world.

This thesis focusses on one example of such inspiration for the Project: the resonant, autocosmic relationship between people and places. Drawing on examples of social and interactive human engagement with landscapes throughout history, the fictional characters at the heart of the Project were designed using the relatively-sophisticated tenets of virtual environment design. This resonant 'character-as-environment' represents just one implementation of a wider autocosmic methodology for creating computational characters.

Primary Research Question

"How might a character in computational art maintain their defining quality of dynamic agency within a system, while achieving the 'resonant' qualities of characters in more static art-forms?"

Contents

"A Spyrit... [of] Covenient Providense"

Introducing Project `knole`

On 19th August 1758, under the sound of a high-voiced bell, a figure slipped from the gates of Mr. Elijah Knole's cotton mill, high on the gritstone moors above the city of Sheffield in England. A wealthy Methodist of humanitarian bent, Mr. Knole had built the mill in this lonely place to exploit the flow of the river Night in powering his machines, as well as governing the employment (and the salvation) of the surrounding hamlets. It was to one of these hamlets that the figure now hastened: a small huddle of houses called Nighthead, perched even higher on the rain-lashed fens.

The figure was a young woman named Anne Latch, who had lived in Nighthead her entire life. She kept a spartan yet sturdy house built by her father Caleb, who had died when Anne was young, leaving her raising to neighbours Sarah and Matthew Marchand. When she was old enough, Anne joined them in working at Knole's mill. As usual, Anne was hurrying home after a long shift, eager to shut herself indoors out of the rain. She hated to be out on the moor: not, as for many of her contemporaries, because she was afraid of the 'medley of supernatural figures'[13] which many still believed to lurk there. Anne's own superstitions were private and unexpressed, her personal universe populated by more mundane horrors.

Reaching the door, Anne bolted it behind her and rushed straight to the kitchen: the quietest room, and her favourite. She knew its dimensions so well that, as she lit candles and carefully removed her soaked shawl, she quickly noticed that something was awry. In the mortar of the ashlared wall she saw a thin crack, about as tall as a mousehole, emitting a pale glow. She lowered herself onto her aching knees, worn raw by yarn and machine oil, and looked inside. A pair of wan, pupil-less eyes looked back,

13 Wilby, Emma 'The Witch's Familiar and the Fairy in Early Modern England and Scotland'. *Folklore* 111 (2), pp. 283 – 205, 2000, p. 301.

and from somewhere in that little, glowing darkness came a faint, plaintive mewl.

* * * * * *

This is only the beginning of Anne's story: a story which will engulf two years of her life, and remain inextricably entwined with this being – a supernatural creature that she came to call her 'spyrit' – living in the very fabric of her home. In this story, she comes to emancipate herself from the mill, and transforms herself into a 'cunning woman'; a breed of magical healer, soothsayer and 'shrewd entrepreneur'[14] who throughout British history has tended to the superstitions, quarrels and psychosomatics of the populace[15]. She comes to use this strange creature as her assistant in this, as her 'familiar spirit'[16]. Anne, her narrative and its further consequences are the subject of the work which this thesis contexualises: a multi-modal installation artwork called Project `knole`, with both textual and computational elements, designed for display to audiences in museums and galleries.

While it may seem unnecessary to establish, Anne's story is most definitely a fictional one. Anne, the village of Nighthead[17], her husband John and the 'spyrit' did not ever exist in any material sense. While the textual elements of `knole` present themselves as primary sources, written by Anne herself and her contemporaries, they are most properly considered 'counterfactual', pseudepigraphical, or works of 'fantasy history'[18]: drawing on Possible World theory[19], it is a particular and 'non-actual'[20] version of 18th century England, occupying the narrative space which Maître delineates as 'an oscillation between could-be-actual and could-never-be-actual'[21]. In this, it forms part of a rich tradition of

14 Davies, Owen 'Cunning-Folk in England and Wales during the Eighteenth and Nineteenth Centuries'. *Rural History* 8 (1), 2008, pp. 91-107, p. 94.
15 Davies, Owen *Popular Magic: Cunning-folk in English history*. London: Hambleton Continuum, 2007.
16 Wilby, Emma, 2000, p.301.
17 See Appendix #9, Figure 16
18 Morse, Donald E. ' The Rise of Counterfactual History and the Permeability of Disciplines' *In: Displacing The Anxieties of Our World: Spaces of the Imagination.* Newcastle: Cambridge Publishers, 2017. p.13.
19 Ryan, Marie Laure *Possible Worlds* [Online], 2013. Available at: http://www.lhn.uni-hamburg.de/article/possible-worlds [Accessed 18th August 2018].
20 Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions'. *Style* 21 (1) 1987, pp.107-124 , p. 110.
21 Ryan, Marie Laure 'Possible-Worlds Theory'. *In:* Herman, David *et al.* (*eds.*) *The Routledge Encyclopedia of Narrative Theory*. London: Routledge, 2005, pp. 446-450, p. 449.

'museum[s] as a site of activity'[22] for artists, through 'interventions'[23] and residencies, creating 'self-reflexive exhibitions'[24] 'play[ing] with… historical consciousness'[25] and producing deliberately aesthetic work in academic or historical contexts.

Like other such works, however (Birchall gives a thorough overview[26]), `knole` is not entirely fanciful: it is still of firm historiographical and educational value in the study of the 'actual' 18th century England, and all the overlapping systems of meaning that such a place and time encompassed. Using fictionality, aesthetic license and what Connie Willis calls a 'divergence point' from history[27], alongside solid research of the time period, it serves as a work of heritage interpretation, 'reveal[ing] deeper meaning and truth'[28], 'provok[ing]' and 'forg[ing] emotional and intellectual connections'[29] between its audience and the themes, concerns and experiences of that era of history. It communicates and develops understanding about the traditions of 'cunning folk' and 'low magic'[30]; familiar spirits, demons and fairies[31]; the nature of religious belief and superstitious practices; and the systems of gender, law, class, science, social relations, the press and working life during what is often called the 'long eighteenth century'[32]: a century which, while witnessing a supposed Rationalist transformation[33] of public and private existence over its tumultuous length, remains a period in which the truth on any subject is certainly multifarious, and often difficult to establish at all.

As Hayden White counsels, it is these tangled truths which concern the study of history most of all: how the reality of the past is understood, and misunderstood, when communicated to those who seek to understand it. This understanding, this 'conjuring' as White has it, 'requires art as well as information': narrative, particularly fictional narrative,

22 Crane, Susan A. *'Memory, Distortion and History in the Museum'. In:* Carbonell, Bettina Messias *Museum Studies: An Anthology of Contexts*. Chichester: Wiley-Blackwell, 2012. p. 334
23 Tomb of unknown craftsman
24 Ibid p. 300.
25 Ibid p. 308.
26 Birchall, Danny I*nstitution and Intervention: Artists' Projects in Object-Based Museums.* [MA Dissertation]. Birkbeck College, University of London.
27 Willis, Connie *Blackout.* USA: Ballantine, 2010.
28 Beck, Larry and Cable, Ted T. *The Gifts Of Interpretation.* Illinois: Sagamore, 2011, pp. xxiii.
29 *National Association For Interpretation: What Is Interpretation?* [Online], 2018. Available at: https://www.interpnet.com/NAI/interp/About/About_Interpretation/nai/_About/what_is_interp.aspx?hkey=53b0bfb4-74a6-4cfc-8379-1d55847c2cb9 [Accessed 18th August 2018].
30 Davies, Owen, 2007.
31 Wilby, Emma, 2000.
32 Davies, Owen, 2007, p. 31.
33 Davies, Owen and De Bleacourt, Willem *Beyond the Witch Trials.* Manchester: Manchester University Press, 2004.

becomes a 'valuable adjunct'[34] to heritage interpretation[35][36][37]. Like all narratives, history is focussed on the 'subjectivity of individuals'[38][39] 'making concrete choices in given circumstances'[40] 'in [a] certain place… in certain times'[41]; 'humanity in the plural'[42] often driven, scaffolded and ultimately concerned with the lives of individual figures, of persons, 'meaningfully historicized'.[43] The grand historical motions in Project `knole` underlie what is, in essence, a rather humble and personal story; the story of Anne, and her 'spyrit', and the other persons that intrude on their small, bracken-bound universe; a story of love, toil, faith, misunderstanding, jealousy, loneliness, fear, revenge and hubris. It is the construction, and use, of representations of such individuals, such characters – whether fictional or real, discovered in archives or created by an artist – that form the crux of this project's academic enquiry. `knole` is not just a narrative containing characters: it concerns the very concept of characters themselves, and the process of using them as a tool of 'communication and understanding'[44].

* * * * * *

It is this process – this methodology of designing characters to communicate, and how the nature and effectiveness of this process is measured and reflected upon – which is of ultimate concern of this work. Both within and without heritage interpretation, narratives and characters can be broadly defined thus as tools of demonstration, lives put to work in 'texts'[45] for some communicative 'intent or purpose'[46]. Some of those purposes may be deliberate in the 'originating communicator'[47], 'persuasive

34 White, Hayden 'Introduction: Historical Fiction, Fictional History, and Historical Reality'. *Rethinking History* 9 (2/3), 2005, pp.147 – 157, p. 149.
35 Goins, Elizabeth S. *et al.* 'Modding The Humanities: Experiments in Historic Narratives'. *Journal Of Interactive Humanities* 1 (1), 2013, pp.13-23.
36 Roussou, Maria. 'Learning by doing and learning through play: an exploration of interactivity in virtual environments for children'. *Computers In Entertainment* 2, pp. 1-10.
37 Matelic, Candace Tangorra. 'Re-imagining heritage interpretation: enchanting the past-future'. *Museum Management & Curatorship* 29 (5), 2014 pp. 519-522.
38 Neithammer, Lutz *Posthistoire.* London: Verso, 1992, p. 149
39 Matelic, Candace Tangorra, 2014.
40 Greenblatt, Stephen 'Resonance and Wonder'. *Bulletin of the American Academy of Arts and Sciences* 43 (4), 1990, pp. 11-34, p.30.
41 *Inner Lives Project: Histories From Within*, 2018 [Online]. Available at: https://innerlives.org/about/ [Accessed 18th August 2018].
42 Cohn, Dorritt 'Fictional versus Historical Lives: Borderlines and Borderline Cases'. *The Journal of Narrative Technique*. 19 (1), 1989, pp. 3-24, p. 3.
43 *Inner Lives Project: Histories From Within*, 2018 [Online].
44 Oatley, Keith and Mar, Raymond 'The Function of Fiction is the Abstraction and Simulation of Social Experience'. *Perspectives on Psychological Science* 3 (3), 2008, pp. 173-193, p. 173.
45 Lotman, Yuri *The Structure of the Artistic Text*. Ann Arbor: University of Michigan Press, 1977.
46 Dean, David. *Museum Exhibition: Theory and Practice.* London: Routledge, 1994, p. 4.
47 Mellmann, Katja 'On the Emergence of Aesthetic Illusion An Evolutionary Perspective'. *In:* Wolf, Werner. *Immersion and Distance: Aesthetic Illusion in Literature and Other Media.* Amsterdam: Rodopi, 2013.

[or] didactic'[48] in nature: some may remain unconscious, or entirely unexpected by the artist. But it is from this sense of purposeful methodology – work done according to some set of objectives – that shapes the enormous set of evaluative cultures and ontologies that have arisen around character. We do not just ask what it is characters do: we ask how well they do it. It is not particularly controversial to say that artists, audiences and critics alike are concerned with the 'quality' of character, as a construct: how well it does what it does. For some, it is the only issue that matters.

Like any artist, I naturally want to create the characters at the heart of `knole` to a high degree of 'quality': however, I also want to consider the very nature of that 'quality' itself. I have found it under the anchoring influence of audience reception theory, a general narratological discourse which honours the one universal constituent of all characters, and all narratives, regardless of medium, school or purpose: the audience's imagination. Above all, a character's 'quality' is directly tied to the extent to and manner in which it communicates with the imaginative faculties of its audience. I call this 'quality' resonance, and it provides an (admittedly imperfect) evaluative lemma for my artistic process. As an artist, it the nature of my character's resonance that will be judged, above all else, and which I must concern myself with.

* * * * * *

A constitutive part of this resonance are the tools used to facilitate it: the medium, mode or 'media ecology'[49] in which characters are constructed. Such variable tools, materials and processes, alongside their attendant cultures, institutions and constraints, are the primary reason that resonance is such a tricky concept to define concretely: they are not 'neutral vessel[s]'[50] for a unanimous process, but shape it uniquely, and the characters that they represent. As Marshall McLuhan determined over fifty

48 Wolf, Werner 'Aesthetic Illusion'. *In:* Wolf, Werner *et al. Immersion And Distance: Aesthetic Illusion in Literature and Other Media.* Amsterdam: Rodopi, 2013.
49 Goddard, Michael. 'Media Ecology' *In:* Ryan, Marie-Laure *et al. The John Hopkins Guide To Digital Media.* Baltimore: John Hopkins University Press, 2014, p. 331.
50 Parry, Ross *Museums In The Digital Age*. Oxon: Routledge, 2010, p. 226.

years ago, 'the medium is the message'[51], and defines the communication between audience and work.

For knole my media, and the resonance they can produce, are perhaps the most important part of my enquiry. As an installation artwork, Project knole does not represent Anne and her familiar's narrative through any one medium: in fact, it is a multimodal collection of works collected to a certain extent transmedially[52], spread 'intracompositionally'[53] across several 'platforms'[54] but together forming a single 'distributed' narrative experience[55].

In ideal terms, the experience begins with the Project's website (http://bonfiredog.co.uk/knole). This serves as an initial introduction to the Project as a whole; delineating Anne's story in detail, introducing the academic contexts of the Project, and providing links to sundry other research outputs. The website also affords the visitor two major avenues for accessing the rest of the work. In the first case, it provides a download link to the 'primary sources' of pseudo-historical record: the fragmentary remnants of ballads, court proceedings, Anne's written correspondence and the 'receipts', or spells and recipes, by which she performed her duties as 'cunning woman'. Compiled together they form a text (hereafter referred to as the *Housekeeping*) that may be read at the visitor's leisure, and which provides its own, independent narrative insight into the Project's 'storyworld'[56], using a variety of unorthodox literary techniques including the epistolary form, transtextuality[57] and the instructional mode.

The website also permits the visitor to sign up for email alerts about the Project, and it is through these alerts that they are invited to visit the installation proper, at one of its public appearances. It is a touring installation, and during my PhD has been resident at the Museum of

51 McLuhan, Marshall *Understanding Media: The Extensions Of Man*. Massachusetts: The MIT Press, 1994.
52 Ryan, Marie-Laure *Narration In Various Media*, 2014 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/narration-various-media [Accessed: 18th August 2018].
53 Dena, Christy *Transmedia Practice: Theorising the Practice of Expressing a Fictional World across Distinct Media and Environment*. [PhD dissertation], University of Sydney, 2009.
54 Jenkins, Henry *Yes, Transmedia HAS a History! An Interview with Matthew Freeman (Part Two)*, 2017 [Online]. Available at: http://henryjenkins.org/blog/2017/01/yes-transmedia-has-a-history-an-interview-with-matthew-freeman-part-two.html [Accessed: 18th August 2018].
55 Walker, Jill 'Distributed Narrative: Telling Stories across Networks'. *In:* Consalvo, Mia *et al. Internet Research Annual 2004.* Brighton: Peter Lang, 2004.
56 Ryan, Marie-Laure, 2013.
57 Genette, Gérard. *The architext: an introduction*. Berkeley: University of California Press, 1992, p.83-84

Witchcraft and Magic in Boscastle, Cornwall (see Appendix 4). For my examination, the work will be resident at Corsham Court in Wiltshire, Bath Spa University's postgraduate campus, and there is scope for other installations elsewhere.

The installation itself draws on the increasing popularity in heritage interpretation of 'interactive... immersion exhibits'[58]; themselves inspired by examples of interactive and reactive digital installation art in gallery settings and digital visitor attractions.[59][60][61][62] Having visited the Project's website and read large sections of the *Housekeeping*, the visitor can now approach and enter a sparse recreation of Anne's kitchen: the locus of her personal, historicised universe and its 'mundane horrors'. Dark, damp and lit only by (LED) candles, all that remains of her physical presence are a few accoutrements of the 'cunning craft' (some bottled liquids, a string of horseshoes, a Book of Common Prayer) and a magic circle chalked on the flagstones in front of a dark wall. Up that wall, a crack runs wide and nearly a metre high: far larger than when Anne first discovered it on that wet day in 1758.

Everything about this minimalist space, the *Housekeeping* and the Project's other outputs are designed to contextualise and support what lies inside that crack: a digital simulation of Anne's 'spyrit', an artificially-intelligent and interactive character rendered as a virtual agent[63]. Drawing on the principles of mixed reality (or, as Bolter insists, 'augmented virtuality'[64]) to build the visitor's physical circumstance into the experience, the virtual 'spyrit' is reactive to presence and certain physical actions; relying on three cameras, a microphone and a touchscreen to detect vocal volume, specific phrases, movement, faces, emotions and touch input. These inputs (and others) are supported by the use of well-established artificial intelligence techniques, including a behavioural model based on

58 Pennisi, Lisa *et al.* 'Can an Immersion Exhibit Inspire Connection to Nature and Environmentally Responsible Behavior?' *Journal of Interpretation Research* 22 (2), 2017 [Online] Available at: https://www.interpnet.com/NAI/nai/_publications/JIR_v22n2_Pennisi.aspx [Accessed 18th August 2018].

59 Campbell, Jim *Jim Campbell Portfolio*, 2017 [Online]. Available at: http://www.jimcampbell.tv/portfolio/installations/ [Accessed 18th August 2018].

60 Goldberg, Ken *The Whole Cinemagillah.* National Museum of Jewish History, Pennsylvania, 2017.

61 Cardiff, Janet *To Touch,* 1993 [Online]. Available at: http://www.cardiffmiller.com/artworks/inst/totouch.html# [Accessed: 18th August 2018].

62 Birchall, Danny.

63 Russell, Stuart and Norvig, Peter *Artificial Intelligence: A Modern Approach.* Boston: Pearson, 2009, p. 31.

64 Bolter, Jay David 'Augmented Reality'. *In:* Ryan, Marie-Laure *et al. The John Hopkins Guide To Digital Media.* Baltimore: The John Hopkins University Press, 2014, p. 30.

the work of Joanna Bryson at the University of Bath[65] and a simple emotional/conceptual model that is a hybrid of several different approaches[6667].

Such technical features, in tandem with the physical and textual elements of the work entire, define the narrative experience of the visitor with the installation (hereafter referred to as `masterbeast`, after an early name for the simulation's executable file which has, unfortunately, stuck). Their encounter with the 'spyrit' as a fictional character, as a historically-representative presence, while not unmediated, is certainly immediate: through interfaces of gesture, touch, facial expression, movement, voice and manipulation of physical objects they interact with the 'spyrit' mimetically, experiencing its real-time reactions to their presence and actions with a speed and intimacy which is the hallmark of interactive virtuality. However it is the *Housekeeping*, Anne's book of spells and recipes, which serves as the primary guide for this arguably multi-linear experience. Most of Anne's recipes require the use of the creature either as an assistant, source of rare ingredients or a magical 'interface'; as mechanistic a relationship as that between Anne and the machine she operated at Elijah Knole's mill. For everything from staving off pregnancy to curing headaches, the creature's role as magical familiar, confidante and reliable mechanism is paramount. Visitors can follow Anne's instructions with the `masterbeast` themselves, if they wish, or instead explore around them; perhaps treating the creature with kindness and interpersonality, or experimenting with how its resistances and idiosyncrasies, its traumas and memories, and its reactions to the individual components of the rituals - the cutting of flesh, the speaking a particular auspicious words or the offering of a token object – illuminate some of the more subjective, secret and complex elements of Anne's psyche; those subjective, emotional conflicts and perspectives that are important to historical understanding, but so often lost to the record.

The installation in all its elements, from the 'public and private [textual] expression' of the *Housekeeping* to the 'material culture of magical

65 Bryson, Joanna J. *Behaviour Oriented Design (BOD),* 2013 [Online]. Available at: http://www.cs.bath.ac.uk/~jjb/web/bod.html [Accessed 18th August 2018].

66 Novikova, Jekaterina and Watts, Leon *A Design Model of Emotional Body Expressions in Non-humanoid Robots*. Japan: HAI, 2014.

67 Bryson, Joanna J and Tanguy, Emmanuel. 'Simplifying the Design of Human-Like Behaviour: Emotions as Durative Dynamic State for Action Selection'. *International Journal of Synthetic Emotions* 1 (1) 2010, pp. 1–21.

actions' performed[68], is designed to provoke within the visitor some measure of resonance: to communicate to their imaginations the 'spyrit' and Anne (*in absentia)* as both subjective beings and representatives of a complex of 'personal, social and cosmic environments'[69] which have direct relevance to their lives today.

* * * * * *

The masterbeast forms the thematic, material and methodological navel of the entire knole experience. The *Housekeeping*, and the other materially-disparate elements, are augmentative of it, and are employed in support of it; and at the centre of the installation itself sits the computational simulation of Anne's 'spyrit'. In considering the resonance of characters in specific media it is this computational character, and the mode of narrative computational art, which concern me the most. The term 'computational art' is a nominal one; referring to a general aesthetic tradition, outside of specific technologies or fields, which has 'fall[en] in the cracks between artistic... and academic disciplines' and 'transcend[ed] several forms'[70], with 'no agreement' how best to delineate its core qualities and member artefacts.[71] I could have instead employed the term new media[72], interactive art, digital art[7374], or any other number of terms, but I have found all of them lacking in their own ways. New media is an 'historically relative'[75] and 'qualitative... changing'[76] term; 'digital' and 'interactive' are equally heterogeneous, and 'have rarely been defined' in any satisfyingly rigorous manner[7778]; the roboticist Penny goes as far as to term them 'decidedly quaint'[79]. I instead choose to call Project knole an example of computational art (or, hereafter for ease, 'comp-art') because

68 *Inner Lives Project: Histories From Within*, 2018 [Online].
69 Ibid.
70 Koenitz, Hartmut *et al.* 'The Myth of 'Universal' Narrative Models: Expanding the Design Space of Narrative Structures for Interactive Digital Narratives'. *In:* Rouse, Rebecca *et al.* (*eds.*) *The Proceedings of the 11th International Conference on Interactive Digital Storytelling*. Ireland: Springer, 2018, pp. 107 – 120 , p. 109.
71 Simanowski, Roberto. 'Digital And Net Art' *In:* Ryan, Marie-Laure *et al. The John Hopkins Guide To Digital Media*. Baltimore: The John Hopkins University Press, 2014, p.133.
72 Manovich, Lev. *The Language of New Media.* Massachusetts: The MIT Press, 2001.
73 Simanowski, Roberto, 2014, p. 133.
74 Paul, Christiane *Digital Art*. London: Thames and Hudson, 2015.
75 Marvin, Carolyn *When Old Technologies Were New: The Emergence of Modern Communications in the Late Nineteenth-Century*. New York: Oxford University Press, 1988, p. 3.
76 Pressman, Jessica. 'Old Media/New Media'. *In:* Ryan, Marie-Laure *et al. The John Hopkins Guide To Digital Media.* Baltimore: The John Hopkins University Press, 2014, p. 365.
77 Paul, Christiane, 2015.
78 Mechant, Peter and Van Looy, Jan 'Interactivity'. *In:* Ryan, Marie-Laure *et al. The John Hopkins Guide To Digital Media*. Baltimore: The John Hopkins University Press, 2014, p. 304.
79 Penny, Simon 'Robotics and Art, Computationalism and Embodiement'. *In:* Herath, Damith *et al. Robots And Art: Exploring An Unlikely Symbiosis*. Singapore: Springer, 2016, p. 51.

the term more precisely speaks to the 'prototypical qualities' that such works share, and the modes by which they communicate their significances.[80] As Penny delineates, this is the quality of 'deploy[ing]... real-time computational tech and techniques for cultural purposes'[81], most commonly through the use of an 'electronic computational device'[82] which 'calculate[s]'[83] and presents, according to sets of programmed instructions, the manipulation and generation of information or digitally-represented 'data'.[84]

Of course, 'computational' is not a perfect term. Defined as a general process of calculation, of change resultant from the operation of some ruleset, it is not unique to modern digital technology; indeed, the term 'computer' originally applied to human workers[85]. Some non-digital artforms, such as improvisational theatre[86], Oulipan literature[87] and tabletop roleplaying[88], are strictly computational with rulesets of varying determinacy. However, the term is now so naturalised to digital technology that I feel that it can usefully serve in this thesis to collectively denote a particular sort of narrative art: artworks such as `knole`'s digital installation[89], videogames, 'interactive digital narrative'[90], mixed and augmented reality art and interpretation[91][92],"interactive... historical character-based event representations"[93] and many others, whether

80 Thon, Jan-Noel 'Mediality'. *In:* Ryan, Marie-Laure *et al. The John Hopkins Guide To Digital Media*. Baltimore: The John Hopkins University Press, 2014, p. 334.
81 Penny, Simon, 2016, p. 47.
82 Galloway, Alexander R *Gaming: Essays in Algorithmic Culture.* London: University of Minneasota Press, 2006.
83 Stevenson, Angus *Oxford Reference: Computation*, 2010 [Online]. Available at: http://www.oxfordreference.com/abstract/10.1093/acref/9780199571123.001.0001/m_en_gb0169140 [Accessed: 18th August 2018].
84 Fuller, Matthew 'Data'. *In:* Ryan, Marie-Laure *et al. The John Hopkins Guide To Digital Media*. Baltimore: The John Hopkins University Press, 2014, p. 125.
85 Grier, David Alan. *When Computers Were Human.* Oxford: Princeton University Press, 2005.
86 Frost, Anthony and Yarrow, Ralph *Improvisation in Drama, Theatre and Performance: History, Practice, Theory*. London: Palgrave Macmillan, 2007.
87 Matthews, Harry and Brotchie, Alastair *Oulipo Compendium*. London: Atlas Press, 2010.
88 Bowman, Sarah Lynne *The Functions of Role-Playing Games: How Participants Create Community, Solve Problems and Explore Identity*. North Carolina: McFarland and Company, 2010.
89 Mondloch, Kate 'Digital Installation Art'. *In:* Ryan, Marie-Laure *et al. The John Hopkins Guide To Digital Media*. Baltimore: The John Hopkins University Press, 2014.
90 Koenitz, Hartmut 'Towards a Specific Theory of Interactive Digital Narrative'. *In:* Koenitz, Hartmut *et al.* (*eds.*) *Interactive Digital Narrative: History, Theory and Practice*. London: Routledge, 2015.
91 Benford, Steve and Giannachi, Gabriella *Performing Mixed Reality*. Massachusetts: The MIT Press, 2011.
92 Papaefthymiou, Margarita *et al.* 'Gamified AR/VR Character Rendering and Animation-Enabling Technologies'. *In:* Ioannides, Marinos *et al. Mixed Reality and Gamification for Cultural Heritage*. London: Springer, 2017.
93 Magnenat-Thalman, Nadia and Papagiannakis, George 'Recreating Daily Life In Pompeii'. *Virtual Archaeology Review* 1 (2), 2010, pp.16 – 20, p. 16.

deployed for purely aesthetic reasons or as examples of 'digital' or 'virtual' heritage interpretation[9495].

* * * * * *

The creation of any sort of resonant character is no easy task. It requires skill, deep thought and an understanding of both the media employed and the audience addressed. Arguably, the computational mode is one of the newest (though perhaps no longer actually *new*) toolsets available to artists; and equally arguably remains the most difficult to employ. Resonant characters in comp-art - characters which both use the potentials of the mode and fulfill their duties to the constructive mental and physical engagement of the audience – remain, I argue, the exception rather than the rule. Their most basic elements are still regularly debated at high-profile conferences[96], jeremiads both popular[97] and academic[98] written lamenting their failings; sometimes even their need to exist is questioned[99]. Project `knole`, as an example of computational characterisation, represents my own small contribution to this torrid field. Rather than exemplifying cutting-edge technologies, novel algorithms or new subject matter, the Project instead tries to approach this issue laterally. It tries to create resonance by returning to the first principles of all the elements so far discussed – the human imagination, character, narrative, aesthetic and so on – and combine them with the systemic qualities that lie at the heart of the computational mode to delineate an interdisciplinary theoretical methodology which I call the autocosmic. This thesis explains and contextualises this methodology, and demonstrates how I used it in Project `knole` to create at least two resonant computational characters; the 'spyrit' represented bodily and procedurally, and Anne; long-gone, but still present in the evidence of her influence throughout this closetted little mental and physical realm, of which she was architect and mistress.

94 Champion, Erik 'Defining Cultural Agents for Virtual Heritage Environments'. *Presence* 24 (5), 2015, pp.179 – 186.
95 Champion, Erik 'Introduction to Virtual Heritage' *In:* Gillam R. And Jacobson, J. *(eds.*) *The Egytian Oracle Project: Acient Ceremony in Augmented Reality*. London, Bloomsbury, 2015, pp.
96 Koster, Raph *et al. AI Wish List: What Do Designers Want out of AI?* San Francisco: Game Developer's Conference, 2018.
97 Bogost, Ian *Video Games Are Better Without Characters*, 2015 [Online]. Available at: https://www.theatlantic.com/technology/archive/2015/03/video-games-are-better-without-characters/387556/ [Accessed 18th August 2018].
98 Tence, Fabian *et al.* 'The Challenge of Believability in Video Games: Definitions, Agent's Models and Imitation Learning'. France: UEB, 2010.
99 Bogost, Ian, 2015.

The Project is only one example of this autocosmic methodology. It is not the end of the matter: instead, it encourages wider thought, across disciplines, about the role of characters (persons, *figures*) in our lives, and what they are trying to communicate. Anne's world is, in many ways, much like our own; populated by a variety of persons whether supernatural, natural, alive, long-dead or imagined, with which we regularly commune. This ancient drive to mentally socialise, which has only been exacerbated by modern technology, demonstrates a way forward. By considering it in the following broad fashion, new resonant ways of using the computational mode – one defined by interactivity, procedurality and the simulation of complex systems – become possible, allowing us to better represent the complex, systemic doings of persons across worlds both current, imaginary and historical, real and constructed, however we choose to mediate them, and to whatever ends they might serve.

1

"Hollow Forms"

Defining Fictional Characters, Resonance, 'Aesthetic Illusion' *and the Autocosmic*

Précis

This chapter contextualises some of the major concepts of this thesis – fictional characters, their 'qualities' and the mechanisms by which audiences engage with them – within existing narratological frameworks, most notably audience reception theory. In particular, it considers the nature of imaginative audience response to character, and draws on recent interdisciplinary work between the arts and sciences to necessarily expand the narratological conception of the imagination: the heart of the autocosmic methodology which I apply to my own characters.

Section 1.1: A Definition Of Fictional Character

Before discussing my work on `knole` specifically, a general, 'medium-transcending'[100] definition of the term 'fictional character' is required. This is for three major reasons. It allows me to consider what is common to all characters, regardless of their implementation. By defining what a character is, the boundaries of my methodology – how a character is created, what is created, and how that creation should be received and understood – are set clearly and definitively. Finally, the task pays heed to the fact that the term, despite a seeming commonality and naturalisation in everyday discourse, 'has shifted over time and... remains highly ambiguous'[101], exposed to the vogues and pecadilloes of literary movements, philosophical discourse and wider social contexts[102]. As I am primarily considering the *practice* of creating character, my definition pays most heed to those discrepancies in the discourse that relate to that practice: namely, what it is I am constructing when I construct a character, and the processes underlying that construction.

100 Ryan, Marie-Laure, 2014.
101 Kennedy 2010
102 Bradbury 2006

The extant debate on the nature of character originates in the dramatic and civil culture of Ancient Greece and Aristotle's concept of *ethos* [103][104], and continues today in what Keen identifies as a fundamental split in the conception of character between the 'naive engagement'[105] of audiences, the more detached critique of scholars such as the American New Critics[106], Russian Formalists[107]and certain feminist rhetorics[108][109][110], and that of other scholars hanging somewhere in between. For many formalist and structuralist thinkers, characters are not interrogable wholes: they are merely 'humanised outcropping[s]... of some larger verbal design'[111], 'clusters of... semes'[112] perceived as structural patterns, as 'functional categor[ies]'[113] , as 'effect[s] created'[114] within an integrated creative construct. To speak about the creation of a character as the creation of a discrete individual, for such scholars, 'survives only in vestigial form... [as] an anachronism'.[115]

This position, while less popular today, and riven with semantic disagreements[116], still has much to offer for practical consideration: particularly when it comes to considering characters as artificial constructs rather than real people. The fact of mediation is not the key here: real historical figures, unknown to us directly through the senses, must also be mediated through some 'discourse'[117] or 'text'[118], in the general sense[119]. It is a fact that Anne comments upon directly, lamenting how many of her contemporaries have never come to visit with her 'spyrit', instead choosing to read about her through the rumour-mills of the popular press, with some even considering her 'spyrit' a 'thyng of papre onlie'. Of course, while avoiding the more objective, abstract debates on the philosophical and

103 Felski, Rita. 'Introduction'. *New Literary History*, 42 (2), 2011, pp.v-ix, p. v.
104 Aristotle, *Poetics*. London: Penguin Classics, 1996.
105 Keen, Suzanne 'Reader's Temperaments and Fictional Character'. *New Literary History* 42 (2), 2011, pp.295 – 314, p. 295
106 Richards, Ivor Armstrong *Practical Criticism*. London: Kegan Paul, Trench, Trubner, 1930.
107 Propp, Vladimir *Morphology of the Folktale*. Texas: University of Texas Press, 1968.
108 Scheiber, Andrew "The Arm Lifted against Me': Love, Terror and the Construction of Gender in "Wieland"'. *Early American Literature* 26 (2), 1991, pp. 173-194.
109 Cixous, Helene 'The Character of "Character"'. *New Literary History* 5 (2), 1974, pp. 383-403.
110 Thomasson, Amie *Fiction and Metaphysics*. Cambridge: Cambridge University Press, 1999.
111 Bradford, 2006
112 Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions', p. 107.
113 Ibid, p. 107.
114 Jannidis, Fotis *Character*, 2013 [Online]. Available at: http://wikis.sub.uni-hamburg.de/lhn/index.php/Character [Accessed: 18th August 2018].
115 Felski, Rita, 2011, p. v.
116 Ryan – 'cannot agree on basic units of narrative'
117 Alexander, Marc and Emmott, Catherine 'Schemata'. *In:* Huhn, P. *Handbook of Narratology*. Berlin: De Gruyter, 2014.
118 Lotman, Yuri, 1977.
119 Kroon, Fred *et al. Fiction: The Stanford Encyclopedia of Philosophy*, 2011 [Online]. Available at: https://plato.stanford.edu/archives/win2016/entries/fiction/ [Accessed: 18th August 2018].

semantic reality of fictional characters[120][121][122][123] as beyond practical use, fictional characters necessarily are 'of papre'. They have no separate objective existence, and never did: they are formally mediated in some manner, rather than translated from a biological reality. As such, they remain, given the 'focalization', as Gerard Genette has it[124], of mediated narratives – in which 'many or even most of the details [of a character's life] are omitted'[125] - 'radically incomplete'[126]. A fictional character, as an artificial construct, cannot be interrogated as an objectively complete individual[127][128]: this is not a deficiency, but an important part of their very nature. It is certainly true of Anne and her 'spyrit': even in computational simulation (and as shall be explored in Chapter 2), the creature is never given anything but the barest features compared to the analogue complexity of a 'real' creature of its ilk.

However, this strictly formalist approach, focussing on objective reality above all else, ignores much of the subjective truths of fictional character, and indeed often actively denies it[129][130] as 'naive' or 'unruly'[131]: the 'commonsensical' preserve of untrained response[132][133]. However, this subjectivity lies at the heart of any artist's methodology: considering not only what a character is materially, but also why characters are created, and how they, as constructed objects, pursue this purpose. As 'textual' creatures, constructed and mediated, characters are objects that are designed to be 'read' in some manner: to communicate or serve as the catalyst for some significance[134].

120 Friend, Stacie 'Fictional Characters'. *Philosophy Compass* 2 (2), 2007, pp.141-156.
121 Kroon, Fred *et al.* 2011
122 Ryan on ontological and logical status of ccters
123 Lewis possible worlds
124 Genette, Gérard 'Discours du récit'. *In: Figures III*. Paris: Seuil, 1972.
125 Niederhoff, Burkhard *Focalization*, 2013 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/focalization [Accessed: 18th August 2018].
126 Margolin, Uri, 1987, p.108.
127 Wolf, Werner 'Aesthetic Illusion as an Effect of Illusion'. *German Narratology II* 38 (3), 2004, pp. 325 – 350.
128 Mar, Raymond and Oatley, Keith, 2008.
129 Wimsatt, W.K. and Beardsley, Monroe 'The affective fallacy' .*Sewanee Review* 57 (1), 1949, pp. 31 – 55.
130 Wimsatt, W.K. and Beardsley, Monroe 'The intentional fallacy'. *Sewanee Review* 54 (3), 1946, pp. 468-488.
131 Keen, 2011, p. 310.
132 Ryan, Marie Laure 'Kinds of Minds: On Alan Palmer's "Social Minds"'. *Style* 45 (4), 2011, pp. 654 – 659.
133 Caracciolo, Marco 'Narrative Space and Reader's Response to Stories: A Phenomenological Account'. *Style* 47 (4), 2013, pp. 425 – 444.
134 Phelan, James 'Rhetorical Narratology'. *In:* Herman, David *et al.* (*eds.*), pp. 500 – 504.

Therefore throughout this thesis I return to academic sources which place such communication, such an 'unpredictable afterwards'[135] beyond the formalist concrete, at the heart of their discourse on character: part of a paradigmatic shift across the humanities, particularly in narratology and literary theory, towards what have been called 'post-classical' positions[136][137][138]; arising from the phenomenological, post-structural and postmodern tendencies of twentieth century thought[139][140]. It is a term which narratologists such as Meir Sternberg[141] dislike because of its imprecision and sublimation of opposing theoretical boundaries: despite this, it serves a useful purpose to delineate a trend in those disciplines which influence my definition of character.

This trend, in terms of character, has manifested in a 'sudden revitalisation' in the 'once moribund'[142] field of 'character-focussed criticism'[143]; in which narrative, plot, and the other structural considerations of artworks such as `knole` have been reconfigured as subservient to what Martinez-Bonati calls 'the world of individuals'[144], and the work of the narrative artist defined as the 'singl[ing] out [of] existents'[145], 'autonomous intentional agents and their interactions'[146][147]. Narratology thus becomes less about the 'texts' themselves, and far more about what those 'texts' communicate: in this case, an experience of individualised beings. In particular, scholars frame this in terms of two important subjective contexts: the experience of the artist creating the character, and the experience of the audience who encounters it.

To investigate the importance of the audience's experience in defining and conceiving fictional characters, like many scholars before me I observed the discussions of a monthly book group as part of my PhD (see

135 Ibid, p. 300.
136 Mani, Inderjeet *Computational narratology,* 2013 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/computational-narratology [Accessed 18th August 2018].
137 Koenitz, Hartmut *et al.* 'Introduction: Perspectives On Interactive Digital Narrative'. *In:* Koenitz, Hartmut *et al.* (*eds.*), 2015, pp. 1 - 8, p. 4.
138 Thon, Jan Noel 'Narrativity'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, p. 351 – 355.
139 Cite (Westphal?)
140 cite
141 Sternberg
142 Felski, Rita 2011, p.v.
143 Currie, Gregory 'Narrative and the Psychology of Character'. *The Journal of Aesthetics and Art Criticism,* 2009, pp. 1 – 12, p. 61 – 71, p. 61.
144 Martinez Bonati, Felix *Fictive Discourse and the Structures of Literature: A Phenomenological Approach.* New York: Cornell University Press, 1981, p. 3.
145 Ryan, Marie-Laure, 2014.
146 Mar, Raymond A. and Oatley, Keith, 2008, p. 3.
147 Roser, Nancy *et al.* 'Characters As Guides To Meaning'. *The Reading Teacher* 60 (6), 2007, pp. 548 – 559.

Appendix 1). Here I found, as studies before mine confirm, a 'profound... meeting of minds'[148] between readers and characters, 'troubled creatures' distinct and interrogable, as one group member called them, rather than merely between a reader and the text. The participants may have begun their discussions in terms of the character's 'determined context'[149] of the novel, but soon they were dislodged and playfully entered into a new, subjunctive space by the group's collective and individual imaginations, 'escap[ing] the boundaries of the text itself' [150]. Their discussion of Rose Tremain's *The Road Home*[151] took the Eastern European protagonist and placed him into alternate narratives, situations 'separate... from [their] surrounding fictional determinants'[152]. Disagreements flared about what characters looked like, the group burnishing their forms in debate and accord; whether 'Jasmina with the coloured glass' wore heavy, thick jewellery, or whether the protagonist's mother dressed all in black. For these readers, and for those in past studies (see Appendix 1), the pleasures of experiencing narrative art was the concretisation of the individual, interrogable persons who lay at their centres: each an 'entire self'[153] which, through what Lewis calls 'perdurance'[154], can be distinguished and discussed as 'itinerant individuals'[155] above and beyond their 'text'.

Perhaps most fundamentally the post-classical position, paired with my observations of audiences, is in direct concord with my own subjective experience as an artist creating characters. My artistic process in creating `knole` is not easily unpicked, or categorised. To say whether the plot or the characters or the setting came first is a useless question: each element informed and interpenetrated the others recursively, and any 'genealogy of method' is (and I suspect is for all artists) impossible. However, what is certainly true subjectively is that Anne, her 'spyrit' and the other individuals of the Project's storyworld have always possessed, to my mind, this 'perdurance' of which Lewis writes. They have never been cold constructs to me, or indistinguishable elements of some detached,

148 Mar, Raymond A. *et al.* 'Exploring the link between reading fiction and empathy: Ruling out individual differences and examining outcomes'. *Communications* 34, 2009, pp. 407-428, p. 3.
149 Bradbury, 2006
150 Keen, Suzanne, 2011, p. 299.
151 *Tremain, Rose The Road Home.* London: Vintage, 2009.
152 Bradbury 2006
153 Gibson, Walker 'Authors, Speakers, Readers, and Mock Readers'. *College English* 11, 1950, pp. 265 - 269.
154 Lewis, David Kellogg *Counterfactuals.* Harvard: Harvard University Press, 1986.
155 Margolin, Uri 'Individuals In Narrative Worlds: An Ontological Perspective'. *Poetics Today* 11 (4), 1990, pp. 843 – 871, p. 864.

structuralist exercise. Since the very beginning they were 'coherent entities'[156], 'non-actual individual[s]... endowed with inner states, knowledge and belief sets, memories, attitudes and intentions'[157], even if those qualities were not fully delineated. This admission is not only definitionally important, but also methodologically. To know Anne and her 'spyrit' as beings, instinctively, was important to the development of their narratives: without knowing of them as people, conceptually, the telling of their story would have been impossible, even if this personhood was in (as far as I perceived) a state of flux almost until the last day of working.

The combination of these three insights – personal, observational and academic – leads inevitably to a 'character-focussed'[158] definition. To define fictional character I must not only honour its material, formal origins but also its subjective reality to those with whom they communicate through their very existence: the heart of character as a procedural artefact. As fictional characters, Anne, her 'spyrit' and every other denizen of `knole`'s 'storyworld'[159] are examples of 'non-actual'[160], individual persons, partially mediated within a system of representation, and extrapolated into a more complete personhood through the necessary perceptions and imaginative processes of their audience. It is their represented and imagined actions, personality, behaviours, relationships and very nature which constitutes both implicit and explicit narrative.

156 Laurel, Brenda *Computers as Theatre.* Boston: Addison-Wesley, 1993, p. 3
157 Margolin, Uri, 1990, p. 844.
158 Currie, Gregory, 2009, p. 61.
159 Ryan, Marie-Laure, 2013.
160 Margolin, Uri, 1987, p. 3.

Section 1.2: Defining The Qualities, or Resonance, of Character

The strength of the definition above is its methodological focus. It contains implicit within it the central challenge of my practice, and indeed the practice of any narrative artist: the construction of characters as communicative tools of expression. Like any practice with a set of objectives, the creation of character is subject to extensive self-reflection, theorising and criticism by numerous attendant cultures and ontologies, from the academy to the 'naive' discourses of 'ordinary'[161] audiences: all concerned with how, and to what extent, it meets those objectives *through* practice. Generally this is considered the preserve of aesthetics, as a discipline – the 'concern with what art does'[162], and how it does it, manifesting in 'judgements of relative value [and] evaluation'[163]. We might, imprecisely and broadly, term this evaluation a search for the 'quality' of the practice, or the 'quality' of the character thus constructed.

What this 'quality' might be, in any general sense, proves harder to define. A review of the literature across many relevant critical fields – from literary theory to narratology to museum studies – yields a striking array of measures. Variously, 'quality' characters and their narratives are defined as 'evocative'[164], 'provo[cative]'[165], 'sympath[etic]'[166], 'enduring'[167], 'vivid'[168] 'memorable'[169], 'rich'[170], 'engaging'[171], 'transporting'[172] and – my personal favourite – possessing of some sort of 'Gee Whiz' factor[173]. My studied reading group offered similar definitions of 'believability', 'well-drawedness' and 'plausiblity'; of behaving 'realistically', of avoiding 'clunkiness' and the treatment of characters as mere 'devices'. Visitors to test installations of `knole` held throughout my PhD (see Appendix 5) were

161 Keen, Suzanne, 2011, p.295.
162 Shinkle
163 Layton anthropology of art
164 Turkle, Sherry *The Second Self: Computers and the Human Spirit.* Massachussetts: MIT, 2005, p. 19.
165 Tilden, Freeman *Interpreting Our Heritage.* North Carolina: University of North Carolina Press, 1957, p.152.
166 Oatley, Keith 1994, p.53.
167 Murran, 2016
168 Moran, 2016
169 Boswijk, Albert *et al. The Economy Of Experiences.* Amsterdam: European Centre for the Experience and Transformation Economy, 2012.
170 Nicolopoulou, Ageliki and Richner, Elizabeth 'From Actors to Agents to Persons: The Development of Character Representation in Young Children's Narratives'. *Child Development* 78 (2), 2007, pp. 412-429, p. 412.
171 Heidibrink, Simone *et al.* 'Theorizing Religion in Digital Games. Perspectives and Approaches'. *Online Heidelberg Journal of Religions on the Internet* 5 (1), 2014.
172 Rain, Marina *et al.* 'Adult attachment and transportation into narrative worlds'. *Personal Relationships* 24 (1), 2017, pp. 49 – 74, p.49.
173 Dean, David, p.8.

similarly, and determinedly, vague: praising the 'spyrit' as 'fascinating', 'meditative' and 'reflective'. Such praise is welcomed by any artist, but it says little about the actuality to which that praise points: what 'qualities' elicit such remarks, and how they might be developed.

What unites these disparate definitions, about very different characters, is the extra-textual act of communication which takes place when those evaluative cultures 'meet' those characters in their formal manifestation. It is this act which is the key to defining, with any methodological rigour, the tenets of 'quality' character. Its most prominent delineation is in the post-classical audience reception theory[174][175][176]. While originating in classical concepts of narrative in drama and literature[177], this model has spread to cinema[178][179][180], the visual arts[181], theatre studies[182][183], exhibition design and museum studies[184][185][186] and is firmly part of the 'subjective turn' in narratology more broadly. It sites the study of narrative and character in the 'procedural tension' between the 'text' itself and the internalised subjective processes of that text's audience[187], which originates in a representative text but is not constrained by it. The theory studies how the reception of a text by the audience leads to an imaginative galvanisation and extrapolation of the source material, an 'aesthetic engagement'[188] actively constructing the characters into the perception of a subjective, complete personhood, a 'temporarily shared social reality'[189], subject to

174 Holub, Robert C. *Reception Theory: A Critical Introduction.* London: Methuen, 1984.
175 Iser, Wolfgang *The Act of Reading: A Theory of Aesthetic Response*. Baltimore: The John Hopkins University Press, 1978.
176 Jauss, Hans Robert *Toward an Aesthetic of Reception.* Minneapolis: University of Minneasota Press, 1982.
177 Prince, Gerald *Reader*, 2013 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/reader [Accessed: 8th August 2018].
178 Hirschman, Elizabeth C. 'Applying Reader-Response Theory to a Television Program'. *Advances in Consumer Research 26*, 1999, pp. 549-554.
179 Turvey, Malcolm 'Seeing theory: on perception and emotional response in current film theory'. *In:* Allen, Richard and Smith, Murray (eds.) *Film Theory And Philosophy*. Oxford: OUP, 1997, pp. 431 – 457.
180 Kratka, Jana 'The Relation between a Viewer and the Fictional Character in Light of his Activity, Reflection and Experiential Learning'. *The International Journal of Learning* 16 (6), 2009.
181 Bal, Mieke *Reading Rembrandt: Beyond The Word-Image Opposition.* Amsterdam: Amsterdam University Press, 2006.
182 Laurel, Brenda *Computers as Theatre.* Boston: Addison-Wesley, 1993.
183 Bennett, Susan *Theatre Audiences: A theory of production and reception.* London: Routledge, 1997.
184 Heath, Christian and vom Lehn, Dirk 'Configuring Reception: (Dis-)Regarding the 'Spectator' in Museums and Galleries'. *Theory, Culture and Society* 21 (6), 2004, pp. 43-65.
185 Meisner, Robin *et al.* 'Exhibiting Performance: Co-participation in science centres and museums'. *International Journal of Science Education* 29 (12), 2007, pp. 1531 – 1555.
186 Crane, Susan A. 'Memory, Distortion and History in the Museum' *In:* Carbonell, Bettina Messias *ed. Museum Studies: An Anthology of Contexts*. Oxford: Wiley-Blackwell, 2012.
187 Iser, Wolfgang 'The Reading Process: A Phenomenological Approach'. *New Literary History* 3 (2), 1972 PP.279 – 299, p. 298.
188 Berleant
189 Rommetveit, Ragnar 'Outlines of a Dialogically Based Social-Cognitive Approach to Human Cognition and Communication'. *In:* World, Astri Heen (eds.) *The Dialogical Alternative: Toward a Theory of Language and Mind.* Oslo: Scandanavian University Press, 1992.

many individual, 'culturally and temporally specific'[190] influences. These include the audience's personal 'story schemata'[191] and 'media knowledges'[192] of the particular forms and narrative techniques employed, fostered particularly by 'metaleptical' techniques which 'reach... across levels' of the mimetic representation, and paradoxically strengthen its power by pointing out its artificiality[193][194][195]. It is influenced by the audience's personal emotions and memories[196], their temperaments[197], 'identities'[198], personal 'schemas' of information about the world[199]; by any 'interpretative communities'[200] of which they may be a part.

It is this development of character, arising to a mutual act of communication between 'text' and audience, which is the overriding arena within which the 'quality' of any character may be created or judged. The static artefact produced by the artist – what Kuzmicova calls the 'text' factor'[201] - is part of a larger, executive process, a 'reader' and 'situation factor'[202], where work 'only comes to life'[203]. No matter the tools, traditions, approaches or objectives of the artist creating character, it is the nature and quality of this communication with the audience's imagination which must ultimately concern them. Without it, their material efforts would be in vain, for without communication, or a certain quality of communication, a character (by my earlier definition) cannot function, or even exist. This 'quality', being the focus of my study, needs a more definitive term: in the lack of any existing standard, I will be calling it resonance throughout this thesis, underlining it to denote its nominal nature. It is a word that has certain, useful, metaphorical connotations: connotations of potential, echo,

190 Alexander, Marc and Emmott, Catherine, 2014.
191 Rumelhart, David E. 'Notes on a Schema for Stories'. *Representation & Understanding* (1975), pp.211 – 236, p. 211.
192 Ryan, Marie-Laure, 2014.
193 Ryan, Marie-Laure *Avatars of Story*. Minnesota: University of Minnesota Press, 2006, p. 206.
194 Benford, Steve and Giannachi, Gabriella *Performing Mixed Reality*. Massachusetts: The MIT Press, 2011, p.
195 Sontag, in Keogh
196 Miall, David S. 'Anticipation and feeling in literary response: A neuropsychological perspective'. *Poetics* 23 (1), 1995, pp.275 – 298.
197 Keen, Suzanne, 2011.
198 Holland, Norman. *Poems In Persons: An introduction to the psychoanalysis of literature*. New York: W.W. Norton & Company, 1974.
199 Narvaez, Darcia 'The influence of moral schemas on the reconstruction of moral narratives in eighth graders and college students'. *Journal of Educational Psychology* 90 (1), 1998, pp.13 – 24, p. 13.
200 Fish, Stanley *Is There a Text in This Class? The Authority of Interpretative Communities*. Massachusetts: Harvard University Press, 1982.
201 Kuzmičová, Anežka 'Literary Narrative and Mental Imagery: A View from Embodied Cognition'. *Style* 48 (3), 2014, pp. 275 – 295, p. 280.
202 Ibid.
203 Huizinga, Johan. *Homo Ludens*. Boston: The Beacon Press, 1955, p. 165.

relay, timbre, tone and volume; elements of communication which, above all, symbolise what a character 'makes the imagination *do*'[204].

However, when applied to specific works, specific characters, such generality quickly becomes problematic. For each character – indeed, for each individual instance of a character communicating with an audience member - the nature of its resonance, and the parameters by which it can be judged, are extremely variable. There are many factors to consider, or indeed ignore, depending upon one's perspective and stake in the matter; not least *what* is being communicated. Some privilege the traditional yardstick of the author's 'communicative intention'[205], and the nature of the representative artefact by which this is yielded. This is particularly important when the artist is considered as in some sort of communication with their 'other self', as their own audience or 'first reader'[206], though remarkably few have pursued this idea in literary theory[207][208][209]. By such a measure, resonance is in part determined by an artist's own responses to their work 'before it is made, as it is made, and after it is made'[210]. Others have de-emphasised the author's personal objectives and perspectives as biased, 'highly flawed'[211] or incomplete[212], and instead favour other components: for Formalists the text[213], and for audience-response theorists, the audience themselves[214][215]. However, this 'messier' reliance upon the 'protean'[216] and ultimately unknowable mass of potential recipients has always been a thorn in audience-response theory's side[217]: a reliance upon what Dean, in considering museum audiences, calls the 'least understood' factor in developing communicative strategies[218]. Various models of audiences have been proposed, to try and outline their 'sense of

204 Moran
205 Schonert, Jorg *Author*, 2014 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/author [Accessed 8th August 2018].
206 Murray, Donald M. 'Teaching The Other Self: The Writer's First Reader'. *College Composition and Communication* 33 (2), 1982, pp. 140-147, p.140.
207 Ibid.
208 Langer, Judith A. and Flihan, Sheila 'Writing and Reading Relationships: Constructive Tasks'. *In:* Indrisano, Roselmina and Squire, James R. *Eds. Perspectives On Writing: Research, Theory and Practice.* Canada, IRA, 2000.
209 Graves, Don & Hansen, Jane. 'The author's chair'. *In:* Jensen, I.M. *eds. Composing and Comprehending*. Illinois: ERIC Clearinghouse on Communication Skills, 1984, pp. 69-76
210 Murray, Donald M, 1982.
211 Wolf, Werner, 2004, p. 326.
212 Cioffi, Frank. 'Intention and Interpretation in Criticism'. *Proceedings of the Aristotelian Society* 64 (85), 1963.
213 Wimsatt, W.K. and Beardsley, Monroe, 1946.
214 Koblizek, Tomas *eds. The Aesthetic Illusion in Literature and the Arts.* London: Bloomsbury, 2017.
215 Keen, Suzanne, 2011.
216 Ibid, p.296.
217 Schneider, Ralf 'Toward a Cognitive Theory of Literary Character: The Dynamics of Mental-Model Construction'. *Style* 35 (4), 2001, pp. 607–639.
218 Dean, David, p. 4.

engagement'[219] in the dynamic of the work-as-experienced[220][221][222][223], though their utility is often questioned[224]. The importance of unpredictable readings, 'aberrant encodings'[225], unexpected interpretations and unmodelled outcomes has been a key part of literary theory since the middle of the last century[226].

Given the subjectivity of a post-classical, 'character-focussed'[227] approach, a character's resonance can never be conclusively measured or defined: it is not a quantative gauge, but rather a complex interlock of intentions, responses and predispositions lying in some emergent nexus between audience, author, context, media and the experience of the communicating act itself, depending on the current perspective and its active concerns. While others may (and indeed do) have other perspectives on my work, my perspective and my objectives as the artist are what concern this thesis, for all their potential bias. They must form the basis of the parameters by which, in this particular instance, my characters will be judged. In delineating them, I have at least attempted to consider not only my own goals and responses but the prototypical parameters by which critics, theorists and audiences approach such works; as well as remaining alive to the inevitability, and the value, of unexpected or emergent receptions of my work over which I have no control.

As such, this thesis determines the resonant objectives of the characters of Project `knole` as follows:

1) To develop and explore the historical and aesthetic themes delineated in this thesis' introduction, and those explored by the institutions (such as the Museum of Witchcraft and Magic) in which the work is installed;

219 Machidon, Octavian M. *et al.* 'Virtual humans in cultural heritage ICT: A review'. *Journal of Cultural Heritage* 33, 2018, pp. 249 – 260, p. 256.
220 Ibid.
221 Schonert, Jorg, 2014.
222 Iser, Wolfgang, 1972.
223 Booth, Wayne C. *The Rhetoric of Fiction*. London: University of Chicago Press, 1961.
224 Parry, Ross, 2010.
225 Eco, Umberto, Splendore, Paola (trans.) 'Towards a Semiotic Inquiry Into the Television Message'. *Working Papers in Cultural Studies* 3, 1972, pp.103-21, p. 103.
226 Barthes, Roland *Image-Music-Text*. New York: Hill and Wang, 1977.
227 Currie, Gregory, p. 61.

2) To communicate, in the classic goal of heritage interpretation, 'pluralistic and multiple perspectives on history'[228] which 'provoke'[229] a 'change in attitude'[230] and 'unsettle established meanings'[231] in the visitor;

3) To have my characters be experienced as complex and coherent persons in their own right;

4) To engage emotionally and intellectually with the individual perspectives of the audience;

5) To stand as 'metareferential'[232] explorations of the very concept of character itself, in conjunction with the ideas espoused in this thesis;

6) To properly and specifically use the affordances, technologies and potentials of my chosen media to pursue these goals.

228 Rahaman, Hafizur and Kiang, Tan Beng 'Digital Heritage Interpretation: Learning from the Realm of Real-World'. *Journal Of Interpretation Research* 22 (2), 2017, pp. 54 – 64, p. 58.
229 Tilden, Freeman, p. 152
230 Dean, David, p. 15.
231 Bouquet, Mary. 'Thinking And Doing Otherwise: Anthropological Theory in Exhibitionary Practice'. *In:* Carbonell, Bettina Messias *Museum Studies: An Anthology of Contexts*. Chichester: Wiley-Blackwell, 2012. p. 186.
232 Wolf, Werner 'Metareference across Media: The Concept, its Transmedial Potentials and Problems, Main Forms and Functions.' *In:* Wolf, Werner *et al. Metareference across Media: Theory and Case Studies*. Amsterdam: Rodopi, 2009, p. 31.

Section 1.3: Imagination As The Object Of Resonance

Having defined fictional character as both a constructed artefact and an act of communication with an audience's imaginative faculties, it is of further methodological necessity to consider the nature of that imagination. Above all other considerations, post-classical narratology sees imaginative engagement as the common factor in all artistic work, shared by all audiences, and a prime engine of resonance. In my practice, and the practice of all artists, it is as much a constructive tool as the media I choose to employ. Therefore a literacy in the nature of imagination, and the general processes it undertakes in reception of a narrative artwork, is vital to properly partner with it in pursuit of my resonant goals.

Since the earliest formalisations of aesthetics in Plato[233] and Aristotle[234] the importance of the imagination as a 'constructive... act'[235] in art has been explored. Numerous theories consider how mental processes of representation in audiences, what Wolf calls 'imaginative activation' by a 'text'[236], lead to resonant effects: how audiences become 'immersed'[237][238][239] or 'absorbed'[240] or 'transported' or 'involved'[241] in the lives of fictional characters; how they 're-center'[242] themselves, personally, within the perspectives of fictional others; how they empathise with, and are affected by, the lives of people who were never alive, and who are barely represented before them by words on a page, code on the screen or a collection of brushstrokes on a canvas[243].

These effects, and many others, have classically relied on an 'illusionist'[244] conception of the aesthetic imagination which may be applied to 'the reception of many representational texts', artifacts or

233 Plato, Benjamin Jowett (trans.) *Ion: The Internet Classics Archive*, 2009 [Online]. Available at: http://classics.mit.edu/Plato/ion.html [Accessed: 18th August 2018].
234 Aristotle, 1996.
235 Oatley, Keith 1999.
236 Wolf, Werner, 2011, p.9.
237 Ryan, Marie-Laure *Possible Worlds, Artificial Intelligence and Narrative Theory*. Bloomington: U of Indiana P, 1991.
238 Schaeffer, Jean-Marie. *Pourquoi la fiction?* Paris: Seuil, 1999.
239 Ryan, Marie-Laure *Narrative As Virtual Reality II: Revisiting Immersion and Interactivity in Literature and Electronic Media*. Baltimore: John Hopkins University Press, 2016.
240 Cohen, Jonathan 'Defining Identification: A Theoretical Look at the Identification of Audiences With Media Characters' *Mass Communication and Society* 4 (3), 2001, pp.245-264, p.245.
241 Green, Melanie *et al.* 'Understanding Media Enjoyment: The Role of Transportation Into Narrative Worlds'. *Communication Theory* 4 (3), 2004, pp.311-327.
242 Ryan, Marie-Laure, 1991
243 Margolin, Uri, 1990.
244 Wolf, Werner, 2004, p.326.

performances'[245], including seemingly avant-garde or deliberately illogical or non-representational works[246][247][248], and which has been perhaps most clearly defined as 'aesthetic illusion'[249]: a 'basically pleasurable mental state'[250], in which audiences, during the act of reception, 'experience the [storyworld] in a way similar... to real life',[251] as a vivid mental experience. It is a powerful and complex procedure, in which a multi-faceted mental construct of the work's 'non-actual'[252] reality is created, intricately incorporating not only mimetic representations of the work's 'storyworld'[253] but also the personal contexts of the audience (as outlined earlier) and the 'metareferential'[254] elements of the work; that is, those elements which signal that it is a constructed work of narrative rather than an objective reality.[255] For Phelan, it is this illusionist process – triggered by the artist's work - which is the source of criteria for the act of meaning-making, thematic understanding, and judgement of the work's quality[256].

Aesthetic illusion is a concretisation of a pervasive and long-lived conception of the imaginative process in the arts, and is observed across narrative media as diverse as literary fiction, painting[257], film[258], architecture[259], videogames[260] and even instrumental music[261]. By its precepts, it sets a model of the imagination which entails certain qualities which artists, working towards and in concert with it, have always needed

245 Wolf, Werner, 2014.
246 Ibid.
247 Ryan on non-illusionist works
248 Werner Wolf 1993
249 Gombrich, Ernst H. *Art And Illusion.* New Jersey: Princeton UP, 1960.
250 Wolf, Werner 2014
251 Ibid.
252 Margolin, Uri, 1987, p. 110.
253 Ryan, Marie-Laure, 2013.
254 Wolf, Werner *et al. Metareference across media: theory and case studies.* Amsterdam: Rodopi, 2009.
255 Neumann, Birgit and Nunning, Ansgar *Metanarration and Metafiction*, 2014 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/metanarration-and-metafiction#Wolf2009 [Accessed: 18th August 2018].
256 Phelan, James *Reading People, Reading Plots: Character, Progression, and the Interpretation of Narrative. Chicago:* University of Chicago Press, 2012
257 Pochat, Gotz ' Aesthetic Illusion and the Breaking of Illusion in Painting (Fourteenth to Twentieth Centuries)'. *In:* Wolf, Werner *et al. (eds.) Immersion and Distance: Aesthetic Illusion in Literature and Other Media.* Amsterdam: Rodopi, 2013.
258 Cammack, Jocelyn 'Aesthetic Illusion and the Breaking of Illusion in Ambiguous Film Sequences'. *In:* Wolf, Werner *et al. (eds.) Immersion and Distance: Aesthetic Illusion in Literature and Other Media.* Amsterdam: Rodopi, 2013.
259 Bieger, Laura 'Architectures of Immersion: The Material Fictions of the 'New' Las Vegas'. *In:* Wolf, Werner *et al. (eds.) Immersion and Distance: Aesthetic Illusion in Literature and Other Media.* Amsterdam: Rodopi, 2013.
260 Wessely, Christian 'Aesthetic Illusion in Browser-Based Multiplayer Online Games'. *In:* Wolf, Werner *et al. (eds.) Immersion and Distance: Aesthetic Illusion in Literature and Other Media.* Amsterdam: Rodopi, 2013.
261 Bernhart, Walter 'Aesthetic Illusion in Instrumental Music?'. *In:* Wolf, Werner *et al. (eds.) Immersion and Distance: Aesthetic Illusion in Literature and Other Media.* Amsterdam: Rodopi, 2013.

to consider. Above all, this quality is the quality of 'latent'[262] or 'aesthetic' distance[263], a re-affirmation of Aristotelian ideas of mimesis[264], and later concepts of the 'willing suspension of disbelief'[265] or the 'reception contract'[266][267][268][269]. It states that audiences who engage imaginatively with artworks are always subject to a 'prospective orientation'[270], a 'certain degree of pretence'[271] that ensures that the audience will never 'give way... to the[ir] fantasies'[272]. This detachment from the work, while not conscious, is certainly 'wilful'[273]: part of the manner in which aesthetic works impart their communicative intentions in a 'basically pleasurable'[274], and thus instructive, manner. By such a model, the thematic, historical and personal significances at the heart of Project `knole` can only be transmitted and developed precisely because we know, in some sense, that Anne and her creature are not real, and never were. This knowledge is an integrated part of the process of reception.

This quality of aesthetic illusion necessarily (and, in the work of Wolf, explicitly) 'distinguishe[s]' it from other 'related states in real life'[275]: the processes of imagination, 'illusory and hallucinatory phenomena'[276] which underlie much of our perception, and evaluation, of the 'vast dynamic world of impulse and dream'[277] which is the preserve of unaestheticised human life: 'all [of our] human behaviours and experience' that are not explicitly part of our experience of the aesthetic[278]. Wolf provides a partial list of what these states might contain, including 'delusions', 'conceptual and perceptual errors', 'hallucinations', religious and superstitious experiences, and the mental representation of real social

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262 Wolf, Werner, 2004, p. 328.
263 Wolf, Werner, 2014.
264 Aristotle, 1996.
265 Coleridge, Samuel Taylor, Leask, Nigel *(eds.) Biographia Literaria.* London: J.M. Dent, 1997.
266 Wolf, Werner, 2014.
267 Oatley, Keith 'A taxonomy of the emotions of literary response and a theory of identification in fictional narrative'. *Poetics* 23 (1), 1994, pp. 53-74.
268 Gehlen, A *Zur Soziologie und Asthetik der modemen Malerei*. Frankfurt: Athenaurn, 1960.
269 Gerrig, Richard J. *Experiencing Narrative Worlds: On the Psychological Activities of Reading*. New Haven: Yale UP, 1993.
270 Wolf, Werner, 2014.
271 Hepola, Alison Jill 'The Reality of Fictional Characters and the Cognitive Value of Literature: Some Surprising Insights from Philosophy' *Expositions* 8 (2), 2014, pp.79-89, p. 80.
272 Childs Peter and Fowler, Roger, *The Routledge Dictionary of Literary Terms.* New York: Routledge, 2006.
273 Wolf, Werner, 2014.
274 Ibid.
275 Ibid.
276 Sagan, Carl *The Demon-Haunted World: Science as a Candle in the Dark.* London: Random House, 2011.
277 Jones, Robert Edmond. *The Dramatic Imagination: Reflections and Speculations on the Art of Theatre.* New York: Routledge, 2004, p. 1.
278 Sagan, Carl, 2011.

relationships[279]. However, by definition it could include any state which does not fulfil the precepts of aesthetic illusion: distanced, aesthetically pleasurable, 'wilful'[280] and 'ludic'[281] experiences arising from artifice.

This bifurcation of the human imagination, and the confident delineation of the 'prototypical aesthetic experience'[282], is of firm institutional relevance across narrative practice, and part and parcel of most common models of artistic methodology: methodologies that seek, from such general principles, a specific resonance. Artists attempting to create resonant fictional characters, and their fictional narratives, must maintain and curate the 'reception contract'[283] which allows audiences to balance between imaginative immersion and healthy detachment. They must manage an artificial space which represents something like the real world yet is to be approached and processed differently, by formal and 'metareferential'[284] accord. They must 'defamiliarise' and 'make strange'[285] the represented world by relying on artificial structures of reception which render it instructive. Examples for artists, necessarily, draw from other successful artifices: the canons that went before them, and the developmental literature of their own particular craft. The resonance of fictional character, as such, is not the resonance of personhood, but the resonance of an artifice that oversees a bounded and contingent simulation of personhood. The processes by which we experience, understand and communicate with persons outside the aesthetic paradigm are seemingly of a different type; the imagined lives of strangers, our mental configurations of spouses, parents and friends, the inhabitants of our dreams and spiritual experiences, imaginary friends[286][287][288], our 'counterfactual' or subjunctive selves, the mediations of living celebrities and dead notables: in short, the 'often encountered yet little acknowledged'[289] 'fictional entities' or 'ficta' of our waking and sleeping lives.

279 Wolf, Werner, 2014.
280 Ibid.
281 Nell, Victor *Lost in a book: The psychology of reading for pleasure.* Connecticut: New Haven Press, 1988.
282 Seif El-Nasr, Magy *et al.* 'Dynamic Lighting for Tension In Games'. *Game Studies* 7 (1), 2007.
283 Wolf, Werner 2014.
284 Wolf, Werner *et al.* 2009.
285 Shklovskij, Viktor 'Art as Technique'. *In:* Rivkin, Julie and Michael, Ryan *(eds.) Literary Theory: An Anthology.* Malden: Blackwell Publishing, 1998.
286 Taylor, Marjorie *Imaginary Companions and the Children Who Create Them.* Oxford, OUP, 1999.
287 Taylor, Marjorie *et al.* 'Imaginary Worlds in Middle Childhood: A Qualitative Study of Two Pairs of Coordinated Paracosms'. *Creativity Research Journal* 27 (2), 2015, pp. 167-174.
288 Hoff, Eva V. 'Imaginary Companions, Creativity and Self-Image in Middle Childhood' *Creativity Research Journal* 17 (2-3), 2005, pp.167 – 180.
289 Kroon, Fred *et al.* 2011

These mentally-maintained characters, these persons, can serve as inspiration for aesthetic representation. There are many narratives about friends and lovers, and artists certainly draw upon the emotional and intellectual models that we use for such people in our lives when considering how we will respond to their works. They are arguably indispensible to all mimetic art. However, in considering the mechanics of our actual relationships with such people, as opposed to the people in our favourite novels, films and videogames (and the mental processes that we undertake in response to them) they remain a separate breed.

Section 1.4: Expanding The Concept Of Imagination

It is important, in considering aesthetic illusion, not to overstate the differences between the two sides of the imagination that it charts. In building on the work of Bullough[290] Wolf states that, on a continuum of immersion and distance, most aesthetic work is very heavily skewed towards immersion, and relies on simulation of many of the 'related' structures by which we engage with everyday life[291]. Other scholars, in other fields, agree[292]. Oliver Grau, in his study on virtuality, states that much of Western art has been engaged in this pursuit of verisimilitude, which sometimes even 'temporarily overwhelm[s]' the perception of the real versus unreal[293]. However, the 'real/fictional dichotomy'[294] remains central to the orthodoxy, alongside the insistence that the 'culturally acquired awareness of the difference between representation and reality'[295] is vital to the functional resonance of aesthetic narrative response.

Again, however, the post-classical turn in a variety of disciplines has muddied, and perhaps dissolved, the supposedly 'impermeable ontological domains'[296] of mundane and aesthetic illusion. Much of this work is interdisciplinary in nature[297], a 'convergence'[298] between the sciences and the humanities[299] which fundamentally 'reorient readings'[300] of aesthetic and narrative theory. From cognitive psychology[301][302], social psychology and communication theory[303] to neuroscience[304][305],

290 Bullough, Edward "Psychical Distance' As A Factor In Art And An Aesthetic Principle'. *Psychology* 5 (2), 1912, pp. 87 – 118.
291 Wolf, Werner, 2014.
292 Khandaker-kokoris
293 Grau, Oliver *Virtual Art: From Illusion To Immersion.* London: The MIT Press, 2003, p. 17.
294 Sklar, Howard *Believable Fictions: On the Nature of Emotional Responses to Fictional Characters*, 2009 [Online]. Available at: https://blogs.helsinki.fi/hes-eng/volumes/volume-5/believable-fictions-on-the-nature-of-emotional-responses-to-fictional-characters-howard-sklar/ [Accessed 8th August 2018].
295 Wolf, Werner, 2014.
296 Moran, 2017
297 Herman, David. *Narratology Beyond The Human*. Oxford: Oxford University Press, 2018.
298 Caracciolo, Marco, 2013, p.
299 Lennon 2010
300 Ljungberg, Christina 'Reading as mapping'. *In:* Tally, Robert T. Jr. *(eds.) The Routledge Handbook of Literature and Space*. London: Routledge, 2017. pp.95-105, p. 95.
301 Holland, Norman *The Nature of Literary Response: Five Readers Reading*. New Jersey: Transaction, 2011.
302 Bortolussi, Marisa and Dixon, Peter *Psychonarratology: Foundations for the Empirical Study of Literary Response.* Cambridge: Cambridge University Press, 2003.
303 Green, Melanie C. *et al. Narrative Impact: Social and Cognitive Foundations.* London: Taylor and Francis, 2003.
304 Farrow, Tom F.D. *et al.* 'Investigating the functional anatomy of empathy and forgiveness'. *Neuroreport* 12 (11), 2001, pp. 2433 – 2438.
305 Vogeley, Kai and Fink, Gereon 'Neural correlates of the first-person perspective'. *Trends in Cognitive Sciences* 7 (1), 2003, pp. 38-42.

anthropology[306], evolutionary science[307][308] and cognition studies[309][310][311][312], these investigations and theoretical approaches are demonstrating how traditional divisions of the imagination between aesthetic and everyday mental processing – what Jones calls the 'now-being-laid-down'[313] - have little basis in scientific fact. These developments are not only interesting intellectually, but may be useful methodologically to artists considering imagination as part of their toolset for creating character: particularly when it comes to critiquing the divide perceived between mental engagement with actual people and with fictional characters.

At its most basic, such interdisciplinary research looks at the 'imaginative systems'[314] as a biological, semantic and cultural faculty which is 'constitutive of being human'[315]; operating, no matter its focus, according to commonly-shared 'ancient embodied systems'[316], and cultural influences. The disciplines of biosemiotics[317], constructivist psychology[318], embodied cognition[319][320], phenomenology[321][322][323] and many others mark developments in the imagination as the apparatus of 'adaptation in a hostile world... among social primates'[324] in an unpredictable and complex environment that was navigated by waypoints of social success and ostracisation, physical danger, nutritional resources and reproductive opportunities[325]. In this milieu, such elements 'that matter[ed] most to the... success of our

306 Markowski, Michel Pawl 'Anthropology and Literature'
307 Pinker, Steven *How The Mind Works.* New York: Norton, 1997.
308 Carroll, Joseph 'Evolution and literary theory'. *Human Nature* 6 (2), 1995, pp. 119 – 134.
309 Burke, Michael and Troscianko, Emily T. 'Mind, brain, and literature: A dialogue on what the humanities might offer the cognitive sciences'. *Journal of Literary Semantics* 42 (2), 2013, pp. 141 – 148.
310 Herman, David. *Cognitive Narratology*, 2013 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/cognitive-narratology-revised-version-uploaded-22-september-2013 [Accessed 8th August 2018].
311 Caracciolo, Marco, 2013.
312 David Herman 2002
313 Jones, Owain 'An Ecology Of Emotion, Memory, Self and Landscape'. *In: Emotional Geographies*
314 Koenig, Nikolaus '"Imaginary Systems" - Media Comprehension, and the Systemic Organization of Human Experience' *Systema* 4 (2), 2016, pp. 29-47.
315 Fish, Stanley 'Interpreting the "Variorum"' *Critical Enquiry* 2 (3), 1976, pp.465-485, p.
316 Asma, Stephen T. *Imagination Is Ancient*, 2017 [Online]. Available at: http://aeon.com/essays/imagination-is-such-an-ancient-ability-it-might-precede-language [Accessed 8th August 2018].
317 Kull, Kalevi *et al.* 'Theses on Biosemiotics: Prolegomena to a Theoretical Biology'. *Biological Theory* 4 (2), 2009, pp.167–173.
318 Kriz, Willy Christian 'A Systemic-Constructivist Approach to the Facilitation and Debriefing of Simulations and Games'. *Simulation and Gaming* 4 (5), 2010, pp.663 -680.
319 Kenderdine, Sarah 'Embodiment, Entanglement, and Immersion in Digital Cultural Heritage' *In:* Schreibman, Sarah *et al. (eds.) A New Companion to Digital Humanities.* New York: John Wiley, 2016.
320 varela
321 Merleau -Ponty, Maurice *The Phenomenology of Perception.* New York: Routledge, 2012.
322 Shapiro, Lawrence *The Mind Incarnate.* Massachussetts: The MIT Press, 2004.
323 Caracciolo, Marco, 2013.
324 Asma, Stephen T, 2017.
325 Dennett, Daniel C. *Breaking The Spell: Religion as a natural phenomenon.* London: Penguin, 2007.

ancestors'[326], by an evolutionary standard, were privileged; and a mediated perception of the environment was created which privileged pattern, opportunity, social others, reassuring familiarity and 'supernormal stimuli'[327]. This 'perceptual world'[328], what biosemioticians call the 'significant surround'[329], formed part of the total imaginative faculty of the human organism, a combination of 'umwelt' (outer) and 'innenwelt' (inner) environments[330]: a tool interpenetrated with the body[331], its 'motorisensor capacities'[332], emotive and memory faculties[333][334], the 'mind incarnate'[335][336], and the surrounding environment[337][338] to produce a 'mutually interactive'[339] process of communication, generation and dissemination of meaning between the individual and the outside world, applying a structure to experience and using this structure to 'orient [action] towards goals'[340]. For such scholars it is these acts of interpretation, communication and subjective generation of significance which characterise the human mental condition today.

The mechanics of such interpretation remains a subject of debate, particularly between those who take a computational, cognitivist or procedural view of mind – that it is a centralised tool of 'information processing'[341] – and those who take the more diffuse, embodied perspective outlined above[342]. An uneasy 'compatibilist'[343] approach has emerged which combines elements of both: in which the mind and its 'processing elements'[344] serve as a central, organising factor, alongside 'mindless' or

326 Dennett, Daniel C. 2007, p.
327 Dennett, Daniel C., 2007, p.
328 Saslow, Carol A. 'Understanding the Perceptual World of Horses'. *Applied Animal Behaviour Science* 78 (2-4), 2002, pp.209 – 224, p. 210.
329 Emmeche, Claus 'Does a robot have an Umwelt? Reflections on the qualitative biosemiotics of Jakob von Uexkull'. S*emiotica* 134 (1/4), 2001, pp. 653 – 693, p. 653.
330 Sharov, Alexei A. 'Functional Information: Towards Synthesis of Biosemiotics and Cybernetics'. *Entropy* 12 (5), 2010, pp.1050 – 1070, p. 1050.
331 Shapiro, Lawrence, 2004.
332 Cowart, Monica *Embodied Cognition* [Online]. Available at: https://www.iep.utm.edu/embodcog/ [Accessed 8th August, 2018].
333 Miall, David S., 1995
334 Oatley, Keith, 1994.
335 Shapiro, Lawrence *The Mind Incarnate.* Massachussetts: The MIT Press, 2004.
336 Rosch, Eleanor *et al. The embodied mind: Cognitive science and human experience.* Massachussetts: The MIT Press, 1991.
337 Clark, Andy *Supersizing the Mind: Embodiment, Action, and Cognitive Extension.* Oxford: Oxford University Press, 2008.
338 Barsalou, Lawrence W. 'Grounded Cognition'. *Annual Review of Psychology* 59, 2008, pp.617 – 645.
339 Cowart, Monica.
340 Rochberg-Halton, 1981
341 Milkowski, Marcin. *Explaining The Computational Mind.* London: The MIT Press, 2013, p. viii.
342 Cowart, Monica.
343 Ibid.
344 Dix, Alan *et al.* Human-Computer Interaction. Essex: Pearson, 2004.

subdoxastic reactions to stimuli[345], for an 'active process of interpretation'[346] which assimilates information communicated about the 'umwelt' into personal systems of rules, 'mental models'[347] 'scope syntaxes'[348], 'scripts'[349] and 'schemas'[350], flexible semantic structures which can be tested in 'mental simulation'[351] and adapted if those simulations no longer serve. In this way, the imagination evolved as a partial, personal and importantly pragmatic model of the 'significant surround': a highly useful adaptive tool, serving in the detection of relational 'patterns of information'[352], 'mental maps of time and space'[353] to give us 'a coherent understanding of disparate actions and events'[354] which explain the past, process the present and forearm for the future[355].

It is this process of cognitive abduction, this seeking of 'eventfulness'[356] and 'causality'[357] and the drawing of illustrative concatenations of events and stimuli from the real world, which is most generally called narrative: and in post-classical narratology, by what has been called 'the narrative turn'[358] in both the humanities and the social sciences[359][360] it has come to be seen as a 'human universal'[361] 'constitutive of prototypical human experience'[362]; 'a construct of our minds' without 'specific form'[363], predating the narrative arts in which it was originally identified[364]. Some scholars criticise what they see as an unconsidered

345 Nass, Clifford and Moon, Youngme 'Machines and Mindlessness: Social Responses to Computers'. *Journal of Social Issues* 56 (1), 2000, pp.81 – 103, p.81.
346 Rochberg-Halton, 1981
347 Johnson-Laird, P.N. *Mental Models: Towards a Cognitive Science of Language, Inference and Consciousness*. Massachusetts: Harvard UP, 1983.
348 Cosmides, Leda and Tooby, John 'Consider The Source: The Evolution of Adaptations for Decoupling and Metarepresentation' *In:* Sperber, Dan *et al. Metarepresentations: A Multidisciplinary Perspective*. Oxford: OUP, 2000, p. 59.
349 Schank, Roger and Abelson, Robert *Scripts, Plans, Goals and Understanding: An Inquiry into Human Knowledge Structures.* New Jersey, LEA, 1977.
350 Bartlett, F.C. *Remembering*. Cambridge: Cambridge University Press, 1932.
351 Oatley, Keith 'The mind's flight simulator'. *The Psychologist* 21 (12), 2008, pp. 1030 – 1032, pp.1031.
352 Ryan
353 Byrne, Ruth and Girotto, Vittorio 'Cognitive Processes in Counterfactual Thinking'. *In:* Markman, KD *et al. (eds.) Handbook of Imagination and Mental Simulation.* London: Routledge, 2008.
354 Green, Melanie C. *et al.*, 2003.
355 Labov, 1997
356 Schmid, Wolf 'Eventfulness, Subject-dependency and Context'. *Foreign Language and Literature* 2 (1), 2010.
357 Dannenberg, Hilary *Coincidence and Counterfactuality: Plotting Time and Space in Narrative Fiction.* Nebraska: U of Nebraska P, 2008, p. 113.
358 Kreiswirth, Martin 'Narrative Turn.' *In:* Herman, David *et al. (eds). The Routledge Encyclopedia of Narrative Theory*. London: Routledge, 2005, pp. 377–382, p.377.
359 Bruner, Jerome 'The Narrative Construction of Reality'. *Critical Inquiry* 18 (1), 1991, pp.1 – 21.
360 Kriswirth, Martin 'Merely Telling Stories? Narrative and Knowledge in the Human Sciences'. *Poetics Today* 21 (2), 2000, pp.293 – 318.
361 White, Hayden 'The Value Of Narrativity in the Representation of Reality'. *Critical Inquiry* Autumn 1980, pp. 5 – 28, p.6.
362 Fludernick, Monika *Towards a 'Natural' Narratology*. London: Routledge, 1996, p. 12.
363 Sternberg
364 Morris, Desmond, 2013, p. 96

'pannarrativism'[365][366][367], but the popularity of the discourse, and the appearance of evidence supporting it, shows no signs of abating.

Debates wax and wane as to how, and in what way, these internalised, 'self-narratives'[368], what Tanya Luhmann calls 'living systems', became publicised in external, social 'communicating systems'[369], and thus into aestheticised leisure narratives: the roles of evolution versus enculturation[370][371][372], of language[373][374][375][376][377][378][379], and of religious belief (see Chapter 3), sequentially or 'in symbiotic relation with each other'[380] remain the key determinants. Whatever the case, it is clear that this 'flexible cognitive frame'[381] is directly called upon when engaging with aesthetic narratives today, using the same tools and faculties employed in our engagement with the real world to comprehend 'sequences of events involving thinking individuals, linked by causal relations, motivated by a conflict, and aiming at its resolution'[382]. The 'storyworlds'[383], 'cosmos'[384], 'wahrnehmung'[385] or 'sujet'[386], (to use an old Formalist literary term) of narrative artworks are perceived by their audiences through the media in which they are represented. Like the real world, this world is not experienced as complete, but rather according to a set of waypoints of attention. While this process of attention is entirely determined by the human subject's perception in the real world, in constructed artworks this selective representation is a necessary part of its construction: the

365 Eskenlinen, Markku *Markky Eskenlinen's Response*, 2004 [Online]. Available at: http://electronicbookreview.com/essay/markku-eskelinens-response/ [Accessed 8th August 2018].
366 Juul doesn't like narrative turn
367 Ryan "inflated"
368 Gergen, Kenneth and Gergen, Mary 'Narratives of the Self'. *In:* Hinchman, Lewis and Hinchman, Sandra *(eds.) Memory, Identity, Community: The Idea of Narrative in the Human Sciences.* New York: State of New York University Press, 1997, p. 163.
369 Mellmann, Katja, 2012, p.69
370 Pinker, Steven, 1997.
371 Mellmann, Katja, 2012.
372 Dautenhahn 2003
373 Asma, Stephen T, 2017.
374 Ong, Walter J. *Orality and Literacy.* London: Routledge, 2013.
375 Benzon, William 'The Evolution of Narrative and the Self'. *Journal of Social and Evolutionary Systems,* 16 (2), 1993, pp.129 – 155.
376 Turner, 1996
377 Caracciolo, Marco, 2013, p. 10.
378 Bordwell, 2007
379 Turner, 1996
380 Ryan, Marie-Laure, 2014.
381 Herman, David *Story/Logic: Problems and Possibilities of Narrative.* Nebraska: University of Nebraska Press, 2002, p. 49.
382 Ryan, Marie-Laure, 2009, p.43.
383 Ryan, Marie-Laure, 2013.
384 Nash, Christopher *World-Games: The Tradition of Anti-Realist Revolt*. London and New York: Methuen, 1987, p.8.
385 Iser, Wolfgang, 1972.
386 Wood, Hannah 'Dynamic Syuzhets: Writing and Design Methods for Playable Stories'. *In:* Nunes, Nuno *Interactive Storytelling*. London: Springer, 2014.

'focalisation'[387] mentioned at the start of this chapter. The 'fragmentary nature of information provided'[388], the selective 'leerstellen'[389], 'fault-lines'[390] or gaps in between the work's representations, both serve to structure the attention space and act as 'inference invitations'[391]; a pre-packaged umwelt or 'body of information' that attracts our inherent 'narrative comprehension'[392] and begins the process of communication.

While the media in which this fictive world is perceived may be of many kinds, the 'tacit'[393] imaginative apparatus that sublimate and communicate with it is the same that the human species has used through history. It is influenced by a 'layer[ing]'[394] of the subject's personalities, memories, 'top-down'[395] mental models[396] and emotions[397][398] and even our own bodies[399][400][401][402][403] to bear in 'sense-making'[404] and 'habituation'[405], 'mapping… textual cues onto the… dimensions of mentally configured worlds'[406]. This generalised, atavistic process is mostly 'indifferent'[407] to the 'unnatural'[408] elements of many fictional representations: while debates continue about whether or not audiences of fictive or 'secondary' worlds always process these worlds in reference to their knowledge of 'primary'

387 Niederhoff, Burkhard *Focalization*, 2013 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/focalization [Accessed 8th August 2018].
388 Sklar, Howard, 2009.
389 Iser, Wolfgang, 1978
390 Kahneman, Daniel and Tversky, Amos 'The Simulation Heuristic'. *In:* Kahneman. David (*eds.*) *Judgement Under Uncertainty: Heuristics and Biases.* New York: Cambridge University Press, 1982, pp 201–208.
391 Bortolussi, Marisa and Dixon, Peter, 2003, p. 124
392 Jenkins, Henry 'Game Design as Narrative Architecture'. *In:* Salen Tekinbas, Katie and Zimmerman, Eric (*eds.*) *The Game Design Reader: A Rules of Play Anthology.* London: The MIT Press, 2006, pp. 670 - 690
393 Foy, Jeffrey and Gerrig, Richard 'Flying to Neverland: How readers tacitly judge norms during comprehension'. *Memory and Cognition* 42 (8), 2014, pp.1250 – 1259.
394 Caracciolo, Marco, 2013, p.
395 Culpeper, Jonathan *Language and Charactersiation: People in Plays and other Texts.* London: Longman, 2001, p. 28.
396 Oatley, Keith, 2008.
397 Miall, David S., 1995.
398 Oatley, Keith, 1994.
399 Kuzmičová,, Anežka 'Presence in the reading of literary narrative: A case for motor enactment'. *Semiotica* 189 (1), 2012, pp.23 -48.
400 Kuzmičová, Anežka, 2014.
401 Caracciolo, Marco, 2013, p.
402 Wojciehowski, Hannah and Gallese, Vittorio 'How StoriesMake Us Feel: Towards An Embodied Narratology'. *California Italian Studies* 2 (1), 2011.
403 Fludernik, Monika 'Natural Narratology and Cognitive Parameters'. *In:* Herman, David (*eds.*) *Narrative Theory & The Cognitive Sciences*. Stanford: CSLI, 2003.
404 Tavinor, Grant *The Art Of Videogames.* New York: Wiley, 2007,
405 Caracciolo, Marco, 2013, p.
406 Herman, David, 2013.
407 Ronen, Ruth *Possible Worlds In Literary Theory*. Cambridge: Cambridge University Press, 1994.
408 Alber, Jan *Unnatural Narrative: Impossible Worlds in Fiction and Drama.* Nebraska: University of Nebraska Press, 2016.

reality[409][410][411][412], it has been established that engagement is more concerned with what has variously been called 'coherence truth'[413], logical completeness'[414] and 'textual coherence'[415], amongst others[416][417]: the ability of a storyworld to remain internally consistent, and knowledge about it 'text-specific'[418], even if that consistency is based in irrational, unreal, or even, in some cases, 'contradictory'[419][420] elements. In this, the functional imagination makes little hierarchy of the 'cosmoses' in which it operates, as long as each maintains its own, observed and self-defined rules[421].

Given their scholarly pedigree, it is unsurprising that other persons in such 'cosmos' – whether real, represented or fully imaginary – are some of their most important elements, and the fulcrum around which most narratives turn. As social animals, human survival involves accurate mental simulations about the intentions and actions of other social beings in order to make beneficial social decisions[422]: using a 'sophisticated process of interpretation with narrative at its core'[423]. Our ability to 'mentalise'[424], empathise[425] and 'impute… what is going on in another person's mind'[426] from partial and indirect social cues is another adaptive tool which finds its 'natural extension' in our interactions with fictive others[427][428]. I have already outlined a 'character-focussed' approach to narrative, and here it finds its

409 Wolf, Mark J. 'Introduction'. *In:* Wolf, Mark J. (*eds.*) *Revisiting Imaginary Worlds.* London: Routledge, 2016, p.
410 Ibid.
411 Richardson, Brian *Unnatural Narrative: History, Theory and Practice.* Ohio: Ohio State University Press, 2015.
412 Ryan, Marie-Laure 'Fiction, Non-Factuals and the Principle of Minimum Departure'. *Poetics* 9, 1980, pp. 403 – 422.
413 Oatley, Keith 'Emotional Intelligence and the Intelligence of Emotions'. *Psychological Enquiry* 15 (3), 2004, pp.216 – 222, p. 216.
414 Crittenden, Charles 'Fictional characters and logical completeness'. *Poetics* 11 (4-6), 1982, pp. 331-344.
415 Toolan, Michael *Coherence*, 2013 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/coherence [Accessed; 20th August 2018].
416 "world consistency" - rodrigo lesa and joao araujo
417 "world completeness" (benjamin j. robertson).
418 Emmott, Catherine *Narrative Comprehension: A Discourse Perspective*. Oxford: OUP, 1997, p. 36.
419 Ryan, Marie-Laure, 2014.
420 Moran, 2017
421 Nash, Christopher, 1987, p.8.
422 Saxe, Rebecca *How we read other's minds,* 2009 [Online]. Available at: https://www.ted.com/talks/rebecca_saxe_how_brains_make_moral_judgments [Accessed: 20th August 2018].
423 Reidl, Mark *et al.* 'Game AI as Storytelling'. *In:* Gonzalez-Calero, Pedro Antonio and Gomez-Martin, Marco Antonio *(eds.) Artificial Intelligence for Computer Games.* London: Springer, 2011, p. 130.
424 Waytz, Adam *et al.* 'Response of Dorsomedial Prefrontal Cortex Predicts Altrusitic Behavior'. *The Journal Of Neuroscience* 32 (22), 2012, pp.7646 – 7650, p. 7646.
425 Cheetham, Marcus 'Virtual milgram: empathic concern or personal distress? Evidence from functional MRI and dispositional measures'. *Frontiers in Human* Neuroscience 3 (29), 2009, pp. 1 – 13.
426 Goldman, Alvin *Simulating Minds: The Philosophy, Psychology and Neuroscience of Mindreading'*. Oxford: Oxford University Press, 2006.
427 Neuroscience and personhood
428 Green, 2005

scientific grounding[429][430][431][432]: the satisfaction of a 'core appetitive circuit'[433] by processing our perception of others 'whose inner lives are rarely easily discerned but warrant exploration'[434]. Again, the 'texts' of the artist function as umwelts, in conjunction with the audience's personal faculties, which communicate 'motives, intentions, beliefs and.. resulting behaviour'[435][436]. Recent scholarship also points to two examples of how characters regularly transcend their distanced fictionality by dint of this evolved receptive phenomenon and enter realms usually reserved for other, 'real' people: namely, by facilitating real personal change, whether positive[437][438][439][440][441] or negative[442], and even leading us to conduct 'parasocial', 'psychologically real and meaningful' relationships with otherwise 'unreal' people[443][444][445][446]. This consideration of relationships with fictional people, directly instructive of real life, begins an assault on the dichotomy's central pillar: that of 'aesthetic distance'. Again, an interdisciplinary overview demonstrates, from both sides, a weakening of confidence in its definition.

From the perspective of aesthetic fiction – for which, in classical definitions, distance is the constitutive element – the 'puzzle of fictional emotions'[447] provides an intriguing point of discussion. This was highlighted by Colin Radford in his 'paradox of fiction'[448], which demonstrated the issue that necessarily arises when considering the apparently 'real' emotions experienced by audiences towards characters that they supposedly know,

429 Sklar, Howard, 2009.
430 Zunshine, Lisa *Why We Read Fiction: Theory of Mind and the Novel.* Columbus: The Ohio State University Press, 2006.
431 Vermeule, Blakey *Why Do We Care About Literary Characters?* Baltimore: John Hopkins University Press, 2010.
432 Nomura, Kohei and Akai, Seiki, 'Empathy with Fictional Stories: Reconsideration of the Fantasy Scale of the Interpersonal Reactivity Index'. *Psychological Reports* 110 (1), 2012, pp.304 – 314.
433 Costa, 2010
434 Kidd, David Comer and Castano, Emanuele 'Reading Literary Fiction Improves Theory Of Mind'. *Science* 342 (6156), 2013, pp.377 – 380, p. 377.
435 Palmer, 2010
436 Foy, Jeffrey and Gerrig, Richard, 2014.
437 Nicolopoulou, Ageliki and Richner, Elizabeth 'From Actors to Agents to Persons: The Development of Character Representation in Young Children's Narratives'. *Child Development* 78 (2), 2007, pp. 412 - 429
438 Cohen, Jonathan, 2001.
439 Kidd, David Comer and Castano, Emanuele, 2013, p. 377.
440 Oatley, Keith and Mar, Raymond, 2007.
441 Vermeule, Blakey, 2010.
442 Tsay, Mina and Krakowiak, Maja 'The impact of perceived character similarity and identification on moral disengagement'. *IJART* 4, 2011, pp.102 – 110.
443 Mar, Raymond A *et al.,* 2011.
444 Derek, Jaye L. *et al.* 'Parasocial relationships and self-discrepancies: Faux relationships have benefits for low self-esteem individuals'. *Personal Relationships* 15 (2), 2008, pp.261 – 280.
445 Stever, Gayle 'Mediated vs. Parasocial Relationships: An Attachment Perspective'. *Journal of Media Psychology* 17 (3), 2013.
446 Rain, Marina *et al.* 'Adult attachment and transportation into narrative worlds'. *Personal Relationships* 24 (1), 2016, pp.49 – 74.
447 Tavinor, Grant, 2007
448 Radford, Colin 'How Can We Be Moved by the Fate of Anna Karenina?' *Proceedings of the Aristotelian Society* 49, 1975, pp. 67-80.

rationally, to be fictional[449]. Despite its age, debates 'continue… to rage'[450][451], with some scholars insisting the emotions are only 'pretend'[452], and others stating that imagined characters can sidestep 'prospective orientation' entirely, and provoke real effects[453][454][455][456]. The research on 'parasocial' relationships introduced above certainly seems to privilege the latter explanation. The idea that 'pretend' emotions, placed in a subjunctive sandbox, could provoke the sort of 'self-expansion'[457], perspectival change and fundamental emotional and cognitive impact arising from aesthetic engagement[458], seems doubtful. An explanation lies in the 'anthropological case for the importance of aesthetic experience'[459], in which modern narratives are an enculturated extension[460][461] of a 'basic human need'[462] for narrative comprehension, deriving from biologically and culturally evolved 'subsistence' practices which used narratives to transmit important information within and between social groups[463][464][465]. In this discourse, the old "human' interest question'[466], the focus of fiction on 'how to live… mortal life'[467], is updated to include such anthropological and biological considerations. Now the boundary between distanced, pleasurable stories and undistanced narratives about the world is drawn far less distinctly: art becomes participatory in moral reality, not 'pretend' or 'motivationally inert'[468], but an element of our psychic actualisation.

449 Moran, Richard 'The Expression Of Feeling In Imagination'. *The Philosophical Review* 103 (1), 1994, pp. 75 – 106.
450 Schneider, Steven *The Paradox Of Fiction – The Internet Encyclopedia of Philosophy*, 2017 [Online]. Available at: http://www.iep.utm.edu/fict-par/ [Accessed: 18th August 2018].
451 Ryan, Marie-Laure, 2014, p. 10.
452 Walton, Kendall 'Spelunking, Simulation and Slime: On Being Moved by Fiction'. *In:* Hjort, Metta (*eds.) Emotion and the Arts*. Oxford: Oxford University Press, 1997.
453 Novitz, David *Knowledge, Fiction and Imagination*. Philadelphia, Temple University Press, 1987.
454 Hartz, Glenn 'How We Can Be Moved by Anna Karenina, Green Slime, and a Red Pony.' *Philosophy* 74, 1999, pp. 557-78.
455 Säätelä, Simo 'Fiction, Make-Believe and Quasi Emotions.' *British Journal of Aesthetics* 34, 1994, pp. 25-34.
456 Young, Garry 'Virtually real emotions and the paradox of fiction: Implications for the use of virtual environments in psychological research'. *Philosophical Psychology* 23 (1), 2010, pp. 1- 21.
457 Shedlosky-Shoemaker, Randi *et al.* 'Self-Expansion Through Fictional Characters'. *Self And Identity* 13 (5), 2014, pp. 556 – 578.
458 Mar, Raymond and Oatley, Keith, 2008.
459 Thomas, Brook '*The Fictive and the Imaginary*: *Charting Literary Anthropology*, or, What's Literature Have to Do with It?' *American Literary History* 20 (3), 2008, pp.622 – 631, p. 622.
460 Black, John and Wilensky, Robert 'An Evaluation of Story Grammars'. *Cognitive Science* 3 (3), 1979, pp. 213 – 229.
461 Johnson-Laird, Philip 'Mental models and human reasoning'. *PNAS* 107 (43), 2010, pp. 18243 – 18250.
462 Wolf, Werner, 2014.
463 Sugiyama, Michelle 'Food, foragers, and folklore: the role of narrative in human subsistence'. *Evolution and Human Behavior* 22 (4), 2001, pp.221 – 240.
464 Sugiyama, Michelle 'On the origins of narrative : Storyteller bias as a fitness-enhancing strategy' *Human Nature* 7 (4), 1996, pp. 403 – 425.
465 Coe, Kathryn *et al.* 'Once Upon A Time: Ancestors and the Evolutionary Significance of Stories'. *Anthropological Forum* 16 (1), 2006, pp. 21- 40.
466 Olsen, Stein Haugom. *The End of Literary Theory*. Cambridge: Cambridge University Press, 1987, p. 67.
467 Nagel, Thomas *Moral Questions*. Cambridge: Cambridge University Press, 1979, p. ix.
468 McMahon, Jennifer 'Imagination' *In:* McMahon, Jennifer *(eds.) Social Aesthetics and Moral Judgment: Pleasure, Reflection and Accountability*. New York: Routledge, 2018, p. 66.

From the perspective of the everyday – that realm in which distance is supposedly weaker, and often absent altogether – a similar assault occurs. The literature on these mundane imaginings reveals that 'prospective orientation' – the ability to create 'subjuntive'[469], 'as-if'[470] perspectives on scenarios which have internal, if not external, consistency[471], is not restricted to the reception of aesthetic works. The possible worlds[472] in literature are joined by a phalanx of equally fictional versions of the real world that are personally maintained by each human individual, and from which they remain 'rational[ly] distant'[473], as a fundamental part of healthy psychological makeup[474]; 'counter-factual' realities[475] which are constitutive of evolved imaginary faculties. It is only by 'cognitive metarepresentation'[476], mentally representing alternatives to perceived reality and standing apart from them, that humans are able to learn from their experiences[477], and 'elaborate... innovative and unpredictable responses to stimuli'[478][479].

This 'metarepresentation' manifests, across the disciplinary canons, in some remarkable ways. Research on imaginary friends – typically considered undistanced hallucinations in the naive imaginings of children – has recently reinforced the objective distance that many children maintain from these imaginings, using them not as pathological abberations, but as part of healthy psychosocial development[480][481]. The 'parasocial' relationships that we conduct with celebrities and media (or quite literally 'mediated') figures[482], 'personalities that [have] become intimate visitors'[483] in our lives, are not only typified by the 'delusions' of

469 Byrne, Ruth 'Precis of The Rational Imagination: How People Create Alternatives to Reality'. *Behavioral and Brain Sciences* 30 (1), 2007, pp. 439 – 480.
470 Mellmann, Katja, 2013, p. 74.
471 Byrne, Ruth, 2007.
472 Ryan, Marie-Laure, 2014.
473 Mellmann, Katja, 2012, p. 74.
474 Goffman's frames
475 Wong, Elaine 'The Counterfactual Mind-Set: A Decade of Research' *In:* Markman, Keith *et al (eds.) The Handbook of Imagination and Mental Simulation*. London: Psychology Press, 2008.
476 Mellmann, Katja, 2013, p. 74.
477 Mellmann, Katja, 2012, p.36.
478 Grosz, Elizabeth 2008
479 Steiner on counterfactuality in Hofstadter, 643 - we need fictive language and semantics to live.
480 Klausen, Espen and Passman, Richard 'Pretend Companions (Imaginary Playmates): The Emergence of a Field'. *The Journal of Genetic Psychology* 167 (4), 2006, pp. 349 – 364.
481 Hoff, Eva 'Imaginary Companions, Creativity and Self-Image in Middle Childhood'. *Creativity Research Journal* 17 (2-3), 2005, pp. 167 – 180.
482 Jenkins & Obama
483 Stever, Gayle 'Parasocial and Social Interaction with Celebrities: Classification of Media Fans'. *Journal of Media Psychology* 14 (3), 2009.

the obsessed fan, but by the 'social relationships'[484] of the vast majority who 'integrate' public others, whether fictional characters portrayed by actors or supposedly 'uncharacterised' celebrities, 'into their real lives'[485] as part of the normal discourse of media culture. As Giles points out, the 'point of departure'[486] between these two is hard to determine. Many other examples of abound: of Harari's 'imagined orders'[487], a theory of the consensual fictions such as money, or religion and spiritual belief, which have guided human development since its beginning, and in which distance plays a complex and sometimes contradictory role (Chapter 3 of this thesis will focus on religion and spirituality particularly, in relation to `knole` itself). As Cohn and White illustrate in this thesis' introduction, not even the reality of the historical record is safe from complication: Cohn and Ricoeur have both charted the porous 'borderline' between history and fiction, 'two vast narrative domains'[488] whose 'relationship… is… more complex than anyone will ever say'[489].

484 Giles, David 'Parasocial Interaction: A Review of the Literature and a Model for Future Research'. *Media Psychology* 4 (3), 2002, pp. 279 – 305, p. 279.
485 Kratka, Jana, 2009.
486 Giles, David, 2002.
487 Harari, Noah Yuval. *Sapiens*. London: Harvill Secker, 2014.
488 Cohn, Dorritt, 1989.
489 Ricoeur, Paul *et al. Time and Narrative*. Chicago and London: University of Chicago Press, 1990.

Section 1.5: The Expanded Imagination As Autocosmic

No study of this trend, ranging as it does across the arts, sciences and humanities, could ever be exhaustive, but the evidence above demonstrates that from discipline to discipline the divide between fiction and reality in relation to the perceptive imagination is being further complicated, or even systemically weakened. Classical (and many post-classical) concepts from aesthetic and literary theory appear more and more fragile in the face of such new developments. Leading from Wolf's earlier definition of strictly 'aesthetic' illusion[490], evidence continues to mount that everyday illusions can be 'basically pleasurable', or 'distanced', or even passive, while seemingly 'aesthetic illusions' can be as 'real' and interactive, in a psychological sense, as those encountered in the course of biological life; the full triumph of Berleant's 'aesthetic engagement' over 'aesthetic distinterestedness'[491]. The complexity and interpenetration of these states[492], and the 'oscillation'[493] across the 'borderline area' between them[494][495], relies on a modern understanding of human mental life, one arising out of a common 'interpretative compulsion'[496] that excites the 'intrinsically semantic dimension'[497] of our cognitive, emotive and embodied experience, and manifesting most commonly in the perceptive and cognitive frame of 'narrative'[498]; a form which, 'in transaction with realities'[499], is not a "specialized, ad hoc response... to narrative texts'[500] but broadly representative across human existence.

Such an understanding of the evidence suggests a problem in the narrow definition of the 'aesthetic' which has traditionally dominated Western thought[501]. The last thirty years has seen a 'continuing uncertainty',

490 Wolf, Werner, 2014.
491 Berleant
492 On the single code hypothesis, it is the sameness of the representational format that grounds functional similarities between imagining and believing (Nichols & Stich 2000, 2003; Nichols 2004a).
493 Westphal
494 Hofstadter p. 362
495 Schellenberg 2013
496 Mellmann, Katja, 2013, p. 75.
497 Monahan, Seth *Mahler's Sonata Narratives*. [PhD Dissertation]. Connecticut: Yale University, 2008.
498 Scheibe, Karl E. and Barrett, Frank *The Storied Nature of Human Life: The Life and Work of Theodore R. Sarbin*. London: Palgrave Macmillan, 2017.
499 Seligman, Steven. 'Illusion as a Basic Psychic Principle: Winnicott, Freud, Oedipus, and Trump'. *The Journal of the American Psychoanalytic Association* 66 (2), 2018, pp. 263-288, p. 263.
500 Caracciolo, Marco, 2013, p.
501 Shelley, James *The Concept of The Aesthetic*, 2017 [Online]. Available at: https://plato.stanford.edu/entries/aesthetic-concept/#AesObj [Accessed 8th August 2018].

inherited from earlier scholarship[502][503][504], as to the wisdom in separating the 'specialised human creativity of art' from 'utilitarian considerations'[505], arising from a historical disagreement on definitions of the 'artful' as opposed to 'natural objects, humans and abstracta'[506][507][508]. A critique of this 'social convention'[509] has thus led to a 'broadening of the aesthetic tradition'[510] into what Smith, in his edited book of the same name, calls the 'aesthetics of everyday life'[511], including the study of such disparate phenomena as sport[512], public behaviours[513], the weather[514] and food[515]. For Smith and his contributors, such an aesthetic theory relies less upon the object in question itself – as constructed or naturally occurring – but rather upon the 'evanescent relationship… between subject and object', the 'structuring of experiences'[516], the 'process of communication'; in other words, the procedure of imaginative engagement.[517]

Project `knole` is not such a contribution to aesthetic theory: it cannot aid in the definitive redrawing of aesthetic lines. As Mellmann admits, 'it is difficult to discover the proper psychological category by means of which our attitude toward the imaginary in art will be explained'[518]. The evidence presented above is fragmented into disciplines which are not always in agreement, or even on speaking terms. No grand theory exists for such a general topic, and perhaps never will.[519] However, the very *fact* of an indistinction between the functionality of art and real life, and the dismantling of its 'unreal discontinuity'[520] to recognise

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502 cite
503 cite
504 Berleant
505 Williams, 1983
506 Adajian, Thomas, *The Definition of Art*, 2018 [Online]. Available at: https://plato.stanford.edu/entries/art-definition/ [Accessed 8th August 2018].
507 Layton pg. 41
508 Berleant, Arnold *Aesthetics and Environment: Variations on a Theme.* London: Routledge, 2004.
509 Mellmann, Katja, 2013, p. 74.
510 Slater, Barry *Aesthetics*, 2018 [Online]. Available at: https://www.iep.utm.edu/aestheti/ [Accessed 8th August 2018].
511 Light, Andrew and Smith, Jonathan (*eds.*) *The Aesthetics of Everyday Life*. New York: Columbia University Press, 2005.
512 Welsch, Wolfgang 'Sport – Viewed aesthetically, and even as art?'. *In:* Light, Andrew and Smith, Jonathan (*eds.*), 2005, pp. 135 – 155.
513 Jocelyn Spence book
514 Saito, Yuriko 'The Aesthetics of Weather'. *In:* Light, Andrew and Smith, Jonathan (*eds.*), 2005, pp. 156 – 176.
515 Keuhn, Glen 'How Can Food Be Art?'. *In:* Light, Andrew and Smith, Jonathan (*eds.*), 2005, pp. 194 – 212.
516 Kirkpatrick, Graeme 'Video Game Image: The aesthetic character of digital gaming'. *In:*
517 Smith, Jonathan 'Introduction'. *In:* Light, Andrew and Smith, Jonathan (*eds.*), 2005, p. x.
518 Mellmann, Katja, 2012,
519 Caracciolo, Marco and Kukkonen, Karin 'Hitting The Wall? The Rhetorical Approach and the Role of Reader Response'. *Style* 52 (1-2), 2018, pp. 45-50.
520 Moran, Richard, 1994, p.

'contaminations between [the] fictional and factual'[521], has profound implications for the central concern of knole: that is, my methodology and consequent practice.

It seems clear that for an artist considering the 'quality' of their characters, and one who sites the primary engine of that 'quality' in their audience's imagination, a new understanding of the nature of that imagination would have profound effects for the way they conceptualise and produce their art. According to the evidence presented, it seems that such an artist is communicating with, and indirectly utilising, a vast continuum of all human imaginative activity, rather than a rarefied 'aesthetic' subset. This model is not merely a theoretical exercise. For me, it has profound implications for how I might go about creating characters, precisely because it liberates and broadens understanding of the processes by which imagining takes place. In trying to use these processes to my own expressive ends, I can now look beyond the aesthetic traditions in which I am, necessarily, grounded, towards broader spheres of human experience: scrutinising other acts of communication, other examples of mental processes and the structures upon which they rely, which may prove instructive; quite different from the interactions and imaginings that underlie other 'aesthetic' work, despite their shared human source. It is the resonance of these unaesthetic interactions, and their systemic processes of reception and augmentation, which may serve as the blueprint for a personal design philosophy.

Project knole was built using this philosophy; and to summarise and reference this complex, interdisciplinary position succinctly throughout this thesis, I require one more nominal term. 'Illusion', whether aesthetic or mundane, is problematic, as it has connotations of falsehood that are unhelpful: similarly 'imagination', 'hallucination' and 'mental simulation' have both general and specific meanings in a variety of disciplines, and are too entrenched, 'too heterogenous and ill-understood'[522] to represent something more precise. 'Narrative', in the general sense of 'mental representation'[523] that narratologists mean it, is again too

521 Schabert, Ina 'Fictional Biography, Factual Biography, and their Contaminations'. *Biography* 5 (1), 1982, pp.1 – 16, p.1.
522 Moran, Richard, 1994
523 Sternberg, Meir 'Universals of Narrative and Their Cognitivist Fortunes'. *Poetics Today* 24 (3), 2003, pp. 517 – 638, p. 555.

controversial in application[524][525][526], and (as I delineate at the end of Chapter 2) may contain within it associations which are unhelpful.

Instead, I have invented the term autocosmic (again, hereafter underlined to distinguish it in the text) to refer to my specific adoption of an interdisciplinary perspective on human imagination for the purposes of method. Translating as 'self-worlds', it has several qualities that make it suitable for the task. It preserves the importance of subjectivity to the construction of character, and the self-oriented, encapsulating perspective of imagination as a series of 'cosms' – similar to Nash's 'cosmos'[527] - which are both hermetically coherent and open to a sort of atmospheric osmosis, incorporating influences from outside itself. As Mark J. Wolf asserts, worlds, particularly fictional worlds, have bound within them implicit narratives without which they could not meaningfully exist[528]: similarly, the autocosmic privileges the distributed, multi-linear, systemic nature of imagined scenarios, avoiding stricter narratological bindings while preserving the importance of narrative comprehension within them. Unlike other terms in narratology, it has no prior associations and 'is not part of everyday speech and thus more suitable as a technical term with a specialized meaning'[529]. It makes no implicit distinction between the types, origins and qualities of the 'cosms' that it refers to, allowing itself to 'comprise many more things than we would normally subsume'[530] under the label of 'aesthetic' illusion. I have adapted it from another pleasing term, 'paracosm', used extensively (but not coined[531]) by the developmental psychologist Marjorie Taylor[532]. In her work, it specifically describes the intricate fictional worlds invented by children, the mentally ill and artists alike[533]. Taylor makes no judgement between these three self-expressive uses of the imagination, but finds interest in all of them; an approach which I can only hope to emulate.

524 Ryan, Marie-Laure
525 Ryan, Marie-Laure
526 Sternberg, Meir, 2003.
527 Nash, Christopher, 1987, p.8.
528 Wolf, Mark J., 2016, p.
529 Niederhoff, Burkhard, 2013
530 Mellmann, Katja 2013, p. 82.
531 Cohen, David and Mackeith, Stephen *The Development of Imagination: The Private Worlds of* Childhood. London: Routledge, 1992.
532 Taylor, Marjorie *et al.* 'Imaginary Worlds in Middle Childhood: A Qualitiative Study of Two Pairs of Coordinated Paracosms'. *Creativity Research Journal* 27 (2), 2015, pp.167-174.
533 Wolf, Mark J., 2016, p.

My approach to my work – the creation of fictional characters – is thus an autocosmic one. It is a perspective on craft which privileges an expansive view of that with which it interfaces: the imagination. It is not an entirely original perspective. Artists have always been aware of how the imaginative processes that underlie engagement with real life can shape and influence aesthetic production. Such methods range from the direct excitation of physiological traits for 'jump scares' in horror films[534], to the traditional preference for direct mimetic observation of a narrative scene as opposed to its detached narration: a 'showing' that allows us to use our evolved imaginative faculties more directly than being 'told' such a scene[535].

However, the autocosmic represents a more considered and extensive use of this model, and in particular towards one particular subset of fictional characterisation. While this chapter has remained studiously agnostic as to medium, attempting to seek out general precepts, the next chapter applies those precepts to the types of characters, specifically, that lie at the heart of works like `knole`: characters in works of narrative computational art. It is these types of characters in particular which I believe could benefit from a broader conception of imaginative engagement than that provided by traditional aesthetic theory. Given the methodological challenges facing the construction of characters of their ilk, Anne and her 'spyrit' all but required it.

534 Bruckbauer, John *et al.* 'Physiological Responses in the Anticipation of an Auditory and Visual Stimulus', 2018 [Online]. Available at: http://jass.neuro.wisc.edu/2018/01/601_14.pdf [Accessed: 18th August, 2018].

535 Klauk, Tobias and Koppe, Tilmann *Telling vs. Showing*, 2014 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/telling-vs-showing [Accessed: 18th August 2018].

2

"The Warmth Without The Fyre"

Specific Challenges, And An Autocosmic Approach,
To Authoring Resonant Computational Characters

Précis

This chapter addresses how the specific qualities of computational art, combined with the universal tenets of character and narrative outlined in Chapter 1, affords a specific type of resonant representation of personhood: the computational character. However, agreed methodologies for producing such characters remain elusive, and practice challenging; challenges which Project `knole` *not only comments upon, but seeks to ameliorate. The chapter concludes by considering how an autocosmic approach to computational character might achieve this.*

Section 2.1: Computational Characters, Specifically

The previous chapter considered fictional characters from general principles, 'transcending'[536] particular forms as universal phenomena of the human autocosmic imagination. Such agnostic theories are merited: but in methodology a 'medium-specific analysis'[537] of employed media and modes, 'frameworks'[538] 'tools... materials... and capacities'[539], cannot be avoided. Even if characters such as Anne and her 'spyrit' are 'perdurant'[540] beyond their texts, those texts do not only act as 'pipelines for the transfer'[541] of meaning, but are also constitutive 'languages'[542] and 'specific affordances[543]' by which meaning is constructed[544]. They not only facilitate resonance, but shape its very nature.

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536 Koenitz, Harmut, 2015, p.94.
537 Katharine Hayles
538 Copplestone, Tara 'Designing and Developing a Playful Past in Video Games'. *In:* Mol, Angus (*eds.*) *The Interactive Past: Archaeology, Heritage and Video Games*. Leiden: Sidestone Press, 2017, pp. 85 – 97.
539 Thomson-Jones, Katherine *The Philosophy Of Digital Art*, 2015 [Online]. Available at: https://plato.stanford.edu/entries/digital-art/ [Accessed: 8th August 2018].
540 Lewis, David Kellogg, 1986.
541 Ong, Walter J. *Orality and Literacy. The Technologizing of the Word*. London: Methuen, 1982.
542 Meyrowitz, Joshua. 'Images of Media: Hidden Ferment—and Harmony—in the Field.' *Journal of Communications* 43, 1993, pp. 55–66
543 Koenitz, Hartmut
544 Ryan. Marie-Laure, 2014.

Project knole is a work of narrative computational art, or comp-art. This is a nominal definition for an indistinct cluster of different artistic traditions, often 'present[ing]... liminal... category-challenging experiences'[545] in seemingly perpendicular cultures, many of which have contributed to knole's development. Despite such differences, these narrative cultures – from videogames (see Appendix 3) and interactive fiction to virtual heritage, digital installation and the other forms of 'interactive digital narrative'[546] - are at their methodological baseplate united by a set of 'prototypical qualities'[547].

Beginning with the universal, 'intermedial' and 'transmedial' definition of fictional character constructed in Chapter 1[548], it is clear that characters in comp-art remain 'carefully structured and constrained'[549] and 'deliberately simplified'[550] representations of a non-actual personhood and their travails, manufactured within a 'system of representation'[551] by an artist to be 'read'[552] or 'activated'[553] by its audience. This privileging of the act of 'communication' and the 'participating act'[554] as integral to fictional character, of comp-art as 'experience [rather than] artefact or object'[555], is identifiable across the literature: from Turing's original writings on artificial intelligence[556][557][558], the game design canon[559][560][561][562] and interactive

545 Turkle, Sherry 'A Nascent Robotics Culture: New Complicities For Companionship, 2006 [Online]. Available at: https://www.student.cs.uwaterloo.ca/~cs492/papers/ST_Nascent%20Robotics%20Culture.pdf [Accessed 18th August 2018].
546 Koenitz, Harmut, 2015.
547 Thon, Jan-Noel 'Mediality'. *In:* Ryan, Marie-Laure *et al* (*eds.*) *The John Hopkins Guide To Digital Media*. Balltimore: The John Hopkins University Press, 2014, p. 335.
548 Rajewsky, Irina 'Intermediality, Intertextuality and Remediation: A Literary Perspective on Intermediality'. *Intermedialites* 6 (1), 2005, pp. 43–64, p. 43.
549 Murray, Janet *Hamlet on the Holodeck: The Future of Narrative In Cyberspace*. Boston: MIT Press, 1997, p. 132
550 Crawford, Chris *Art of Computer Game Design.* New York: McGraw-Hill, 1984, p. 9.
551 Mateas, Michael 'Expressive AI: A Hybrid Art And Science Practice' *Leonardo* 34 (2), 2001, pp. 147-153.
552 Flanagan, Mary *Critical Play: Radical Game Design.* Massachussetts: The MIT Press, 2009, p. 140.
553 Calleja
554 Koenitz, Hartmut *et al.*, 2015, p. 92.
555 Candy, Linda and Ferguson, Sam (*eds.*) *Interactive Experience in the Digital Age.* London: Springer, 2014, p. 2.
556 Sterrett, Susan 'Turing's Two Tests For Intelligence*'. *Minds and Machines* 10 (4), 2000, pp. 541 – 559.
557 Turing, Alan 'Computing Machinery & Intelligence'. *Mind* 49 (22), 1950, pp. 1 – 22.
558 McCorduck, Pamela *Machines Who Think*. San Francisco: W.H. Freeman, 1979, p. 380.
559 Madigan, James *Getting Gamers: The Psychology of Video Games and their Impact on the People Who Play Them*. Maryland: Rowman & Littlefield, 2015.
560 Caroll and Rosson, 2011
561 Koenitz 'pearce's foray into the experiential dimension' – what
562 Caracciolo, Marco, 2013.

design literature[563][564][565], through to human-computer interaction[566][567][568] and audience reception explicitly[569][570].

In order to draw these parallels personally, I supplemented my work with reading groups (outlined in Appendix 1) with a study into the experiences of participants playing a selection of videogames (see Appendix 2). Despite the diversity of character representation in the games under study – from the abstract blocks of *Thomas Was Alone*[571] to the ostensibly 'realistic' representations of fantastical characters in *The Elder Scrolls V: Skyrim*[572] - in each case the player undertook a familiar process of narrative engagement, recognisable from my original reading study. Partial representations of characters, through perception and interaction, were extrapolated and vivified through imaginative, 'social'[573] augmentation and reciprocal 'sensemaking'[574] and 'signification'[575]into 'autonomous intentional agents'[576], drawing on a familiar suite of diverse 'underlying logic[s]'[577][578], 'personal needs, associations, biases and fantasies'[579][580]: the participant's personal memories[581], their socio-cultural contexts[582], their emotions[583], their bodies[584][585][586], 'non-diegetic'[587] elements

563 Tennent, Paul *et al.* 'The Challenges of Visual-Kinaesthetic Experience' *Proceedings of the 2017 Conference on Designing Interactive Systems,* 2017, pp. 1265-1276.
564 Reeves, Bryon and Nass, Clifford *The Media Equation. How People Treat Computers, Television and New Media Like Real People and Places*. Cambridge: Cambridge University Press, 1996.
565 Veldhuyzen, Wim and Stassen, Henk 'The Internal Model: What Does It Mean In Human Control?' *In:* Sheridan, Thomas and Johansen, Gunnar (*eds.*) *Monitoring Behaviour and Supervisory Control*. London: Springer, 1976, pp. 157 – 171.
566 Dix, Alan *et al.*, 2004.
567 Norman, Donald *The Design Of Future Things*. New York: Basic Books, 2007.
568 Jocelyn Spence on third wave HCI
569 Sanders, April 'Parallels Between The Gaming Experience and Rosenblatt's Reader Response Theory'. PhD Thesis: University of North Text, 2013.
570 Sanders, April 'Understanding the Video Game Experience through Reader Response Theory'. *READ* 2 (3), 2017, pp. 45 – 63.
571 Bithell, Mike *Thomas Was Alone*. [PC Software] UK: Mike Bithell, 2012.
572 Bethesda Softworks *The Elder Scrolls V: Skyrim*. [PC Software] US: Bethesda Softworks, 2011.
573 Calleja, Gordon *In-Game: From Immersion to Incorporation*. London: MIT Press, 2011, p. 43
574 Lucas, Pereia Luis and Licinio, Roque 'Understanding the Videogame Medium Through Perspectives Of Participation'. *Proceedings of the 2014 DiGRA International Conference: DeFragging Games Studies*, 2014.
575 Flanagan, Mary, 2009, p.192.
576 Mar, Raymond and Oatley, Keith, 2008, p. 174.
577 Manovich, Lev, 2001, p.
578 Keogh, Brendan 'Across Worlds and Bodies: Criticism in the Age of Video Games'. *Journal of Games Criticism,* 2014 [Online]. *Available at:* http://gamescriticism.org/articles/keogh-1-1/. [Accessed: 8th August 2018].
579 Baker, Malcolm and Richardson, Brenda *A Grand Design: The Art of the Victoria and Albert Museum*. London: Victoria and Albert Museum, 1997.
580 De Wildt, Lars 'Playing The Other: Role-playing religion in videogames'. *European Journal of Cultural Studies* 21 (3), 2018.
581 Roth and koenitz 'eudaimonic appreciation'
582 Salen, Katie and Zimmerman, Eric, 2004, p.117.
583 Roth and koenitz again
584 Stojnic, Aneta 'Digital anthropomorphism'. *Performance Research* 20 (2), 2015, pp. 70 – 77.
585 Keogh, Brendan, 2014.
586 Flanagan, Mary, 2009, p.150.
587 Iacovides, Ioanna *et al.* 'Removing the HUD: The Impact of Non-Diegetic Game Elements and Expertise on Player Involvement'. *Proceedings of the 2015 Annual Symposium on Computer-Human Interaction in Play*, 2015, pp. 13 -22.

such as game interfaces[588][589][590][591][592][593], and extra-textual knowledge of the form's conventions, cultures and norms[594][595][596].

As well as such universal elements, however, characters in comp-art possess 'intramedial'[597], mode-specific[598] qualities; a 'formal poetics'[599] 'particular'[600] to the form. Above all else, the material 'text'[601] of comp-art is defined by the 'mode'[602] of the computational, supported by the general 'medium [of] binary code' executed by an 'electronic computational device'[603]. The computational mode constitutes the 'integrat[ion]'[604] and 'transcod[ing]'[605] of information into computable 'data'[606] arranged encyclopedically[607] in a 'data container'[608] within the device, and thus manipulated and transformed further in a 'process'[609][610] or 'signal'[611] according to 'specific codified rules of operation'[612], and often relayed to the audience by means of output media such as screens or speakers[613].
The computational mode, and thus the 'text', is no longer a static collection of media, but an authored 'engine'[614] producing an emergent[615], simulatory[616] 'instantiation'[617] defined by the 'operable arguments'[618]

588 Keogh, Brendan *On The Beginner's Guide*, 2015 [Online]. Available at: https://brkeogh.com/2015/10/03/on-the-beginners-gude/ [Accessed: 8th August].
589 Miller, Kiri 'The Accidental Carjack: Ethnography, Gameworld Tourism and Grand Theft Auto'. *Game Studies* 8(1), 2008.
590 Newman, James 'The Myth of the Ergodic Videogame'. *Game Studies* 2 (1), 2002.
591 Galloway, Alexander, 2006, p.14.
592 Wesp, Edward, 2012.
593 Seraphine, Frederic 2016.
594 Werner, Wolf *et al*, 2009.
595 Salen, Katie and Zimmerman, Eric, 2004,
596 Bourgonjon, Jeroen 'The Meaning and Relevance of Video Game Literacy'. *Comparative Literature & Culture* 16 (5), 2014, p. 8.
597 Ibid.
598 Kahurlahti, Veli-Matti 'Defining The Videogame'. *Game Studies* 15 (2), 2015, [Online]. Available at: http://gamestudies.org/1502/articles/karhulahti [Accessed 8th August 2018].
599 Galloway, Alexander, 2006, p. 113.
600 Keogh, Brendan, 2015.
601 Lotman, Yuri, 1977.
602 Ryan, Marie-Laure, 2014.
603 Galloway, Alexander R *Gaming: Essays in Algorithmic Culture*. London: University of Minneasota Press, 2006.
604 Neitzel, Britta *Narrativity of Computer Games,* 2014 [Online]. Available at: http://www.lhn.uni-hamburg.de/article/narrativity-computer-games [Accessed 8th August 2018].
605 Manovich, Lev, 2001, p. 47.
606 Fuller, Matthew 'Data'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp. 125 – 126, p.125.
607 Murray, Janet, 1997, p. 101.
608 Paul, Christiane 'Database'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp. 127 – 130, p.127.
609 Malaby, Thomas 'Beyond Play: A New Approach To Games'. *Games and Culture* 2 (2), 2007, pp. 95 – 113, p. 95.
610 Ascott, Roy and Edward Shanken (*eds.*) *Telematic Embrace: Visionary Theories of Art, Technology and Consciousness*. Berkeley: University of California Press, 2003.
611 Manovich, Lev, 2001,
612 Galloway, Alexander, 2006, p.5.
613 Therrien, Carl 'Interface'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp. 305 – 309, p.305.
614 Murray, Janet, 1997, p. 88.
615 Tronstad, Ragnhild 'Emergence'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp. 179 - 183, p.179.
616 Frasca, Gonzalo 'Simulation versus Narrative'. In: Wolf, Mark and Perron, Bernard (*eds.*) *The Videogame Theory Reader*. New York: Routledge, 2003.
617 Koenitz, Hartmut *et al.*, 2015, p. 98.
618 Bogost, Ian, 2015.

performed: creating what Bogost calls a 'procedural rhetoric'[619], a meaning-making arising, at least in part, from the 'unpredictable nature of [the] complex systems'[620].

Often such systems explicitly allow the audience themselves not merely to observe the emerging representation, but to 'intervene in a meaningful way'[621]: by using a 'technical interface'[622][623] which converts their physical actions into data parseable by the machine[624][625], the audience (either singly or multiply[626]) is often able to 'intentionally influence salient aspects'[627] of the representation and 'push... into the system'[628], either 'explor[ing]' that system or 'ontological[ly]' manipulating its data themselves, thus materially performing the narrative 'instantiation'[629]. Such interactivity is often considered a 'new relationship between artist and observer'[630], 'the unique cultural discovery of the electronic age'[631]. These are deeply suspect claims, ignoring the role of performance and interaction in other artforms[632][633][634][635][636], the heritage of participatory performance art in the development of computational design[637][638], its deliberate exclusion from many works of comp-art[639][640][641][642] and the 'slippery... ambiguous and ill-defined'[643] nature of the term 'interactivity' itself. However, its 'explicit'

619 Bogost, Ian, 2017.
620 Anthropy, Anna and Clark, Naomi *A Game Design Vocabulary: Exploring The Foundational Principles Behind Good Game Design*. Boston: Addison-Wesley, 2014, p.184.
621 Cameron, Andy *Dissimulations: Illusions of Interactivity*, 1995 [Online]. Available at: http://infotyte.rmit.edu.au/rebecca/html/dissimula-tions [Accessed 8th August 2018].
622 Dreher, Thomas *History of Computer Art*, 2015 [Online]. Available at: http://iasl.uni-muenchen.de/links/GCA_Indexe.html [Accessed 8th August 2018].
623 Mondloch, Kate, 2014, p.149.
624 Hansen, Mark *Bodies In Code: Interfaces with Digital Media*. London: Routledge, 2006.
625 Therrien, Carl, 2014.
626 Pearce, Celia 'Online Game Communities'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp. 367 – 370, p.368.
627 Roth and koenitz again
628 Anthropy, Anna and Clark, Naomi, 2014, p. 137.
629 Koenitz, Hartmut *et al,*, 2015, p. 98.
630 Grau, Oliver, 2003, p.9.
631 Laurel, Brenda, 1993, p.28.
632 Flanagan, Mary, 2009.
633 Edmond Jones, Robert *The Dramatic Imagination: Reflections and Speculations on the Art of Theatre*. London: Routledge, 2004.
634 Mondloch, Kate, 2014, p.149.
635 Murray on live theater
636 Jan Simons (2007)
637 Candy, Linda and Ferguson, Sam (*eds.*), 2014.
638 Ryan, Marie-Laure *Narrative As Virtual Reality 2: Revisiting Immersion and Interactivity in Literature and Electronic Media*. Baltimore: John Hopkins University Press, 2015, p. 207.
639 Campbell, Jim *Portfolio (Installations)*, 2018 [Online]. Available at: http://www.jimcampbell.tv/portfolio/installations/ [Accessed 8th August 2018].
640 Cheng, Ian *iancheng*, 2018 [Online]. Available at: http://iancheng.com/ [Accessed 8th August 2018].
641 Newman, James, 2002.
642 Koster, Raph *et al. AI Wish List: What Do Designers Want out of AI?*, 2018 [Online]. Available at: https://www.gdcvault.com/play/1024900/AI-Wish-List-What-Do [Accessed 8th August 2018].
643 Zimmerman, Eric 'Narrative, Interactivity, Play and Games: Four Naughty Concepts in Need of Discipline'. *In:* Pearce, Celia *et al.* (*eds.*) *First Person: New Media as Story, Performance and Game*. Massachusetts: The MIT Press, 2004.

presence[644] in much comp-art, and its prevalence in the literature, demonstrates that in such work 'narrative and interactivity are... intertwined'[645], and the ability of an audience to 'participate in the construction... of narrative in different ways'[646] can be considered sufficiently paradigmatic.

Any artist seeking to build resonant characters in works of comp-art must utilise this 'particular'[647] and complex syntax of toolsets not only as a vessel for their representations, but as an equally 'particular'[648] structure of meaning. A comp-artist still 'projects... a world'[649], just as any narrative artist provokes, semantically, a 'virtual reality'[650] in the autocosmic minds of their audience. A comp-artist is still concerned with the 'holding power'[651] of those realities, their potential for 'immersion'[652], 'incorporation'[653], 'presence'[654][655], involvement[656] and believability[657][658][659], just as audiences are still concerned with those artworks' capacity for (in the words of my playing group) 'complexity', 'hidden layers' and the ability 'to make people care about... subjects, and... subjects' feelings'. However, the nature of such qualities, of such resonance, is a shifting, subjective thing; as much defined by the media and modes in which the work is created as anything else.

Therefore the act of a comp-artist creating character-led narrative works using the mode of computation, and seeking resonance with their audience's non-specific autocosmics through such specific

644 Salen, Katie and Zimmerman, Eric, 2004, p. 69.
645 Koenitz, Hartmut 'Design Approaches for Interactive Digital Narratives'. *In:* Schoenau-Fog, Henrik *et al.* (*eds.*) *Interactive Storytelling: 8th International Conference on Interactive Storytelling*. Heidelberg: Springer, 2015, pp. 50 – 58, p. 52.
646 Flanagan, Mary, 2009 NOT HER
647 Keogh, Brendan, 2015.
648 Keogh, Brendan, 2015.
649 Ryan, Marie-Laure 'Impossible Worlds and Aesthetic Illusion'. *In:* Bernhard, Walter and Wolf, Werner (*eds.*) *Aesthetic Illusion in Literature and Other Media*. Eds. Amsterdam/New York: Rodopi, 2013, pp.131- 148, p.131.
650 Ryan, Marie-Laure, 2015.
651 Turkle, Sherry *The Second Self: Computers and the Human Spirit*. Massachusetts: The MIT Press, 2005, p. 65.
652 Thon, Jan Noel, 2014, p. 269.
653 Calleja, Gordon, 2011.
654 Pinchbeck, Dan 'Ludic Reality: a construct for analysing meaning-mapping and epistemology in play '.
655 Tamborini, Ron and Skalski, Paul. 'The Role of Presence in the Experience of Electronic Games'. *In:* Vorderer, Peter and Bryant, Jennings (*eds.*) *Playing video games: Motives, responses, and consequences*. New Jersey*:* Lawrence Erlbaum Associates Publishers, 2006, pp. 225-240.
656 Ibid.
657 Loyall, Bryan A. *Believable Agents: Building Interactive Personalities*. [PhD Dissertation]: Carnegie Mellon University, 1997.
658 Fogg, B.J. and Tseng, Shawn 'Credibility and Computing Technology'. *Communications of the ACM* 42 (5), 1999, pp.39 – 45.
659 Lankoski, Petri and Bjork, Staffan 'Gameplay Design Patterns for Believable Non-Player Characters'. *Proceedings of the DiGRA 2007 Conference: Situated Play*, 2007.

means, is engaged in an act of computational characterisation: a partial representation of non-actual personhood that uses the computational mode in some manner to (drawing at least initially on classical tenets of aesthetic work[660]) form, represent and express that personhood resonantly.

Such characters take many forms. Most commonly, these include 'system-based artworks... exhibit[ing] autonomous behaviours and... intentions'[661], 'computational entities that... interact... with human beings'[662]; 'sociable machines'[663][664]; or, more prosaically (and contestedly[665]) artificial intelligence[666]. Some, such as the recently-dead scientists and soldiers of first-person shooter *Doom 3*[667] or the character of Henry David Thoreau's sister Sophia in 'heritage game' *Walden: A Game*[668], derive their computational resonance not from being dynamically computational *themselves*, as formal entities, but from functioning as static, mediated elements within a wider computational paradigm or environment. Other comp-artworks take a more Formalist, narrative-focussed approach, using the computational mode to build 'drama' or 'experience' managers[669][670] which compute dramatic structures, plots, genre conventions and narratological procedures rather than individual character's personhoods[671][672][673]. Perhaps the most successful example of this remains the 12-year-old interactive drama *Façade*[674]*;* it has proved a challenging methodology[675]. Other examples include computational characters controlled by real people, whether the audience member themselves or other audience members in a networked work of comp-art[676]; as Appendix 3 illustrates, such characters lie outside the purview of this thesis.

660 Slater, Barry, 2018.
661 Candy, Linda and Ferguson, Sam(*eds.*), 2014, p. 3.
662 Turkle, Sherry 'Artificial Intelligence At 50: From Building Intelligence to Nurturing Socialbilities'. *Proceedings of Dartmouth Artificial Intelligence Conference*, 2006.
663 Brazeal, Cynthia *Designing Sociable Robots*. Massachusetts: The MIT Press, 2002.
664 Kidd, Cory *et al.* 'Effect of a robot on user perceptions'. *Proceedings of IROS 2004:* Sendai, 2004.
665 Nucl.ai *The Principles Of Modern Game AI*, 2015 [Online]. Available at: https://courses.nucl.ai/ [Accessed: 8th August 2018].
666 Russell, Stuart and Norvig, Peter, 2009, p.
667 Id Software *DOOM 3.* [PC Software] US: Activision, 2004.
668 Fullerton, Tracy *et al. Walden: A Game* [PC Software]. US: USC Games, 2017.
669 Reidl, Mark *et al.*, 2011.
670 Hartmut, Koenitz *et al.* 'Introduction: A Concise History of Interactive Digital Narrative'. *In:* Koenitz, Hartmut *et al.* (*eds.*), 2015, pp. 9 - 21, p. 18.
671 Bringsjord, Selmer, 2001.
672 Digital Media ref 1 for this.
673 Digital Media ref 2 for this.
674 Mateas, Michael and Stern, Andrew 'Facade: An Experiment in Building a Fully-Realized Interactive Drama'. Game Developer's Conference:, 2003.
675 Mani, Inderjeet, 2014.
676 Ariosoto

Perhaps the most paradigmatic approach – and the one which I have followed most centrally with Project `knole` – cleaves to the 'post-classical', 'character-focussed'[677] theories outlined in Chapter 1, in which characters are perceived as 'perdurant'[678], individual, complex and hermetic individuals; in other words, as 'intelligent agents'[679680681]. In such an approach, the methodological and formal is tied to the theoretical; representations of characters are constructed so as to be, in procedural simulation, complex individuals featuring some of the elements 'central to personhood'[682]; most commonly memories, emotions[683], 'reciprocity' and social interaction[684], 'personality'[685] and, perhaps most importantly, agency: the ability to in some way 'change, and create and pursue goals'[686]. In its simplest terms, Project `knole` is a narrative work of comp-art centred around an agent-based computational character: Anne's 'spyrit'. It uses the tenets of computation to represent many of the qualities of personhood described above, featuring a simple emotional model[687], subdoxastic reactions to stimuli[688], the encoded apparatus of decision-making, and a simulated embodiement. I chose this approach originally not only because of its endorsement of my own theories of character and narrative, but also because of its popularity and pedigree for simulating personhood computationally, including non-player characters in videogames[689690], robots[691], 'virtual humans' and 'interactive, intelligent agents' in works of heritage interpretation and research[692693694].

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677 Currie, Gregory, 2009, p.61.
678 Lewis, David Kellogg, 1986.
679 Bickmore, Timothy *et al. Proceedings Of The 14th International Conference on Intelligent Virtual Agents.* Boston: IVA, 2014.
680 Mar, Raymond and Oatley, Keith, 2008, p.
681 Machidon, Octavian *et al.*, 2016.
682 Bringsjord, Selmer ' Is It Possible to Build Dramatically Compelling Interactive Digital Entertainment (in the form, e.g., of computer games)?'. *Game Studies* 1 (1), 2001.
683 Afonso, Nuno and Prada, Rui 'Agents That Relate: Improving The Social Believability Of Non-Player Characters in Role-Playing Games'. *Proceedings of ICEC 2008*, 2008.
684 Gouldner, Alvin 'The Norm of Reciprocation: A Preliminary Statement'. *American Sociological Review* 25, 1960, pp. 161-178.
685 Afonso, Nuno and Prada, Rui, 2008.
686 Russell, Stuart and Norvig, Peter, 2009, p.
687 See Appendix #9, Figures 17a – 17e.
688 See Appendix #9, Figure 18
689 Afonso, Nuno and Prada, Rui, 2008.
690 Tronstad, Ragnhild ' NPC (Nonplayer Character)' *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp. 363 – 365.
691 Brazeal, Cynthia, 2002
692 Graham, Shawn 'On Games that Play Themselves Agent based models, archaeogaming, and the useful deaths of digital Romans'. *In:* Mol, Angus *et al.*, 2017, pp.123 – 131.
693 Ch'ng, Eugene *et al.* 'Simulation and Visualisation of Agent Survival and Settlement Behaviours in the Hunter-Gatherer Colonisation of Mesolithic Landscapes'. *In:* Ch'ng, Eugene *et al.* (*eds.*) *Visual Heritage in the Digital Age.* London: Springer, 2013, pp. 235 – 258.
694 Rodrigues, Sergio Hortas *et al.* 'A Process Model of Empathy For Virtual Agents'. *Interacting With Computers* 27 (4), 2015, pp. 1 – 21.

Whatever their construction, computational characters court the autocosmics of their audiences not just as 'active readers'[695] of static texts, but as 'operator[s]'[696][697] and 'participa[nt]s… in… cybernetic circuit[s]'[698], 'interaction trajectories'[699] which ergodically[700] *produce* texts or, in Benford and Giannachi's words, 'trajectories'[701]; 'dynamic syuzhets'[702][703] from authored fabulas of varying determinacy. These circuits, their resultant texts and the communicative acts which they entail thus become complex, interpenetrated sites of resonance and imaginative engagement, interpretation or 'incorporation'[704], creating 'beauty and meaning'[705] through characterisation by their own means of 'expressive processing'[706]. These engagements include those with the structures of the database; with the 'coherent'[707] rulesets, 'dynamics' or 'mechanics'[708][709] which manipulate and control them; with the operation of those rulesets through interfaces; with the resultant procedural performances and signifying actions of both audience and system[710][711][712][713][714] in their 'cybernetic relationship'[715], whether 'canonically' designed to occur or unexpected entirely[716]; away from direct engagement through 'offline', 'macro'

695 Flanagan, Mary,
696 Galloway, Alexander, 2006, p.5.
697 Bogost, Ian, 2017.
698 Calleja, Gordon, 2011, p.2.
699 Benford, Steve and Giannachi, Gabriella, 2011, p.
700 Aarseth, Espen. *Cybertext: Perspectives on Ergodic Literature.* Baltimore: John Hopkins University Press, 1997.
701 Benford, Steve and Giannachi, Gabriella, 2011, p.
702 Wood, Hannah 'Dynamic Syuzhets: Writing and Design Methods for Playable Stories'. *Proceedings of the International Conference on Interactive Digital Storytelling*, 2017, pp. 24 – 37.
703 Nietzel, Britta, 2014.
704 Calleja, Gordon, 2011.
705 Zimmerman, Eric 'Manifesto for a Ludic Century'. *In:* Walz, Steffen and Deterding, Sebastian (*eds.*) *The Gameful World: Approaches, Issues, Applications.* Cambridge: The MIT Press, 2014, pp. 19 – 24, p. 22.
706 Wardrip-Fruin, Noah *Expressive Processing: Digital Fictions, Computer Games and Software Studies.* Massachusetts: The MIT Press, 2009.
707 Benford, Steve and Giannachi, Gabriella, 2011, p.
708 Hunicke, Robin *et al.* 'MDA: A Formal Approach to Game Design and Game Research'. *Proceedings of the AAAI Workshop on Challenges in Game AI* 4 (1), 2004.
709 Hartmut, Koentiz, 2015, p. 91.
710 Candy, Linda and Ferguson, Sam (*eds.*), 2014.
711 Penny, Simon 'Robotics and Art, Computationalism and Embodiment'. *In:* Herath, Damith *et al.* (*eds.*) *Robots And Art: Exploring an Unlikely Symbiosis*. Singapore: Springer, 2016, pp. 47 - 65.
712 Laurel, Brenda, 1993.
713 Dalsgard, Peter and Hansen, Lone Koefoed 'Performing Perception – Staging Aesthetic of Interaction'. *ACM Transactions of Computer-Human Interaction* 15 (3), 2008, pp. 13 – 46.
714 Vella, Daniel 'No Mastery Without Mystery: Dark Souls and the Ludic Sublime'. *Game Studies* 15 (1), 2015.
715 Mullaney, Brett *The Greatest Art Form: Video Games and the Evolution of Artistic Expression.* CreateSpace, 2013.
716 Benford, Steve and Giannachi, Gabriella, 2011, p.

engagement[717], 'historic' recall[718] and 'synoptic' judgement[719][720]; in totality, as a holistic, complex and multifaceted 'involvement'[721][722].

Specifically for characters, the very core of these narrative texts and interpretative acts, 'particular'[723] opportunities for engagement arise: presenting interesting opportunities for 'significant relationships'[724] between characters and audiences; 'co-presence'[725] with an 'intimate machine'[726] or potential 'discussion partner'[727] or 'social partner'[728] that goes beyond the parasocial and becomes truly social[729][730], leading audiences to experience personally-oriented emotions such as pride, shame and guilt as a direct result of their own actions, potentially opening fresh lines of enquiry, understanding, empathy and engagement[731][732]. The signification of the algorithmic processes and systems that lie at the heart of such characters – the perceivable patterns and structures by which they operate - provide a 'particular'[733] way to understand and represent the functioning of the complex 'cosmos' in which characters exist[734]: directly utilising human sensitivity to relational elements, underlying patterns and systemic affordances in environments to create 'deeper understandings'[735], 'metaphors'[736] and 'emotional nuance'[737] for the complex beings, relationships and social processes that lie at the heart of all stories, and form their autocosmic orientation. For Frasca, the systemic and the

717 Newman, James, 2002.
718 Benford, Steve and Giannachi, Gabriella, 2011, p.
719 Calleja, Gordon, 2011, p.4.
720 Videogame spaces bok - "Chapter 2 - "the basis from which a retelling of a game experience is created. This retelling is outside the framework of the game""
721 Newman, James, 2002.
722 Calleja, Gordon, 2011, p.4.
723 Keogh, Brendan, 2015.
724 Significant relationships
725 Calleja, Gordon, 2011, p.4.
726 Frude, Neil and Jandric, Petar 'The Intimate Machine – 30 Years On'. *E-Learning & Digital Media* 12 (3-4), 2015, pp. 410 – 424.
727 Crane, Susan, 2012, p. 308.
728 Machidon, Octavian *et al.*, 2016, p. 250.
729 Banks, Jaime and Bowman, Nicholas David 'Avatars are (sometimes) people too: linguistic indicators of parasocial and social ties in player-avatar relationships'. *New Media & Society* 18 (7), 2016, pp. 1257 – 1276.
730 Gouldner, Alvin, 1960.
731 Tavinor, Grant, 2007, p. 142.
732 Bown, Oliver, 2014.
733 Keogh, Brendan, 2015.
734 Lantz, Frank 'Foreword' *In:* Salen, Katie and Zimmerman, Eric, 2004, p.x.
735 Reed, Aaron *In:* Stuart, Keith *Video games where people matter? The strange future of emotional AI,* 2016, [Online]. Available at: https://www.theguardian.com/technology/2016/oct/12/video-game-characters-emotional-ai-developers [Accessed 8th August 2018].
736 De Lucena, Daniel Pettersen and Da Mota, Rosilane Ribeiro 'Games as expression - On the artistic nature of games'. *Proceedings of SBGames.* Curitiba, Brazil: SB Games, 2017, pp. 812- 822, p. 813.
737 Bogost, Ian, 2015.

computational can teach us, in their own narratising manner, what it means to be human[738].

This potential to engage audiences in an act of constructive, autocosmic participation with computational character remains an obsession for comp-art culture. Many frameworks, theories, advocacies and artworks exist as evangelising examples of the 'new possibilities in art and entertainment'[739] for 'unique aesthetic experiences'[740], 'new models of character, story and language'[741] and an 'expan[sion of] the catalog of narrative modalities'[742] to 'deliver… radically new forms of art… and social experiences'[743] and 'augment and afford experiential understanding'[744]. While terms such as 'new' and 'unique' are troublesome when one considers the venerability of the human autocosmic response which all art draws upon - terms which are tinged with a utopianism and triumphalism that often infects discourse[745] - it seems clear that there exists, at the very least, a potential to undertake this ancient act of communication between author and audience in a 'particular' manner, and to 'particular'[746] ends. In his audience-centred, psychologically-driven thesis of literary significance, theorist Keith Oatley frames books as simulations run on minds, just as computer simulations run on computers[747]. In comp-art, this computation of audience engagement is partnered with the computation of the artwork itself: a systemic, rather than merely mimetic, representation[748]. It is from this partnership and interplay of computations and communications, of these two sorts of Suzanne Keen's 'unpredictable afterwards'[749], that computational character draws much of its power.

Project `knole` is an attempt to achieve my own, general resonant objectives outlined in Chapter 1 – historical, interpersonal, aesthetic, emotional, social – by using the specific qualities of the computational mode. It is perhaps the greatest methodological challenge

738 Frasca, Gonzalo 'Simulation versus Narrative: Introduction to Ludology'. *In:* Wolf, Mark and Perron, Bernard (*eds.*) *The Video Game Theory Reader*. New York: Routledge, 2003.
739 Mateas, Michael. 'Interactive drama, art and artificial intelligence'. [PhD Thesis]. Pittsburgh: Carnegie Mellon University, 2002.
740 De Lucena, Daniel Pettersen and Da Mota, Rosilane Ribeiro, 2017, p. 816.
741 Wardrip-Fruin, Noah, 2009, p.2.
742 Ryan, Marie-Laure, 2001.
743 Ryan, Marie-Laure 'Preface'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, p. ix.
744 Champion Otherness of Place
745 Pressman, Jessica 'Old Media/New Media'. *In:* Ryan, Marie-Laure (*eds.*), 2014, pp. 365 – 366.
746 Keogh, Brendan, 2015.
747 Oatley, Keith, 2008.
748 Galloway, Alexander, 2004, p.72.
749 Keen, 2011, p. 300.

that I have ever faced as an artist. I began my career as a writer of prose; gradually shifting to the computational mode through the implementation in my work of techniques from transmedia narrative[750], interactive fiction and games design[751]. `knole`, with its thousands of lines of code, animated graphical elements and simulatory models of personhood, represents a significant step beyond my usual practice. However, it is not only an attempt to improve my skills and widen my repertoire: it is (quite literally) a face-to-face confrontation with the struggles of computational character to achieve its own 'particular'[752] potential over its still-lengthening history.

750 Sherman, Rob *The Black Crown Project Archive*, 2018 [Online]. Available at: https://github.com/bonfiredog/blackcrownproject [Accessed 8th August 2018].
751 Sherman, Rob *The Spare Set*, 2014 [Online]. Available at: http://bonfiredog.co.uk/thespareset [Accessed 8th August 2018].
752 Keogh, Brendan, 2015.

Section 2.2: The Challenges of Computational Characterisation

Given its role as 'the Holy Grail of digital entertainment'[753], art and education, its 'ultimate goal'[754], it is no surprise that the creation of resonant computational characters and their narratives has been a perennial topic of discussion, lambast and productive tension since the form's beginnings. Such characters remain 'one of the big challenges of modern computing'[755][756], 'as elusive as [they are] enticing'[757] and subject to fundamental difficulties and 'open problems'[758] that are 'particular'[759] to the form[760][761].

For some, these challenges are always productive; for others, they threaten 'the viability of interactive digital storytelling'[762] itself, relegating comp-art to '[playing] second fiddle to cinema, literature [and] music'[763] as a narrative artform, in which 'the best... stories are still worse than even middling books and films'[764]. Criticisms range from practitioners lamenting, as recently as 2013, that videogames can create more believable

753 Ryan, Marie-Laure 'Interactive Narrative'. *In:* Ryan, Marie-Laure *(eds.)* *The John Hopkins Guide To Digital Media.* Baltimore: The John Hopkins University Press, 2014, pp. 292-297, p.292.
754 Machidon, Octavian *et al.*, 2016, p. 250.
755 Alderman, Naomi *Why can't we talk to the characters in games? Careful what you wish for...*, 2016 [Online]. Available at: https://www.theguardian.com/technology/2016/jan/11/games-computers-conversation-characters [Accessed 8th August 2018].
756 Machidon, Octavian *et al.*, 2016, p.249.
757 Ryan, Marie-Laure, 2014, p. 292.
758 Mark Reidl
759 Keogh, Brendan, 2015.
760 Short, Emily *Conversation*, undated [Online]. Available at: https://emshort.blog/how-to-play/writing-if/my-articles/conversation/ [Accessed 8th August 2018].
761 Millington, Ian and Funge, John *Artificial Intelligence for Games.* Massachusetts: Morgan Kaufman, 2009.
762 Rank, Stefan and Petta, Paolo 'Backstory authoring for affective agents'. *Proceedings of the 5th International Conference on Interactive Storytelling*. San Sebastian: ACM Digital Library, 2012.
763 Samyn, Michael *Almost Art*, 2011 [Online]. Available at: http://www.escapistmagazine.com/articles/view/video-games/issues/issue_291/8608-Almost-Art [Accessed 8th August 2018].
764 Bogost, Ian, 2017.

guns than people[765]; to charges of producing 'wooden cutouts'[766] which are 'shallow, static and lacking in believability'[767]; to virtual heritage specialists criticising the difficulties of achieving 'social presence' in the virtual spaces at the centre of their interpretations[768][769][770]; to audiences themselves, including members of my study group, criticising the computational characters they encounter as 'distant', 'stupid', 'forgettable', 'uninteresting', 'predictable', 'confusing' or 'unbelievable'.

The participants in my study were, on the whole, optimistic about the future of characterisation in comp-art; believing that, 'with enough space and time', practice would improve. Others writing on the subject are not so sure about this 'hypothetical future'[771], and resurrect older debates about the role of narrative in comp-artforms such as videogames[772][773][774]; asking provocative questions about whether comp-art is really an appropriate tool for representing character and narrative at all[775][776][777][778].

Such criticisms can be considered under the same aegis as those comments made of literary and filmic characters in Chapter 1, if not with a greater degree of desperation. Computational character, it seems, is subject to a basal, historic challenge of resonance; namely, a challenge in making characters *both* meaningfully computational and resonant with the general autocosmic faculties of their audience. It is this challenge which is central to this thesis: however, it is such a multifarious and complex debate that a full account of it is beyond my remit. In review, however, certain trends can be identified. The nexus of the challenge lies in formal consideration of the

765 Mark, Dave *et al. Never Mind Small Steps: What's The Giant Leap For AI?,* 2013 [Online]. Available at: http://www.gdcvault.com/play/1018056/Never-Mind-Small-Steps-What [Accessed 8th August 2018].
766 Hruska, Joel *The Quest To Improve Videogame* AI, 2016 [Online]. Available at: https://www.magzter.com/articles/1642/143107/56a26114033e9 [Accessed 8th August 2018].
767 Koenitz, Hartmut *et al*, 2015, p. 2.
768 Champion, Erik 'Social Presence and Cultural Presence in Oblivion'. *Proceedings of the 7th International Digital Arts and Culture Conference: The Future of Digital Media Culture,* 2007.
769 Tan, Beng Kiang and Rahaman, Hafizur 'Virtual heritage: Reality and criticism'. *Proceedings of the 2009 CAADFutures Conference.* Montreal, 2009, pp. 143 – 156, p. 148.
770 Machidon, Octavian *et al.* 'Virtual humans at cultural heritage ICT applications: A review'. *Journal of Cultural Heritage* 33 (1), 2018, pp. 249 – 260.
771 Bogost, Ian, 2017.
772 Koenitz, Hartmut *et al.*, 2015, p. 69.
773 Kokonis, Michalis 'Intermediality between Games and Fiction: The "Ludology vs. Narratology" Debate in Computer Game Studies: A Response to Gonzalo Frasca' .*Film and Media Studies* 9, 2014, pp. 171 – 188.
774 Ryan, Marie-Laure, 2015.
775 Bogost, Ian, 2015.
776 Bogost, Ian, 2017.
777 Jull, Jesper 'Games telling Stories? A brief note on games and narratives'. *Game Studies* 1 (1), 2001.
778 Eskenlinen, Markku 'The Gaming Situation'. *Game Studies* 1 (1), 2001.

computer itself, its 'internal affordances'[779], and 'prototypical qualities'[780]; and the cultural issues, in the comp-artforms themselves, to which such formal issues inevitably and naturally give rise and interpenetrate.

Project `knole`, both in its form and fiction, explores the fundamental 'technical limitations'[781] of the computational mode; limitations that arise from the 'formality gap'[782] in comp-art's communication of complete worlds through incomplete representation: the translation, as Simon Penny has it, of 'atoms into bits'[783]. Anne is likewise concerned with the incommunicability of the 'actual' world around her; a world which was for most people (particularly, as Anne notes bitterly, women[784][785][786]) still overwhelmingly complex and ultimately unpredictable[787]. It is a world where explanation, simplification and the ability to control and influence the ineffable and inexplicable are highly sought; whether through the practice of modern (and ancient) scientific enquiry or the parallel traditions of magic[788][789]. To Anne, the 'spyrit' represents a middle ground between these two approaches; something which has the form, and many of the trappings, of the 'familiar spirits' of witches and cunning folk in previous centuries[790], but which operates less along mystical or bestial lines and more according to the bempirical and rational, mechanistic principles that were increasingly coming to define contemporary life[791][792]. In its self-contained, idealised and virtual 'relm', and through strictly-prescribed interactions with the real world mediated by the installation's mixed reality dynamic[793] and Anne's ritual instructions, the creature provides a bounded, mechanomorphic servant and interface which furnishes Anne with the agency to influence, and instrumentalise, the naturalistic chaos which has previously ruled her life. Operated little

779 Copplestone, Tara, 2017, p. 88.
780 Thon, Jan-Noel, 2014, p. 334.
781 Parry, Ross, 2010, p.
782 Dix, Alan *et al.* 2004, p. 232.
783 Penny, Simon, 2016, p.61.
784 Hill, Bridget (*eds.*) *Eighteenth Century Women: An Anthology*. Oxon: Routledge, 2013.
785 Sollee, Kristen J. *Witches, Sluts, Feminists: Conjuring the Sex Positive.* Berkeley: Stone Bridge Press, 2017.
786 Solee
787 Harding, Roberta 'Rubbing the Rabbit's Foot: Gallows Superstitions and Public Healthcare in England during the Eighteenth and Nineteenth Centuries'. *Boston University Public Interest Law Journal* 25 (2), 2016.
788 Davies, Owen, 2008, p. 105.
789 Davies, Owen, *Grimoires*: A History of Magic Books. Oxford: Oxford University Press, 2009.
790 Wilby, Emma, 2000.
791 Armitage, Angus 'Rene Descartes (1596 – 1650) and the Early Royal Society'. *Notes and Records of the Royal Society of London* 8 (1), 1950, pp. 1 – 19.
792 Bristow, William 'Enlightenment'. *In:* Zalta, Edward (*eds.*) *The Stanford Encyclopedia of Philosophy*, 2017 [Online]. Available at: https://plato.stanford.edu/archives/fall2017/entries/enlightenment [Accessed 8th August 2018].
793 Benford, Steve and Giannachi, Gabriella, 2011.

differently from the 'stations', or machines, that Anne worked while employed at Elijah Knole's mill, this 'moderne' beast is a prescience of a future to come; a 'Newly Age' of honest work, mechanised predictability, denatured 'Troth' and control.

Of course, Anne's confidence in these correlations, in her 'Troth', is misplaced. The creature is just an animal, and not a supernatural tool of emancipation; the simplistic structures of her rituals are drawn from material in her own psychological universe and her misunderstanding of the principles of Gravity, rather than any objectively 'Viewed' reality; in each case her attempts to control the world around her through the mechanisms of the 'spyrit' (particularly to avoid her own pregnancy) come undone. Like the work of other 'cunning folk', her rituals with the creature rely on imaginative sense-making far more than any true systemic causation[794][795]. In her work, Anne has not overcome the complexity of the world; she has reductively ignored it.

In comp-art, there is often a similar mismatch between the partial, computational representation of the storyworld and its characters on one hand, and the complexity of that 'non-actual' storyworld *in summa* on the other. As the previous section outlined, comp-art's major representational tool is the computational paradigm. It has the potential to manufacture not just static reproductions of the elements of personhood, but a procedural simulation of personhood in process: that is, demonstrating something, through systems, of the *functionality* of personhood.

In other artforms, this functionality – the actual procedures of characters living and interacting – is computed in Keith Oatley's original 'simulator'[796]: the embodied, autocosmic minds of the various authors and audiences of the narrative experience. The author decides what characters will do and say; the film editor slices and predetermines the shots; the improvisational performers draw on their own human experiences to calculate their output[797][798]; the audience receives, responds and shapes. In

794 Bever, Edward *The Realities Of Witchcraft & Popular Magic in Early Modern Europe*. Basingstoke: Palgrave Macmillan, 2008, p. 290.
795 Davies, Owen 2007, p. 110.
796 Oatley, Keith, 2008.
797 Koentiz, Hartmut *et al.*, 2015, p.
798 Murray on computational theater

each case, as Ken Perlin points out[799], it is the human mind which undertakes this calculation; a tool evolved to execute these 'complicated recursive systems'[800], the 'subjectively ambiguous'[801], instinctive and often ineffable processes by which beings function; functionalities such as social conflict[802], learning and emotion, 'interpersonal relationships'[803][804] and 'internal mental... action' - the elements, in short, of drama[805] - whose modelling forms the elusive objective of many disciplines, sciences and enquiries.

When this 'qualitatively variable'[806] 'squishy stuff'[807], as Falstein calls it, is instead (in part) parsed through the rigid[808], 'objectively precise'[809] and 'quantitatively controlling'[810] machine, operated by the flow of electricity through integrated circuitry controlled by transistors which can perform binary logic operations on binary data[811], the fundamental differences between these two different processes become painfully apparent[812][813]. This is particularly exacerbated by the concept of interactivity, in which such fragile systemic representations are open to the unpredictable manipulations of the audience themselves[814]. Douglas Hofstadter, in his early philosophical consideration of natural and artificial intelligence, maintains a 'reductionist faith'[815] that computers can be used to imitate, in a functionally meaningful way, the emergent, systemic complexity of human (read, characterful) intelligence, though the scale of the challenge clearly daunts (and delights) him. His position is emblematic of a tension in the scholarship between those who believe the

799 Perlin, Ken 'Can There Be A Form Between Game And Story?'. *In:* Wardrip-Fruin, Noah and Harrigan, Pat (*eds.*), 2004, p.
800 Hofstadter, Douglas, 2000
801 Hugill, Andrew and Yang, Hongi 'The creative turn: New challenges for computing'. *International Journal of Creative Computing* 1 (1), 2013, pp. 1 – 15, p.
802 Salen, Katie and Zimmerman, Eric, 2004, p.382.
803 Aarseth, Espen ' 'Genre trouble: narrativism and the art of simulation' *In:* Wardrip-Fruin, Noah and Harrigan, Pat (*eds.*) *First person: new media as story, performance, and game*. Cambridge: The MIT Press, 2004, p.
804 Spector, Warren *Narratives in Games – Role, Forms, Problems and Potential*, 2013 [Online]. Available at: https://www.gdcvault.com/play/1018122/Narrative-in-Games-Role-Forms [Accessed 8th August 2018].
805 Ryan, Marie-Laure, 2001.
806 Hugill, Andrew and Yang, Hongji, 2013, p.
807 Koster, Raph, 2018.
808 Hofstadter, Douglas, 2000, p.298.
809 Hugill and Yang, 2013, p.
810 Ibid.
811 Pelzold, Charles *Code: The Hidden Language of Computer Hardware And Software*. USA: Microsoft Press, 1999.
812 Elson, David 'Artificial Intelligence'. *In:* Ryan, Marie-Laure *et al. (eds.)*, 2014, pp. 18 – 22.
813 Hofstadter, Douglas, 2000,
814 Aylett, Ruth 'Emergent narrative, social immersion and "storification".' *Proceedings of the 1st international workshop on narrative and interactive learning environments*. Edinburgh, 2000, pp. 35–44.
815 Hofstadter

'mechanizability'[816] of intelligence – of personhood – is possible[817][818], and those who do not[819][820]. Discussion of such scholastic tensions, still extant today, is beyond my remit here; but even in taking Hofstadter's optimistic position, by his own admission, 'a long road lies ahead'[821]. The length of that road, especially for an impatient artist, remains frustratingly obscure.

It is in reconciling this 'formality gap'[822] – in meaningfully representing the systemic procedurality of characters as 'non-actual' persons with 'vast[ly] discrepan[t]'[823][824] computational tools – that remains the greatest formal challenge to realising truly resonant computational characters as this thesis defines them[825]. It is from this discrepancy that much of the lack of resonance in such characters – their 'narrative dissonance'[826], frequent charges of 'ludological centrism'[827], their lack of believability[828], depth, subtlety, complexity – has arisen. These deficiencies of communication arise, inevitably, from the formal properties of the means of communication. Like Anne's misplaced faith in a simplistic, mechanical 'Troth' behind the complexity of the world, rooted in her second-hand Enlightenment cribbed from her wealthier and more educated clients, the 'formality gap' between the fact of personhood and its computational simulation goes beyond the artful, or the instructive; it becomes reductive.

It was this central issue, these 'enormous limitations'[829], that one of my study participants labelled as the 'pressures of the medium': and it is these pressures, likely to remain inherent to the form, which have in part informed the various artistic, critical and methodological discourses of comp-art culture, the 'external affordances of the discipline'[830] and the

816 Hofstadter
817 Another
818 Another
819 Searle
820 One other
821 Hofstadter, Douglas, 2000,
822 Dix, Alan *et al.* 2004, p. 232.
823 Norman, Donald, 2007.
824 Asma, Stephen, 2017.
825 Ryan, Marie-Laure 'From Playfields To Fictional Worlds: A Second Life for Ariosto'. *New Literary History* 40 (1), 2009, pp.159 – 177.
826 Seraphine, Frederic, 2016.
827 Căşvean, Tulia Maria 'What is Games Studies Anyway? Legitimacy of Game Studies Beyond Ludo-centrism vs. Narrato-centrism Debate'. *Revista Româna de Jurnalism si Comunicare* 11 (1), 2016, pp. 48 – 59.
828 Tence, Fabien *et al.* 'The Challenge of Believability in Video Games: Definitions, Agents Models and Imitation Learning'. France: *GAMEON-ASIA*, 2010, [Online]. Available at: https://arxiv.org/abs/1009.0451v1 [Accessed 8th August 2018].
829 Giner-Sorolla, Roger *Crimes Against Mimesis*, 2005 [Online]. Available at: https://web.archive.org/web/20050619081931/http:/www.geocities.com/aetus_kane/writing/cam.html [Accessed 8th August 2018].
830 Copplestone, Tara, 2017, p.88.

'changing political, social, and cultural contexts in which they are produced and consumed'[831]. In the mainstream videogame industry, perhaps the most common source of narrative characterisation in 'comp-art', and most influential on tangential disciplines (see Appendix 3), they have contributed to a cyclical *status quo* of risk-aversion, narrative conservatism[832] and stagnation[833834835836]; '[the] ringing [of] changes on the same few subjects', methodologies, characters and their fictions[837838839], a 'downgrad[ing]' of narrative sophistication and its implementation computationally[840841], an underdevelopment of tools and techniques for addressing computational character[842843844]: even a bizarre and defeatist surfeit of self-reflexive 'in-jokes' and self-neoteny about those very inadequacies[845846847848]. Even outside such specific criticisms, it appears clear that comp-art faces fundamental challenges to the creation of resonant computational characterisation. These issues, and responses to them, may be distinguished into two categories: those in which computational characters lack resonance as representations of personhood, or in which a (perhaps otherwise resonant) character does not achieve those qualities and responses primarily through computation.

The 'spyrit' at the heart of Project `knole` is designed to represent, in Anne's perceptual universe, a 'character' of the former category: a compliant, infallible, predictable and mechanised example of personhood and animality, drawn from the philosophy of rationalist

831 Kerr, Aphra. *The business and culture of digital Games: Gamework/gameplay*. London: Sage, 2006, p. 4.
832 Anthropy, Anna and Clark, Naomi, 2014, p.10.
833 Smith Ed *Don't Hate The Game, Hate The Player*, 2017 [Online]. Available at: https://www.youtube.com/watch?v=k7aeD1vAYCE [Accessed 8th August].
834 Anthropy, Anna, and Clark, Naomi, 2014, p.xiv.
835 Dyer-Witheford, Nick and de Peuter, Grieg *Games Of Empire: Global Capitalism And Video Games*. Minnesota: University of Minnesota Press, 2009, p. 71.
836 Keogh, Brendan *ungaming*, 2016 [Online]. Available at: http://ungaming.tumblr.com/post/149102772520/i-tweeted-a-link-to-this-article-on-the-bus - about [Accessed: 8th August 2018].
837 Ibid.
838 Ryerson, Liz *Indie Entitlement*, 2014 [Online]. Available at: https://ellaguro.blogspot.com/2014/06/indie-entitlement.html [Accessed 8th August 2018].
839 Majewski, Jakub 'Cultural Heritage In Role-Playing Games: A Map Of Approaches'. *Furnace* 2 (1), 2015, [Online]. Available at: https://furnacejournal.files.wordpress.com/2015/09/majewski.pdf [Accessed 8th August 2018].
840 Newman, James, 2002.
841 Hunicke, Robin *et al.*, 2004, p.
842 Stuart, Keith, 2016.
843 Reed, Aaron *In:* Stuart, Keith, 2016.
844 Smith, Harvey and Worch, Matthias *What Happened Here? Environmental Storytelling*, 2010 [Online]. Available at: http://www.gdcvault.com/play/1012647/What-Happened-Here-Environmental [Accessed 8th August 2018].
845 Williamson, Alan 'Yokosuka, 1986'. *Five Out of Ten* 3 (1), 2014, p.
846 Anthropy, Anna and Clark, Naomi, 2014,
847 Lantz, Frank, 2004, p. xi.
848 Ryan, Marie-Laure, 2015, p. 181.

utilitarianism steeped in the burgeoning Enlightenment values that were transforming society at the time. To its erstwhile mistress, this 'curius Breed of Beest' has none of the dangerous, naturalistic qualities of the beings that surrounded 18th century rural life, whether ornery cattle or the capricious, opaque influence of supernatural entities[849][850]. Instead, Anne treats this 'Newly Beest, some Beest verie Perfeckt' with detachment and a complete disavowal of any underlying personality, moods, emotions or the other troublesome baggage of lived existence. Its only purpose is to 'Work': to be operated, like the machines at Mr. Knole's mill, through a sequence of unambiguous manipulations designed for specific ends: the overcoming of the hated and obscurantist 'Forse' which Anne, in a piecemeal theory drawn from a semi-literate understanding of the principles of Gravity[851], theorises to 'gofern… over all Bodies'. Anne proudly insists that the 'spyrit' makes no 'froth[ing] at the Haltre… nor… any Protest' at such manipulations. So desperate is she to demonstrate her control over her circumstances, and the efficacy of her work, that she willfully ignores the pain, discomfort and (ocassionally) pleasure that the creature experiences when being so manipulated. When Anne states that the creature is the 'Console of the World', she means this in two senses: both as a Saviour for those beset by the opaque influences of the 'Forses' that harry human life, and as a form of depersonalised instrument. To Anne, the 'spyrit' is primarily a control panel for her new agencies, despite the clear evidence of a more complex 'person' existing beneath that servitor role.

Such characters that inhabit Anne's coming utopia – little more than personified functionaries, or 'vending machines'[852] for particular purposes and uses – are representative of those characters in comp-art which use computational techniques to represent personhood systemically, but which fail to create appropriate resonance from these techniques. This failure arises fundamentally from the enormous formal, semantic differences between the *functionality* of personhood and the *functionality* of the computer, and is concretised into deficient practices of 'technological

849 Clark, Stuart. *Thinking With Demons: The Idea Of Witchcraft In Early Modern Europe*. Oxford: Oxford University Press, 1999.
850 Davies, Owen. *Witchcraft, Magic and Culture 1736 – 1951*. Manchester: Manchester University Press, 1999.
851 Newton, Isaac *et al.* (*trans.*) *The Principia: Mathematical Principles Of Natural Philosophy*. London: University of California Press, 1999.
852 Hernandez, Patricia *You Know What's Gross? We Play Nice Guys (tm) In So Many Games*, 2012 [Online]. *Available at: http://nightmaremode.thegamerstrust.com/2012/12/03/you-know-whats-gross-we-play-nice-guys-in-so-many-games/* [Accessed 8th August 2018].

reductionism'[853], focalisation on the 'low-hanging fruit' of simulation[854]and 'mechanical parody'[855].

Examples of such approaches include mechanistic and reductive depictions of romance and social interactions[856][857]; frustratingly stupid 'companion' characters[858]; frequent 'glitches' or incoherences in computational representations of character[859]; the vast number of 'utilitarian [and] transactional' conversation models[860][861][862][863][864]; and the crude 'moral calculus'[865] and 'predictable, solvable problems'[866] of simulations of social reputation, persuasion and faction politics[867][868][869] which remain popular both in the videogames industry and beyond. I witnessed them frequently during my study: from players struggling to reconcile the overtly mechanical, repetitive systems of *Shelter*[870] with its ostensible narrative of animal motherhood, to the lack of interest demonstrated by players in the lives and personhoods of the various characters they encountered in *Skyrim*[871].

In such cases, while characterisation is attempted through systemic means, the resulting characters function 'simpl[y] and dispensibl[y]'[872], with little computational exploration of any inner,

853 Ruffino, Paolo 'Narratives of independent production in video game culture'. *Loading...* 7 (11), 2012, pp.106 – 121.
854 Koster, Raph *et al.,* 2018.
855 Weizenbaum, Joseph *Computer Power and Human Reason: From Judgement to Calculation.* San Francisco: W.H. Freeman, 1977, p.
856 Hernandez, Patricia, 2012.
857 Joho, Jess *Video Games Like 'Mass Effect' Should Just Admit They're Bad at Sex,* 2017 [Online]. Available at: https://motherboard.vice.com/en_us/article/aepnn5/video-games-like-mass-effect-should-just-admit-theyre-bad-at-sex [Accessed 8th August 2018].
858 Tremblay, Jonathan 'Improving Behaviour and Decision Making for Companions in Modern Digital Games'. AIIDE 2013: AAAI, 2013.
859 Lewis, Chris *et al.* 'What went wrong: A taxonomy of video game bugs'. *Proceedings of the Fifth International Conference on the Foundations of Digital Games*: Monterey, 2010, pp. 108 – 115.
860 Bell, Alice *The Fuckeduplet 1: Dialogue in Games is Fucked - Alice Bell.* Videobrains, London, 2016 [Online]. Available at: https://www.youtube.com/watch?v=nWD6bb3AbS8 [Accessed: 8th August 2018].
861 Zhu, Jichen 'Dialogue Systems'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp. 130 – 133.
862 Galloway, Alexander, 2006, p.68.
863 Smith, Adam *Living Worlds: The Joy of NPC Schedules,* 2016 [Online]. Available at: https://www.rockpapershotgun.com/2016/01/06/the-joy-of-npc-schedules/ [Accessed 8th August 2018].
864 Short, Emily *Conversation* [Online]. Available at: https://emshort.blog/how-to-play/writing-if/my-articles/conversation/ [Accessed 8th August 2018].
865 Champion, 2004
866 Kopas, Meritt *Soft Chambers*, 2015 [Online]. Available at: http://softchambers.com/ [Accessed 8th August 2018].
867 Applying Game Design, erik champion
868 Ryan, James Owen *et al.*, 'Towards Characters Who Observe, Tell, Misremember & Lie'. *Experimental AI in Games: Papers from the AIIDE 2015 Workshop,* 2015 [Online]. Available at: https://www.aaai.org/ocs/index.php/AIIDE/AIIDE15/paper/view/11667/11394 [Accessed 8th August 2018].
869 Champion, Erik, 2007.
870 Might & Delight, 2013.
871 Bethesda Softworks, 2011.
872 Ryan, Marie-Laure 'Interactive Narrative, Plot Types & Interpersonal Relations'. *Intersemiose* 2 (4), 2013, pp. 26 - 37, p. 30.

interpersonal life or its 'unique, complex circumstances'[873][874][875][876]. They serve as little more than 'props'[877][878] and 'mere decoration',[879] 'artificial constructs' or 'puppets'[880], 'equipment to be utilised'[881] in the pursuit of less personalised and more 'effectively computable'[882] functionalities. These functionalities include more 'tightly constrained domains'[883]: the 'quantifiable outcomes'[884] and 'challenge-based' goals and 'flows'[885] of 'ludic' or skill-based contests[886][887][888] ; the constructive, 'sandbox' elements of paidic play[889]; Formalist and less character-centric narrative structures[890][891]; and the 'kinaesthetic'[892], 'spatial... temporal relations'[893] used to represent Euclidian space and its 'physical processes'[894]: most often, as in Anne's conceptual universe, focussed on gravity, and its various employments. Such focuses are reinforced and informed by other reductive practises: the prevalence of dehumanising interaction models, particularly through combat[895][896][897]; a methodological undervaluing of opacity, ambiguity and ineffability in computational representative

873 Anthropy, Anna and Clark, Naomi, 2011, p. 185.
874 Koster, Raph *et al.*, 2018.
875 Mol, Angus *et al.*, 2017.
876 Veale, Kevin, 2012.
877 Koster, Raph *et al.*, 2018.
878 Smith, Adam, 2016.
879 Machidon, Octavian *et al.*, 2016, p. 250.
880 Salen, Katie and Zimmerman, Eric, 2004, p.446.
881 Newman, James, 2002.
882 Finn, Ed *What Algorithms Want: Imagination in the Age of Computing*. Massachusetts: The MIT Press, 2017, p. 42.
883 Winston, Patrick 'AI memo no. 366'. [Technical Report]. Massachusetts: MIT, 1976.
884 Salen, Katie and Zimmerman, Eric, 2004, p.93.
885 Cowley, Ben *et al.* 'Towards an understanding of flow in video games'. *Computers In Entertainment* 6 (2), 2008, pp. 20:1 – 20:27.
886 Calleja, Gordon, 2011, p. 52.
887 Thon, Jan-Noel, 2014.
888 Ermi, Laura and Mayra, Frans 'Fundamental Components of the Gameplay Experience: Analysing Immersion'. *In:* de Castell, Suzanne and Jenson, Jennifer (*eds.*) *Changing Views: Worlds In Play. Selected Papers of the 2005 DiGRA 2nd International Conference.* DiGRA, 2005.
889 Paida in sandbox
890 Ryan, Marie-Laure, 2013, p. 30.
891 Brusentsev, Andrew *et al.* 'An investigation of Vladimir Propp's 31 functions and 8 broad character types and how they apply to the analysis of video games'. *Proceedings of The 8th Australasian Conference on Interactive Entertainment: Playing the System.* New York: ACM, 2012, pp. 2:1 – 2:10.
892 Calleja, Gordon, 2011, p. 55.
893 Gernsbacher *et al.*, 'Do Readers Mentally Represent Characters' Emotional States?' *Cogn Emot* 6 (2), 1992, pp. 89-111, p.104.
894 Anthropy, Anna and Clark, Naomi, 2014,
895 Kocurek, Carly 'Who hearkens to the monster's scream? Death, violence and the veil of the monstrous in video games'. *Visual Studies* 30 (1), 2015, pp. 78 – 89.
896 Lindsey, Patrick 'The Immersion Fallacy'. *Five Out Of Ten* 8, 2014,
897 Stuart, Keith, 2016.

systems[898][899][900][901][902][903][904] in favour of 'goal-related engagement'[905]; and the over-emphasis of an audience's instrumental agency[906][907][908][909][910][911], which serves to 'fetishize control'[912]; emphasise reactivity and 'immediate response'[913] over passivity, unpredictability or introspection[914][915].

Represented characters in such works – iconified[916], 'dumb[ed] down'[917], transparent - often demonstrate a clear and 'dissonant'[918] space between their 'non-actual'[919] personhood and their reductive representation[920]. The communication between artefact and autocosmic experience of that artefact – and the resonance of that communication – inevitably suffers in such circumstances.

In the face of such a norm, some works use the ubiquity of these approaches and the 'contemporary standards'[921] of characterisation as a form of self-reflexivity or metalepsis[922], 'critiqu[ing or] subvert[ing]... the original function of the appropriated technology'[923] in order to express particular artistic agendas: a recent example of this applied to

898 McMaster, Michael, 2014.

899 Kopas, Merritt, 2015.

900 Joho, Jess *Video games are creating smarter animals*, 2017 [Online]. Available at: https://www.polygon.com/features/2017/5/17/15442666/videogame-animals-smarter [Accessed 8th August 2018].

901 Ryan, James Owen *et al.*, 2015, p.56.

902 Koster, Raph *et al.,* 2018.

903 Ashwell, Sam Kabo, 2014.

904 Warpefelt, Henrik and Straat, Bjorn 'Breaking immersion by creating social unbelievability'. *Proceedings of AISB 2013 Convention. Social Coordination: Principles, Artefacts and Theories,* 2013, pp. 92-100.

905 Lankoski, Petri 'Player Character Engagement in Computer Games'. *Games & Culture* 6 (4), 2011, pp. 291 – 311, p. 291.

906 Kabo Ashwell, Sam, 2014.

907 Anthropy, Anna and Clark, Naomi, 2011, p.48.

908 Flanagan, Mary, 2009, p. 185.

909 Dyer-Witheford and de Peuter, Grieg, 2009, p.

910 Brice, Mattie *Death of the Player*, 2013 [Online]. Available at: http://www.mattiebrice.com/death-of-the-player/ [Accessed 8th August 2018].

911 Smith 2017

912 Galloway, Alexander, 2006, p.93.

913 Ryan, Marie-Laure, 2001.

914 Bogost, Ian *Proteus: A Trio of Artisanal Game Reviews*, 2013 [Online]. Available at: http://bogost.com/writing/proteus/ [Accessed: 8th August 2018].

915 Keogh, Brendan, 2014.

916 Majewski, Jakub, 2015, p.2.

917 Roberts, David *et al.* 'Beyond Adversarial: The Case for Game AI as Storytelling'. *Proceedings of DiGRA 2009.* DiGRA, 2009.

918 Hocking, Clint *Ludonarrative Dissonance In Bioshock*, 2007 [Online]. Available at: https://clicknothing.typepad.com/click_nothing/2007/10/ludonarrative-d.html [Accessed: 8th August 2018].

919 Margolin, Uri, 1987, p. 110.

920 Seraphine, Frederic 2016.

921 Lindsay, Grace 'Critical Games: Critical Design in Independent Games'. *Proceedings of DiGRA 2014*, 2014 [Online]. Available at: https://www.researchgate.net/publication/267153275_Critical_Games_Critical_Design_in_Independent_Games [Accessed 8th August 2018], p. 5.

922 Harpold, Terry 'Screw The Grue: Mediality, Metalepsis, Recapture'. *Game Studies* 7 (1), 2007 [Online]. Available at: http://gamestudies.org/0701/articles/harpold [Accessed 8th August 2018].

923 Kroos, Christian 'The Art in the Machine'. *In:* Herath, Damien *et al.,* 2016 pp. 19 – 25, p. 25.

characterisation is Jimmy Andrews' and Loren Schmidt's *Realistic Kissing Simulator*[924], an artwork which stands as a critique of the lacklustre treatment of sexual politics in videogames by the use of unsubtle physical manipulations to lampoon a complex and intimate emotional act. For some, these works are an important avant-garde[925]: for others, they are a 'reactionary'[926] 'reinforcing [of] the... monoculture'[927] which ultimately 'devolves into conceptualism'[928] rather than tackling problems of characterisation directly[929].

Others have attempted to tackle the formal challenges, risks and expenses of computational representation in a different manner: pursuing resonance of character by devaluing, or discarding, the necessity of computation. Such works focus on the insights of audience response theory[930][931] which champion artworks as 'imaginative acts'[932], 'manifest through experiential effects'[933], producing works of comp-art and characterisations which do not centre on systemics, but rather the 'surface signs'[934] of the mediated, 'embedded'[935] mimetic, and are 'experienced more than[they are] encoded'[936]. Such works are more static than procedural, having more in common with 'radio plays'[937] or novels[938], the computation (as in traditional works) offloaded onto the autocosmic platforms of their audience's embodied minds, and their faculties of 'projection'[939], experiential modelling[940], 'illusion'[941], 'interpretative affordances'[942] and

924 Andrews Jimmy and Schmidt, Loren *Realistic Kissing Simulator* [Online]. Available at: http://jimmylands.com/experiments/kissing/ [Accessed 8th August 2018].
925 Schrank, Brian *Avant-Garde Videogames: Playing with Technoculture*. Massachusetts: The MIT Press, 2014.
926 Galloway, Alexander, 2006, p.125.
927 McMaster, Michael *Against Introspection: A speculative manifesto*, 2017 [Online]. Available at: http://michaeljmcmaster.com/writing/Against%20Introspection%20-%20Michael%20McMaster.pdf [Accessed 8th August 2018].
928 Bogost, Ian, 2017.
929 Holloway-Attaway, Lissa 'Artgames: Playing with Material Boundaries and Staking Claims'
930 Sanders, April, 2013.
931 Sanders, April, 2017.
932 Martin, Gareth Damian *No Man's Sky Is A Theater of* Processes, 2016 [Online]. Available at: https://killscreen.com/articles/no-mans-sky-theater-processes/ [Accessed 8th August 2018].
933 Salen, Katie and Zimmerman, Eric, 2004, p. 323.
934 Aarseth, Espen, 1997, p.29.
935 Wei, Huaxin 'Embedded narrative in game design'. *Proceedings of the International Academic Conference on the Future of Game Design and Technology,* 2010, pp. 247-250.
936
937 Pratt, Charles *In:* Klepek, Patrick 'Videogames Don't Have A Choice But To Tell Stories', 2017 [Online]. Available at: https://waypoint.vice.com/en_us/article/8qpdmv/video-games-dont-have-a-choice-but-to-tell-stories [Accessed 8th August 2018].
938 Alexander, 2014
939 Mateas, Michael 'Expressive AI: Games and Artificial Intelligence'. *Proceedings of Level Up: Digital Games Research Conference.* DGRC: Utrecht, 2003.
940 Salen, Katie and Zimmerman, Eric, 2004, p. 323.
941 Laurel, Brenda, 1993, p. 35.
942 Mateas, Michael, 2001, p.

other psychological/physiological abilities[943][944]. To such artists, these tools are far more powerful than the material technologies provoking them[945].

Examples of such approaches include the trope of the cutscene[946] in videogames; the use of fixed narrative elements to contextualise emergent, abstract gameplay, as in Mike Bithell's *Thomas Was Alone[947];* the use of depopulated environments and objects to explore and embody personhood through 'environmental storytelling'[948][949][950]; the 'illusion of intelligence'[951][952] in videogames and robotic art such as that of Edward Ihnatowicz[953] and Simon Penny[954]; the use of 'negative agency'[955], 'expressive acts'[956], the 'reflective choice'[957], the 'illusion of agency'[958] or choice[959][960] and other 'apparent'[961] emergences which serve to give audiences a sense of computational resonance without practically encoding it. Such an approach questions whether resonant characters in comp-art need to be computational at all: however, as Ryan pointed out nearly two decades ago[962], if such reliance on mimetic rather than systemic engagement is not managed well, relying instead on 'clever but shallow trickery'[963] or 'swindles'[964], it can merely throw into sharper relief the deficiency of the computation beneath.

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943 Madigan, James, 2016.
944 Hodent, Celia 'The Gamer's Brain: The UX of Engagement and Immersion (or Retention)', 2017 [Online]. Available at: https://www.gdcvault.com/play/1024482/The-Gamer-s-Brain-Part [Accessed 8th August 2018].
945 Pinchbeck, Daniel 'Trigens Can't Swim: Intelligence and Intentionality in First Person Game Worlds' *In: Conference Proceedings of the Philosophy Of Computer Games 2008.* Potsdam: Potsdam University Press, 2008.
946 Klevjer, Run 'Cut Scenes'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, p. 106.
947 Bithell, Mike, 2012.
948 Calleja, Gordon, 2011, p.119.
949 Jenkins, Henry, 2006.
950 Machidon, Octavian *et al.*, 2016, p. 249.
951 Reidl, Mark 'Interactive Narrative: A Novel Application of Artificial Intelligence for Computer Games'. *Proceedings of the Twenty-Sixth AAAI Conference on Artificial Intelligence*: AAAI, 2012, pp. 2160 – 2166 , p. 2160.
952 Riedl
953 Glynn, Ruairi 'Edward Ihnatowicz – The Senster', 2008 [Online]. Available at: http://www.interactivearchitecture.org/edward-ihnatowicz-the-senster.html [Accessed 8th August 2018].
954 Penny, Simon *Petit Mal*, 2006 [Online]. Available at: http://simonpenny.net/works/petitmal.html [Accessed 8th August 2018].
955 Kabo Ashwell, Sam, 2014.
956 Galloway, Alexander, 2004, p.
957 Anthropy, Anna and Clark, Naomi, 2011, p. 177.
958 Fendt, Matthew William *et al.* 'Achieving The Illusion Of Agency'. *In:* Oyarzun, David *et al.* (*eds.*) *Proceedings of the International Conference on Interactive Digital Storytelling*. ICIDS: Spain, 2012, pp. 114 – 125.
959 Froschauer, Adrian *Clementine will remember all of that: The Illusion of Choice in Telltale Games' The Walking Dead*, 2014 [Online]. Available at: http://ontologicalgeek.com/clementine-will-remember-all-of-that/ [Accessed 8th August 2018].
960 Koenitz 'the possibility of IDN stagecraft'
961 Tronstad, Ragnhild, 2014, p. 181.
962 Ryan, Marie-Laure, 2001.
963 Bringsjord, Selmer, 2001.
964 Ashwell, Sam Kabo, 2014.

Section 2.3 - Possible Autocosmic Solutions To The Challenges Of Computational Character

Anne's particular, 'moderne' model of the universe seeks total transformation of the complex subjectivities and opaque mysteries of everyday life into a 'bounded orderly cosmos'[965]; not through the complications of emotion, drama, bodily self and ineffable social contracts that have defined relations between 'cunning women' and their familiar spirits for centuries[966], but instead through mechanistic manipulation of a new sort of being – a person, as Anne sees it, with neither emotion, nor volition, nor any desire other than to 'Work'.

Within such a cool, deterministic manifesto, however – and through experience of `knole` as a whole – its obscured and tragic ingredients become apparent. Anne's desire for a mechanistic world, her relationship with and treatment of the 'Beest' in her home, her burgeoning theorems and confidences and proclamations of 'Troth', arise from a

965 Vella, Daniel, 2015.

966 Rose-Millar, Charlotte 'Over-familiar spirits: seventeenth century English witches and their devils'. *In:* Kounine, Laura and Ostling, Michael (*eds.*) *Emotions in the History of Witchcraft*. London: Palgrace Macmillan, 2016, pp. 173 – 189.

complex and flawed psychic landscape, defined by past sorrows, repressions, pains and unpredictabilities. This landscape provides the furniture of her worldview; the components of her supposedly-objective, rational rituals and experiments, her sense of self and self-history. Even to the very end, unexpectedly pregnant; her prophylactic rituals failed; the internal consistency of her beliefs shattered; her adoptive parents dead; her husband departed, and the 'County' turned against her: Anne persists in her misplaced, autocosmic narratives. Rather than a revelation of her mistakes, her circumstances become a vindication of her 'Troth', despite all evidence to the contrary. The *Housekeeping*, and the creature, become a gift to a young woman from the city below the moor who has appeared to Anne in a dream, full of self-evident significance; and who, she is convinced, will be honoured to continue her important 'Industry'. Even in such self-wrought difficulties, the gulf between her internal 'cosmos' and the external never becomes consciously apparent.

Such tensions parallel those in our own, 'moderne' times between real and virtual, particularly in relation to personhood; inherent between the 'incalculability of life'[967] and the 'simplification… [of] real-world ideas'[968]. The ability to meaningfully represent something of the 'Troth' of personhood – of its functionality, of its systemic complexity – through computational implementation is still dominated by manniquinery and static figment; which, despite my critical tone in the previous section, are part of a continuing and productive effort to mitigate and approach these challenges.

The potential midpoint of such practises, a character that is *both* computational and resonant, forms the heart of many design philosophies and academic theses (such as Michael Mateas' still-relevant 'Expressive AI'[969]). It remains a murky shibboleth, and illusory poster child, for commercial producers, independent artists and critical theorists alike[970][971]. It lies somewhere in the balance between Oatley's two forms of computation[972]; between comp-art's universal and 'particular' tenets;

967 Murray, Janet, 1997, p. 297.
968 Gard, Toby *Building Character,* 2000 [Online]. Available at: https://www.scribd.com/document/321423675/Toby-Gard-2000-Building-Character [Accessed 8th August 2018].
969 Mateas, Michael, 2001.
970 Anthropy, Anna and Clark, Naomi, 2014, p.
971 Zimmerman, Eric, 2014.
972 Oatley, Keith, 2008.

between the 'surface signs'[973] of mimesis and the 'modelling [of] systems'[974] as complementary 'sources of meaning'[975] and 'means of expression'[976]. Determining the proper balance or 'blend of human and computer meanings'[977] - between 'animism, artistry and AI'[978] 'computer logic and human logic'[979], 'interpretative' and 'authorial affordance[s]', 'meaning making and machine structure'[980] – remains both a 'common fantasy' and a 'common nightmare' within comp-art[981]. Whether commercial or artistic, common or 'radical'[982], such approaches all stand as attempts to reconcile these 'deliciously difficult'[983] and 'worthy problem[s]... in desperate need of further examination'[984].

As an artist 'design[ing] and implement[ing]... concrete artifacts'[985], developing a 'critical technical practice'[986], and as an academic pursuing practice-based research[987][988][989], such attempts at balance have helped to ground the complicated and iterative process of prototype, compromise, deliberate objective and original theses which comprise the development of my methodology.

These have included:

1) **Technological approaches to computational characterisation**.

knole's development included numerous investigations into the landscape of technologies (whether hardware or software) that could be applied to characterisation. Fully 75% of my study group saw technical

973 Aarseth, Espen, 1997, p. 29.
974 Bogost, Ian, 2017
975 Vella, Daniel, 2015.
976 Wardrip-Fruin, Noah, 2009, p. 295.
977 Norman, Donald, 2007.
978 Frude and Jandric, 2015
979 Dix, Alan *et al.*, 2004,
980 Mateas, Michael, 2001, p. 151.
981 Short, Tanya X. *Writing Modular Characters for System-Driven Games*, 2018 [Online]. Available at: https://www.gdcvault.com/play/1025017/Writing-Modular-Characters-for-System [Accessed 8th August 2018].
982 Galloway, Alexander, 2006, p.125.
983 Zimmerman, Eric
984 Bailey, Christine *et al.* 'Believability Through Psychosocial Behaviour: Creating Bots That Are More Engaging and Entertaining'. *In:* Hingston, Peter (*eds.*) *Believabile Bots*. Berlin: Springer, 2012, pp. 29 – 70, p. 29.
985 Koenitz
986 Mateas, Michael, 2002, p. ii.
987 Candy, Linda and Edmonds, Ernest 'Practice-Based Research in the Creative Arts: Foundations and Futures from the Front Line'. *Leonardo* 51(1), 2018, pp. 63-69.
988 Koenitz, Hartmut 'Interactive Storytelling Paradigms and Representations: A Humanities-Based Perspective'. *Handbook of Digital Games and Entertainment Technologies,* 2016, pp. 1 – 15.
989 Benford "artist-led research' reconciles practice, research and studies through critical reflection, iterative design,'

improvements as being the most important factor in improving computational characters, including machine learning and neural network techniques[990991992993], natural language processing[994995], affective and biofeedback techniques[996997998], innovative input and output devices[9991000], new software tools for AI[1001], and academic models of artificial intelligence that are beginning to make in-roads into consumer and artistic spheres[10021003].

The final iteration of the `masterbeast` is based on several overlain considerations of these technologies and others; their ease of implementation; their ability to usefully bridge the formal gulf between actual and aesthetic functionality of personhood; and whether the implementation of such technologies in the utopianism of 'techno-determinist' cultures[1004100510061007] are actually evidence of 'technical progress outstrip[ping] aesthetic progress'[1008], damaging the 'visionary impulse'[1009] that must guide narrative art, and standing as evidence of an immature practice seeking 'scientific curiosity [rather than] creative enterprise'[10101011].

990 Penny, Simon, 2016, p.55.
991 Russell, Stuart and Norvig, Peter, 2009, p.
992 Tence, Fabien *et al.*, 2010.
993 Harris, Terry and Gittens, Curtis 'Modeling believable agents using a descriptive approach'. *Biologically Inspired Cognitive Architectures* 14 (1), 2015, pp.10 -21.
994 Mateas, Michael and Stern, Andrew, 2003.
995 Ma, Minhua *et al.* 'Question-Answering Virtual Humans Based on Pre-recorded Testimonies for Holocaust Education'. *In:* Ma, Minhua *et al.* (*eds.*) *Serious Games and Edutainment Applications*. London: Springer, 2011, pp.
996 Christy and Kucheva 2014
997 Dix, Alan *et al.*, 2004, p.
998 Champion, Erik and Dekker, Andrew 'Biofeedback and Virtual Environments'. *International Journal of Architectural Computing* 9 (4), 2011, pp. 377 – 396.
999 Murata, Tomoya and Shin, Jungpil 'Hand Gesture and Character Recognition Based on Kinect Sensor'. *International Journal of Distributed Sensor Networks* 2014
1000 *Magic Leap*, 2018 [Online]. Available at: https://www.magicleap.com/ [Accessed 8th August 2018].
1001 *SpiritAI*, 2018 [Online]. Available at: https://spiritai.com/ [Accessed 8th August 2018].
1002 Yannakakis, Georgios and Togelius, Julian 'A Panorama of Artificial and Computational Intelligence In Games'. *IEEE Transactions on Computational Intelligence and AI in Games* 7 (4), 2015, pp. 317 – 335.
1003 Togelius, Julian *Why academics and game industry don't collaborate on AI, and how we could improve the situation,* 2014 [Online]. Available at: http://togelius.blogspot.co.uk/2014/10/why-academics-and-game-industry-dont.html [Accessed: 8th August 2018].
1004 Keogh, Brendan *2016-08-17*, 2016 [Online]. Available at: http://ungaming.tumblr.com/post/149102772520/i-tweeted-a-link-to-this-article-on-the-bus-about [Accessed 8th August 2018]
1005 Anthropy, Anna and Clark, Naomi, 2011, p.
1006 Hancock, Michael *Games with Words: Textual Representation in the Wake of Graphical Realism in Videogames*. [PhD Thesis]. Canada: University of Waterloo, 2016.
1007 Rahaman, Hafizur and Kiang, Tan Beng, 2017.
1008 Bogost, Ian, *The Portrait of the Artist as a Game Studio,* 2012, [Online]. Available at: https://www.theatlantic.com/technology/archive/2012/03/a-portrait-of-the-artist-as-a-game-studio/254494/ [Accessed: 8th August 2018].
1009 Laurel, Brenda, 1993,
1010 Mullaney, 2013
1011 Machidon, Octavaian *et al.*, 2016.

Through such study and critical thinking, I came to use a palette of tools and technologies which provided a proper mix of resonant experimentation, theoretical grounding, artistic expressivity and suitability to my capabilities as a programmer. `knole` does not use any revolutionary technologies or softwares: it was built and runs with the now-venerable Gamemaker Studio 1.4 IDE[1012], mostly used for simple 2D platformer games, and its suitability in competition with other platforms is often debated[1013][1014][1015][1016]; there are certainly few (if any) developers using it to build an AI-driven installation piece. My reasons for using this software were eminently practical: it had been my introduction to object-oriented programming, and learning a more advanced tool like Unity[1017], or implementing an advanced AI suite as part of my development, would have diverted my efforts from creative to technical progress for much of my PhD, with little bearing on my evolving theories. While it may not (in retrospect) have been the most appropriate tool for developing a computational character from scratch, it became an opportunity to learn from, iterate and implement my theoretical work without the more restrictive, pre-emptive affordances of other, more 'appropriate' software.

Despite the `masterbeast` being implemented little differently from the simple 'model-based reflex agents'[1018] that have dominated academic and artistic approaches to computational character for decades[1019], my use of this simple toolset allowed me to implement and experiment with numerous existing architectures, both from academia and industry, and build my own approach upon them. Thus the `masterbeast` is heavily based on Joanna Bryson's Behaviour-Oriented Design

1012 YoYo Games *Gamemaker*, 2018 [Online]. Available at: https://www.yoyogames.com/gamemaker [Accessed 8th August, 2018].
1013 TeeGee *Professional developer's look at GameMaker,* 2012 [Online]. Available at: http://moacube.com/blog/professional-developers-look-at-gamemaker/ [Accessed 8th August 2018].
1014 Nox *GameMaker is an Abomination*, 2014 [Online]. Available at: http://purplepwny.com/blog/gamemaker_is_an_abomination.html [Accessed 8th August 2018].
1015 Lastninja2 *Unity vs. Game Maker for 2D games discussion*, 2016 [Online]. Available at: https://www.reddit.com/r/gamedev/comments/5eaxgv/unity_vs_game_maker_for_2d_games_discussion/ [Accessed 8th August 2018].
1016Batchelor, James *YoYo Games: "Our competition with Unity is all in people's heads"*, 2017 [Online. Available at: https://www.gamesindustry.biz/articles/2017-03-08-yoyo-games-our-competition-with-unity-is-all-in-peoples-heads [Accessed 8th August 2018].
1017 Unity Technologies *Unity*, 2019 [Online]. Available at: https://unity3d.com/ [Accessed 8th August 2018].
1018 Russell, Stuart and Norvig, Peter, 2009, p.
1019 Millington, Ian and Funge, John, 2009, p.

framework[1020][1021], a 12-year-old AI architecture, deriving on much older models of AI[1022][1023] which combines systemic implementation and audience engagement and is already very popular in games development[1024]. I modified Bryson's original specification slightly by incorporating elements from other work, both new and old, on emotion[1025][1026][1027][1028][1029][1030][1031], attention[1032], utterance[1033][1034], personality[1035][1036][1037][1038][1039] and other elements of agent-based systemics[1040]. I also experimented with several other relatively-unusual technologies, including high-definition webcams, touchscreens and microphones linked to cloud-based machine learning APIs to facilitate voice, sound, touch, face movement and emotion recognition as part of a 'mixed-reality' methodology (see below).

2) **Lack of sophisticated visual representation.**

1020 Bryson, Joanna J. 'The Behavior-Oriented Design of Modular Agent Intelligence'. *In:* Kowalszyk, R. e*t al.* (*eds.*) *Agent Technologies, Infrastructures, Tools, and Applications for e-Services.* London: Springer, 2003, pp. 61–76.
1021 Partington, Samuel and Bryson, Joanna 'The Behavior Oriented Design of an Unreal Tournament Character'. In: Panayiotopoulos, T. *Et al.* (*eds.*) *The Fifth International Working Conference on Intelligent Virtual Agents*. 2005, pp. 466- 477.
1022 Brooks, Rodney 'Intelligence Without Representation'. *Artificial Intelligence* 47 (1-3), 1991, pp. 139 – 159.
1023 Connell, Jonathan 'A Colony Architecture for an Artificial Creature' [Technical Report]. Boston: MIT, 1989.
1024 Armstrong, Andrew *The Behavior-Oriented Design of Modular Agent Intelligence*, 2009 [Online]. Available at: https://aigamedev.com/open/reviews/behavior-oriented-design-modular-agent/ [Accessed 8th August 2018].
1025 Goncalves, Carlos Pedro 'Emotional Responses in Artificial Agent-Based Systems: Reflexivity and Adaptation in Artificial Life' [PhD Dissertation]: Instituto Superior de Ciências Sociais e Políticas, 2014.
1026 Ruttkay, Zsofia 'Constraint-Based Facial Animation'. *Constraints* 6 (1), 2001, pp.85 – 113.
1027 Bryson, Joanna J. and Tanguy, Emmanuel 'Simplifying the Design of Human-Like Behaviour: Emotions as Durative Dynamic State for Action Selection'. *International Journal of Synthetic Emotions* 1 (1), 2010, pp. 1 – 21.
1028 Novikova, Jekaterina *et al.* 'The role of emotions in inter-action selection'. *Interaction Studies* 15 (2), 2014.
1029 Novikova, Jekaterina and Watts, Leon 'A Design Model of Emotional Body Expressions in Non-humanoid Robots'. *Proceedings of HAI 2014.* Japan: HAI, 2014.
1030 Dragoni, Aldo Franco 'A MODEL FOR BELIEF REVISION IN A MULTI-AGENT ENVIRONMENT'. *ACM SIGOIS Bulletin* 13 (3), 1992, p. 9.
1031 See Appendix #9, Figure 17a – 17e.
1032 Yu, Yuanlong *et al.* 'An Object-Based Visual Attention Model for Robotic Applications'. *IEEE Transactions On Systems, Man and Cybernetics* 40 (5), 2010, pp. 1398 – 1412.
1033 Read, Robin and Belpaeme, Tony 'People Interpret Robotic Non-linguistic Utterances Categorically'. *International Journal of Social Robotics* 8 (1), 2016, pp. 31 – 50.
1034 See Appendix #9, Figure 12.
1035 Pan, Xueni *et al.* 'Expressing Complex Mental States Through Facial Expressions'. *Proceedings of the ACII 2007.* Berlin: ACII, 2007, pp. 745 – 746.
1036 Evans, Richard 'Representing Personality Traits as Conditionals'. *Proc. Artif. Intell. Simul. Behav.*, 2008, pp. 64-82.
1037 Barriga, Silviano Diaz *et al.* 'Emotional Attention in Autonomous Agents: a Biologically Inspired Model'. *Proceedings of the 2012 International Conference on Cyberworlds.* Darmstadt, 2012.
1038 Bryson, Joanna and McGonigle, Brendan 'Agent architecture as object oriented design'. *In:* Singh, Munindar *et al.* (*eds.*) *Intelligent Agents IV: Agent Theories, Architectures, and Languages.* London: Springer, 1997
1039 Radoslaw, Niewiadomski *et al.* 'Modelling multimodal expression of emotion in a virtual agent' *Philosophical transactions of the Royal Society of London. Series B, Biological sciences 364*(1535), 2009, pp.3539-3548.
1040 See Appendix #9, Figure 19.

`knole` is not a demonstration of the 'increasingly visceral representational technologies'[1041], whether in pursuit of graphical realism[1042][1043] or stylised visual aesthetics[1044], that continue to define computational character, particularly in videogames, even outside of the 'AAA production space'[1045]. The visual design of the `masterbeast` does have some relevance to its resonance – a layered and textured 2D effect that is designed to reproduce the effect of paper[1046], as a commentary on how contemporary media doubted the veracity of Anne's 'spyrit' and its practices. It was also a matter of pragmatic concern for development time, and my own artistic ability. However, it also serves as a stance on the ever-increasing criticism within comp-art on the 'uncritical uptake'[1047] of representational fidelity. Such fidelities are often seen as at the expense of the wider variety of experiences and representations important to comp-art, particularly that of the systemic[1048][1049][1050][1051], and are said to damage those resonances through over-ambition or unfavourable comparison[1052][1053][1054][1055][1056][1057]. `knole`, while still a mimetically-arresting experience, tries to focus its audience's attention on its systemic resonances, and demonstrate their importance over any supposed visual realism.

3) **Smaller or more considered scales and 'focalisations'[1058] of experience.**

1041 Murray, Janet, 1997, p. 28.
1042 Grau, Oliver, 2003.
1043 Bogost, Ian, 2015.
1044 Thibault, Mattia *Post-digital games: The Influence of Nostalgia in Indie Games' Graphic Regimes'. Gamevironments* 1 (4), 2016, pp. 1 – 24.
1045 McMaster, Michael *On Formalism*, 2014 [Online]. Available at: https://medium.com/@michaeljmcmaster/on-formalism-a1b4e95bb435 [Accessed 8th August 2018].
1046 See Appendix #9, Figure 20.
1047 Keogh, Brendan, 2014.
1048 Klevjer, Rune 'Graphical Realism'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp. 241 – 245.
1049 Thon, Jan-Noel, 2014.
1050 Calleja, Gordon, 2011, p. 119.
1051 Salen, Katie and Zimmerman, Eric, 2004, p.
1052 Mori, Masahiro *et al.* 'The Uncanny Valley [From the Field]' *IEEE Robotics & Automation Magazine* 19 (2), 2012, pp. 98 – 100.
1053 Lay, Stephanie *et al.* 'Circling Around the Uncanny Valley: Design Principle for Research Into the Relation Between Human Likeness and Eeriness'. *I-Perception* 7 (6), 2016, pp. 1 – 11.
1054 Schneider, Edward *et al. Exploring the Uncanny Valley with Japanese Video Game Characters.* Proceedings of the DiGRA 2007 Conference. DiGRA, 2007.
1055 Ryan, Marie-Laure, 2001.
1056 Hancock, Michael, 2016.
1057 Youngblood, G. Michael *et al.* 'Embedding Information into Game Worlds to Improve Interactive Intelligence'. *In:* Gonzalez-Calero, Pedro Antonio and Gomez-Martin, Marco Antonio *(eds.),* 2011, p. 31 – 53.
1058 Genette, Gérard, 1972.

`knole` takes as its computational focus a single character, in face-to-face confrontation with the audience, drawing on trends of 'vignette'[1059][1060] works which seek to 'ratchet the scenario down'[1061] from vast, open-world affairs with much breadth but little depth[1062][1063] to focus artistic efforts on the meaningful and deeper portrayal of interactions between small groups of characters or with individual characters[1064]. Illustrative examples of this include the previously-mentioned *Facade*[1065], Jeroen Stout's upcoming 'interactive theater' work *Cheongsam*[1066], and Emily Short's *Galatea*[1067].

4) **The 'mixed reality'[1068] dynamic.**

As has already been established, the use of 'mixed reality' in `knole` exists primarily to explore questions raised by Anne's fiction through 'mechanical metaphor'[1069]: questions of virtuality and reality, Anne's personal obsession with idealised, mechanical rationality, the organic chaos of the real world and the permeability of the authorised interfaces (and unauthorised contaminations) between the two[1070].

However, on a more pragmatic level, I was interested to experiment with using 'mixed reality' techniques and the 'post-PC... bodily turn'[1071] – in particular, unusual input devices, physical props and the

1059 Boudreault, Simon-Albert 'Small Games, Big Feels: Storytelling with Vignettes' *Game Developer Conference 2017*, 2017 [Online]. Available at: https://www.gdcvault.com/play/1024430/Small-Games-Big-Feels-Storytelling [Accessed 8th August 2018].
1060 Koentiz, Hartmut, 2015, p. 54.
1061 Short, Emily *Making NPC Interaction More Meaningful | Dark Pixel Podcast: Ep. 101 (Ft. Emily Short)*, 2018 [Online]. Available at: https://www.youtube.com/watch?v=508QS_5oPUs [Accessed 8th August 2018].
1062 Koster, Raph 2018.
1063 Youngblood, G. Michael *et al.*, 2011, p. 31.
1064 Machidon quote on virtual humans
1065 Mateas, Michael and Stern, Andrew, 2005.
1066 Stout, Jeroen *Cheongsam*, 2018 [Online]. Available at: http://stoutgames.com/:cheongsam [Accessed 8th August 2018].
1067 Short, Emily *Galatea* [PC Software], 2000, [Online]. Available at: https://ifdb.tads.org/viewgame?id=urxrv27t7qtu52lb [Accessed 8th August 2018].
1068 Benford, Steve and Giannachi, Gabriella, 2011.
1069 Locke, Vince 'The Power of Ludonarrativity: *Halo* as Participatory Myth'. *In:* Kapell, Matthew Wilhelm (*eds.*) *The Play Versus Story Divide in Game Studies: Critical Essays.* North Carolina: McFarland and Company, 2016, pp. 86 – 100, p. 87.
1070 Kolva, Boriana *et al.* 'Traversable Interfaces Between Real and Virtual Worlds' *Proceedings of the Computer-Human Interaction Conference 2000*. ACM, 2000.
1071 Knoller, Noam and Ben-Arie, Udi 'The Holodeck is all Around Us – Interface Dispositifs in Interactive Digital Storytelling' *In:* Koenitz, Harmut *et al.* (*eds.*), 2015, pp. 51 – 66, p. 51.

'mix[ing of] real and virtual worlds in rich and complex ways'[1072107310741075 1076] to produce certain 'journeys' or 'trajectories.. interwoven'[1077] through an experience - as an experiment with resonance itself. Mixed reality has already been extensively employed in virtual heritage intepretation[1078107910801081 1082] precisely because of the particular affordances of that form (situated, exhibitionary, interactive, physical) and its continued concern with creating resonant experiences for visitors around both tangible and intangible heritage; turning institutional 'physical spaces into experiential spaces'[1083]. This is paralleled by an increasing interest in game studies with 'the phenomenological pleasures of videogame play across worlds and bodies', most evinced by the post-phenomenological scholar Brendan Keogh[1084], who attempts to reconsider videogame experiences as a 'hybridity of worlds and the tensions between them'[1085] - real and virtual – experienced bodily.

Not only is the body – its analogue complications, and its interactions with the idealised 'virtual' - central to Anne's philosophy, and thus her interactions with her spirit, but my methodology is interested in finding innovative ways to have computational characters resonate with their audiences. A mixed reality approach allows the 'spyrit', Anne and the rest of the inhabitants of my 'storyworld'[1086] to communicate with and resonate with a wide variety of the audience's narratising faculties – not only textually and virtually, but bodily, haptically and performatively[1087 1088 1089]. It uses these natural faculties of enactment, 'body

1072 Benford, Steve and Giannachi, Gabriella 'Interaction As Performance'. *IXI* 19 (3), 2012, pp. 38 - 43
1073 Dieck, M.C. and Yung, T.H. 'Value of Augmented Reality at Cultural Heritage Sites: A Stakeholder Approach'. *Journal of Destination Marketing and Management* 6 (2), 2017, pp.110 – 117.
1074 Green, Jonathan *et al.* 'Camping in the digital wilderness: tents and flashlights as interfaces to virtual worlds'. *CHI'02 Extended Abstracts on Human Factors in Computing Systems*. ACM, 2002.
1075 Hall, Tony *et al.* 'The Visitor as Virtual Archaeologist: Explorations in Mixed Reality Technology to Enhance Educational and Social Interaction in the Museum'. *In: Proceedings of the 2001 conference on Virtual reality, archeology, and cultural heritage*. ACM, 2001, pp. 91-96.
1076 Benford, Steve *et al.* 'Unearthing Virtual History: Using Diverse Interfaces to Reveal Hidden Virtual Worlds'. *In:* Abowd, Gregory *et al.* (*eds.*) *UbiComp 2001: Ubiquitous Computing*. Georgia: Springer, 2001, pp. 225 – 231.
1077 Benford, Steve and Giannachi, Gabriella, 2011, p.
1078 Kenderdine, Sarah, 2016.
1079 Bekele, Mafkereseb *et al.* 'A Survey of Augmented, Virtual, and Mixed Reality for Cultural Heritage'. *Journal on Computing and Cultural Heritage 11 (2),* 2018, pp. 1 – 36.
1080 Ioannides, Marinos *et al.*, 2017.
1081 Bostanci, Erkan *et al.* 'Augmented reality applications for cultural heritage using Kinect'. *Human-centric Computing and Information Sciences* 5 (20), 2015, pp. 1 – 18.
1082 Papaefthymiou, Margarita *et al.*, 2017.
1083 cite
1084 Keogh, Brendan *A Play of Bodies: How We Percieve Videogames.* Massachusetts: The MIT Press, 2018.
1085 Keogh again
1086 Ryan, Marie-Laure, 2013.
1087 Spence, Jocelyn *Performative Experience Design*. London: Springer, 2016, p.1.
1088 Laurel, Brenda, 1993.
1089 Tronstad, Ragnhild 'Performance'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp.388 – 393.

centred interaction'[1090], sensory stimulation, proxemics, posture, embodied environmental factors, 'physical bodies and how they are represented'[1091] - in short, active presence, the 'user's sense of *being there*'[1092] - for aesthetic purposes; to provide new resonant pathways, sources of Fischer-Lichter's 'heightened attention'[1093], and communications of the significance of `knole` in order to experiment with "intersubjective, aesthetic, and potentially transformational"[1094] approaches to character.

Such an approach is evident across the `knole` installation, particularly in the focus on a 'greater 'naturalness in the interface encounter'[1095] through an 'ecology of interfaces'[1096]: in the need for the visitor to physically kneel before the 'spyrit'[1097]; the choice of Corsham Court for the main installation, both for its darkness and low temperatures; the provision of a cloak impregnated with the scent of thyme, tying it inextricably to textual references to the character who owned it; the use of the crack assemblage as a mediating, delimiting and physical interface with the touchscreen, requiring deliberate, intimate physical action. It is also evident in the more common usages of what Keogh calls 'muscles-against interfaces'[1098] - the use of 'natural interfaces'[1099] such as voice, touch, gesture, facial expressions, and physical props. Each have their own texture to lend to the experience of `knole`'s storyworld, but also all, in some way, facilitate and enliven the narrative relationship between visitor and `masterbeast`. In all its 'corporeal, technological and virtual component[s]'[1100], the work seeks avenues for using the embodied, autocosmic faculties of my audience; facilitating identification, transportation, 'social involvement'[1101], immediacy, intimacy and metaleptical, thematic consideration. This is explored in greater detail in Chapter 3 of this thesis.

1090 Slater, Mel and Usoh, Martin 'Body Centred Interaction in Immersive Virtual Environments'. *Artificial life and virtual reality* 1 (1), 1994, pp. 125-148.
1091 quote
1092 Gilkey, Robert H. 'Creating Auditory Presence'. *In:* Smith, Michael J. *et al.* (*eds.) Usability Evaluation and Interface Design: Cognitive Engineering, Intelligent Agents and Virtual Reality*. New Jersey: Lawrence Erlbaum, 2001, pp. 609 – 613, p. 609.
1093 Fischer-Lichte, Erika. *The Transformative Power of Performance: A New Aesthetics*. London: Routledge, 2008.
1094 Spence, Jocelyn *et al.* 'Performative Experience Design' *Digital Creativity* 24 (2), 2013, pp.
1095 Newman, James, 2002, p. 416.
1096 Benford, Steve and Giannachi, Gabriella, 2011, p. 163.
1097 See Appendix #9, Figures 8a - 8c.
1098 Keogh, Brendan, 2018 [Online]. Available at: https://mitpress.mit.edu/books/play-bodies [Accessed: 8th August 2018].
1099 Alisi, Thomas *et al.* 'Natural Interfaces To Enhance Visitor's Experiences'. *IEEE Multimedia* 12 (3), 2005, pp. 80 – 85.
1100 Keogh, Brendan, 2018.
1101 Calleja, Gordon, 2011, p. 38.

5) **Systemic Approaches To Computational Design.**

knole is particularly indebted to the trend of 'systemic' design[1102] and 'cybernetic thinking'[1103] within narrative comp-art, particularly in videogames practice: a practice which draws on concepts from information theory, complexity theory and computer science more broadly[1104] to attempt the building of interesting procedural systems in works of comp-art, with varying levels of depth, emergence[1105] and autonomy[1106], to systemically represent meaningful functionalities of narrative worlds and their existents[1107]. Koenitz calls such works 'system narratives', and sites them within the broader context of computational 'system art': seeing them as central to the pursuit of meaningful interactive digital narrative[1108]. While the ludic structures of many videogames continue to be the most popular way of marrying systemic structures and narrative engagement, many works and authors attempt to look beyond this limited purview to other 'machinic structures'[1109].

Such approaches can be seen in the high school social simulator *Prom Week*[1110]*;* in Ian Cheng's simulation work[1111]; in the 'fantasy world simulator [and] storytelling engine'[1112] *Dwarf Fortress*; in Emily Short's continuing work on 'tighten[ing] the world-plot interface' through systemic design of conversations, dramatic scenarios and social relationships[1113]. Even in the consumer space, ambitious works such as *Alien: Isolation*[1114],

1102 Sellers, Mike *A Systemic Approach To Systemic Design*, 2015 [Online]. Available at: https://www.youtube.com/watch?v=HR8EmTyJz9A [Accessed 8th August 2018].
1103 Bown, Oliver *et al.* 'The Machine As Autonomous Performer'. *In:* Candy, Linda and Ferguson, Sam (*eds.*) 2014, p. 76.
1104 Goldstein, Jeffrey 'Emergence as a Construct: History and Issues' *Emergence* 1 (1), 1999, pp. 49 – 72.
1105 Louchart, Sandy *et al.*
1106 Mateas, Michael and Stern, Andrew, 2003.
1107 Koenitz, Hartmut *et al.* 'Introduction: Beyond the Holodeck: A Speculative Perspective on Future Practices'. *In:* Koenitz, Hartmut *et al.* (*eds.*), 2015, pp. 151 – 158, p. 154.
1108 Koenitz, Hartmut, 2016, p.52.
1109 Calleja, Gordon, 2011, p.
1110 UCSC *Prom Week*, 2012 [Online]. Available at: https://promweek.soe.ucsc.edu/play/ [Accessed 8th August 2018].
1111 Cheng, Ian, 2018.
1112 Adams, Tarn *In:* Fenlon, Wes *Dwarf Fortress creator Tarn Adams talks about simulating the most complex magic system ever*, 2017 [Online]. Available at: https://www.pcgamer.com/uk/dwarf-fortress-creator-tarn-adams-talks-about-simulating-the-most-complex-magic-system-ever/ [Accessed 8th August 2018].
1113 Short, Emily *Tightening the World-Plot Interface: or, Why I Am Obsessed With Conversation Models*, 2015 [Online]. Available at: https://www.gamasutra.com/blogs/EmilyShort/20150609/245530/Tightening_the_WorldPlot_Interface_or_Why_I_Am_Obsessed_With_Conversation_Models.php [Accessed 8th August 2018].
1114 Creative Assembly *Alien: Isolation* [PC Software]. UK: Sega, 2014.

Middle Earth: Shadows of War[1115] and *The Last Guardian*[1116] have been praised for their tight focus on strong character representation through complex, simulative systems, produced using authored, innovative application of 'tried and tested' approaches rather than technical wizardry[1117]. These works, and others, have served as important touchstones for `knole`, particularly those which take 'character-first', agency-led approaches to computational narrative. Like them, `knole` has sought, at its heart, to focus on the creation of narrative engagement with character through strong, complex, modular systems, governing the 'spyrit''s emotions, behaviours, personality and memory[1118], to produce emergent behaviours and reactions to audience interaction and other inputs: crafting a subtle, systemic representation of personhood with narrative significance in its own world.

* * * * *

These elements of `knole`'s engagement with the question of resonant computational characterisation are important: but perhaps the most important element of my methodology is philosophical, rather than technical or narrative. Like many before me in comp-art, I am concerned with the nature of the supposed goal at hand; what, in the context of comp-art, *is* narrative and character? Simply put, are we best served by pursuing the same sorts of personhoods we seek to build in books, or films, at a fundamental level? Many scholars consider how comp-art 'tap[s] the emotional residue of previous narrative experiences'[1119] as a template for its own efforts. From screenwriting[1120][1121] and Aristotelian dramatics[1122] to 'radio plays'[1123] and the 'love stories and intimate dramas'[1124] that have long been the aim of serious storytelling in comp-art, techniques of characterisation have frequently been (and continue to be) 'imported from other media'[1125] using models 'distilled from literary fiction, film and theater'[1126][1127]. In

1115 Monolith Productions *Middle Earth: Shadows of War* [PC Software]. US: Warner Bros. Interactive, 2017.
1116 SIE Japan Studio *The Last Guardian* [PS4 Software]. Japan: Sony Interactive Entertainment, 2016.
1117 Thompson, Tommy *The Perfect Organism | The AI of Alien: Isolation*, 2016 [Online]. Available at: https://www.youtube.com/watch?v=Nt1XmiDwxhY [Accessed 8th August 2018.
1118 See Appendix #9, Figure 19.
1119 Jenkins, Henry, 2006, p. 671.
1120 Koster, Raph *et al.*, 2018.
1121 Bogost, Ian, 2017.
1122 Laurel, Brenda, 1993.
1123 Pratt, Charles *In:* Klepek, Patrick, 2017.
1124 Spector, Warren, 2013
1125 Murray, Janet, 1999, p. 58.
1126 Lankoski, Petri and Bjork, Staffan, 2007.
1127 Loyall, A. Bryan, 1997.

pursuing resonant computational characterisation, they seek to provide, in essence, 'an enhanced version of literary classics'[1128], a 'holodeck'[1129] of simulated versions of existing models.

While it would be simplistic to state that such models of characterisation are entirely 'irrelevant'[1130], their influence avoidable[1131][1132],or the efforts of 'artists… working to understand [personhood] for millennia'[1133] of no use to the comp-artist, there is agreement that the 'particular' formal qualities of comp-art have been underconsidered when such traditional models are applied[1134][1135][1136][1137]; indeed, as Koenitz asserts, the nature of such models as 'the Aristotelian arc', which is often cited as a major foundation for comp-art narratives, even in self-consciously 'artistic' games, has been misunderstood entirely[1138]. This chapter began with a consideration of the universal similarities between all characters, and the 'particular'[1139] differences of those mediated computationally; and it appears that often computational characters have not attempted to balance these two considerations, but rather have mistaken the specific qualities of other narrative media for universal prescriptions. Ryan and Bogost both critique Murray's 'holodeck' as a 'myth' and a 'dream'[1140][1141] which has little chance of being realised using computational technologies: and others consider the adoption of 'classical notions of narrative'[1142] in comp-art to be a 'fraught practice'[1143], both 'useful and dangerous'[1144]. Such 'legacy theoretical frameworks'[1145] were not designed to respond to the 'alternative aesthetic principles'[1146] – the different resonances and 'systemic model[s]'[1147] – that

1128 Ryan, Marie-Laure, 2001.
1129 Murray, Janet, 1997.
1130 Calleja, Gordon, 2011, p.2.
1131 Tavinor, Grant, 2007, p.2.
1132 Keogh, Brendan, 2015.
1133 Loyall, A. Bryan, 1997, , p.169.
1134 Madej, Krystina '"Traditional Narrative Structure": not traditional so why the norm?'. *Proceedings of NILE 2008*, 2008.
1135 Koenitz, Harmut 'Beyond "Walking Simulators": Games as the Narrative Avant-Garde'. *Proceedings of the DiGRA Conference 2017*, 2017.
1136 Koenitz, Hartmut *et al.*, 2015, p.152.
1137 Aarseth, Espen. 'A Narrative Theory of Games' *Foundation of Digital Games 2015*, 2015, pp. 1–5.
1138 Koenitz, Hartmut *et al.*, 2018.
1139 Keogh, Brendan, 2015.
1140 Bogost, Ian, 2017.
1141 Ryan, Marie-Laure, 2001.
1142 Calleja, Gordon 'Experiential Narrative In Game Environments'. *Proceedings of the DiGRA 2009 Conference*. DiGRA, 2009, p. 1.
1143 Ciccoricco, David 'Games as Art/Literature'. *In:* Ryan, Marie-Laure *et al.* (*eds.*), 2014, pp. 220 - 224, p. 223.
1144 Wright, Will 'Introduction' *In:* Freeman, David *Creating Emotion In Games.* Berkeley: New Riders, 2004.
1145 Koenitz, Hartmut *et al.*, 2015, p. 96.
1146 Jenkins, Henry, 2006, p. 671.
1147 Short, Tanya X. *Writing Modular Characters for System-Driven Games*, 2018 [Online]. Available at: https://www.gdcvault.com/play/1025017/Writing-Modular-Characters-for-System [Accessed 8th August 2018].

arise from computational practice. Many of the struggles to produce resonant characters may derive directly from attempts to "interactivize' traditionally static structures instead of exploring dynamic models'[1148]; 'map[ping] traditional narrative structures'[1149] to decidedly different procedural structures in comp-art[1150].

The source of new models of 'more suitable... narrative modes and themes'[1151], working with comp-art's 'specific mode[s] of narrativity'[1152], is thus of primary importance to approach the question of resonance in computational character. For many, the answer lies in the consideration of 'post-classical'[1153] ideals of narrative, the changing conceptions of the aesthetic, the artful and the 'literary': in short, with an autocosmic conception of narrative engagement. Scholars and practitioners have written extensively on the need for comp-art's narrative models that cleave 'closer to life experience'[1154] and 'the individual's phenomenal relation to the world'[1155], precisely because of the computational's ability to represent functionality through 'procedural combinatorics'[1156] has more in common with our 'experiential'[1157], systemic, social, interactive, 'sensorimotor'[1158] engagement with worlds directly than other modes of mimesis[1159].

This interdisciplinary approach to the *method* of comp-art – bringing it closer to real life – stands separately from the *political* and *philosophical* imperative[1160], derived from the Modernist project[11611162], of moving beyond traditional aesthetic divides as an act of solidarity, protest or democratic provocation[1163] (though Koenitz does consider Brechtian practice as a model for computational narrative design[1164]). It is also not a

1148 Koenitz, Harmut, 2015, p. 3.
1149 Jenkins, Henry, 2006, p. 671.
1150 Koenitz, Hartmut *et al.*, 2015, p. 72.
1151 Ryan, Marie-Laure, 2001.
1152 Thon, Jan-Noel, 2014, p.
1153 Mani, Inderjeet, 2013.
1154 Ryan, Marie-Laure, 2014, p. 11.
1155 Vella, Daniel, 2015.
1156 Koenitz, Hartmut, 2015, p. 53.
1157 Calleja, Gordon, 2011, p. 119.
1158 Penny, Simon *What Is Artful Cognition?,* 2003 [Online]. Available at: https://pdfs.semanticscholar.org/2bc3/85604c2870c61c861966093cd4fdbc615fb0.pdf [Accessed 8th August 2018], p. 5.
1159 Szilas, Nicolas 'Reconsidering the Role of AI in Interactive Digital Narrative. *In:* Koenitz, Hartmut *et al.* (*eds.*), 2015, pp. 136 - 149, p. 145.
1160 Berleant
1161 Desmond Morris
1162 Hofstadter
1163 Flanagan, Mary, 2009.
1164 Koenitz, Harmut, 2015, p. 58.

repetition of strictly Formalist, primarily ludological positions[1165] that debate the importance of narrativity and 'worldness'[1166] to videogames and other comp-arts directly[1167]; indeed, former supposed proponents of this position, such as Frasca and Eskenlinen, have struggled to shake off their ludological albatrosses and to counsel a more integrative 'narrativist simulation' that privileges the 'complex interplay between these two modes of representation'[11681169].

When considering comp-art as 'experience, as distinct from artefact or object'[1170], scholars seek to transcend the novel, or the film, as the primary model of narrative characterisation, and instead seek out new models that more closely represent how our 'imaginative systems'[1171] engage with the material systems of the world through a 'system-modeling medium'[1172]; how our 'familiarity with embodied and perceptual experience can be used'[1173]; how non-Western narrative structures and characterisations, often straddling the non-aesthetic/aesthetic divide, might better suit computational storytelling than our current Campbellian norm[1174]; how non-aesthetic experiences, whether immediate or mediated, provoke and create alternative narrative and interpersonal structurings. In short, there is a drive to find a new way of narratisation (and characterisation) that 'speak[s] to us as the real world does'[11751176117711781179].

It is into this interdisciplinary consideration that my autocosmic model of audience engagement with narrative finds its natural home. Drawing as it does upon the 'narrative turn'[1180], cognition studies in narratology[1181] and cross-disciplinary work on the science of narrative

1165 Koenitz, Hartmut *et al.* 'Introduction: The Evolution of Interactive Digital Narrative Theory'. *In:* Koenitz, Hartmut *et al.* (*eds.*), 2015, pp. 67 – 76.
1166 Ryan, Marie-Laure 'On The Worldness Of Narrative Representation' *Expanding Universes: Exploring Transmedial and Tranfictional Ways of World-building International Conference*. Krakow, 2016.
1167 One of the ludology overviews
1168 Koenitz, Hartmut, 2015, p. 56.
1169Felix Schröter and Jan-Noël Thon Video Game Characters
1170 Candy, Linda and Ferguson, Sam (*eds.*) 2014, p. 2.
1171 Koenig, Nikolaus, 2016.
1172 Murray, Janet, 1997, p.111.
1173 Caracciolo
1174 Hartmut Koenitz
1175 Clark, 2011
1176 Koenitz, Hartmut 'The 'Story Arc' – a Ghost of Narrative Game Design'. Melbourne: DiGRA Conference, 2017.
1177 Seller, 2015
1178 Bogost, Ian, 2017.
1179 Calleja, Gordon, 2011, p. 120.
1180 Kreiswirth, Martin, 2005.
1181 Herman 2002

response in both traditionally 'aesthetic' and 'non-aesthetic' arenas, the autocosmic stands as a conceptual and practical framework for seeking the procedural example of 'unaesthetic' experiences in order to build better experiences in 'aesthetic' comp-art. In its narratological focus on comp-art, it (perhaps inevitably[1182]) draws the most on the work of narratologist and digital theorist Marie-Laure Ryan, herself heavily influenced by the narratological work of Roland Barthes[1183], Meir Sternberg[1184] and others straddling the classical/post-classical divide. Ryan, heavily referenced throughout this thesis, has built a framework of 'transmedia narratology'[1185] which not only formalises a character-first, and world-first, approach to narrative[1186], but defines narratives primarily as 'a set of cognitive operations' in the audience, rather than a Formalist, 'verbal' configuration[1187]. For Ryan, this fundamentally decouples the study of narrative (and thus character) from literature and language, and considers how new forms or 'avatars'[1188], particularly works of interactive comp-art, stimulate narrative tendencies in audiences in their own manner through a process of semiotic signification[1189]. She is particularly interested in how this affects 'the fate of traditional narrative patterns in digital culture'[1190], and how interactivity, proceduralism and narrative together might promote a 'functional ludo-narrativism'[1191]. Her work is fundamental to many subsequent narrative and neo-phenomenological structurings that impinge on, and cross over with, the world of videogames and comp-art more generally, including my own[1192][1193][1194]. Ryan's work provides an influential baseline for considering how the narrative faculties of the human mind influence, and shape, models of narrative and characterisation in comp-art.

Despite its influence on my methodology, Ryan's work is not entirely commensurate with my own autocosmic theory. Ryan is sceptical about the 'narrative turn's influence, critiquing the work of other theorists

1182 Enslin
1183 Barthes, Roland *S/Z: An Essay*. London: Farrar, Straus and Giroux, 1991.
1184 cite
1185 Ryan, Marie-Laure 'Transmedia Narratology and Transmedia Storytelling' *Artnodes* 18, 2016 [Online]. Available at: https://artnodes.uoc.edu/articles/abstract/10.7238/a.v0i18.3049/ [Accessed 8th August 2018].
1186 Ryan, Marie-Laure, 2014, p.
1187 Ryan, Marie-Laure *Avatars of Story*. Minnesota: University of Minnesota Press, 2006, p.
1188 Ibid.
1189 Ryan, Marie-Laure, 2014, p.
1190 Ibid.
1191 Avatars of story
1192 Calleja, 2011
1193 Keogh
1194 Caracciolo's book

cited in Chapter 1 of this thesis who espouse a 'post-classical'[1195] cognitivist approach to narrative, and questions the utility of a model of narrative that includes such 'abstractions' as human thought, mental 'experience', 'explanation', and 'representation'[11961197]. Such a model, she fears, creates a 'free-floating'[1198] use of the term which cannot be productively applied to theoretical work. Instead, she proposes the related term 'narrativity', to describe a 'scalar property' of any 'semiotic object' – not just 'strict narratives'[1199] – which by Ryan's reckoning stands to measure the degree of mental narrative excitability that a particular experience or artefact entails[1200] It is in this quality of narrativity, rather than narrative explicitly, that 'experientiality'[1201] – the root of autocosmics, and a large part of resonance – can be found.

My own autocosmic methodology differs from Ryan's position primarily in the fact that its focus is not theoretical, but methodological. The risk of overextension by the 'narrative turn' is something which I recognise[1202]; and in the theoretical workings of narratology, it certainly appears that 'pannarrativism' does often stretch the definition of the term 'narrative' rather thin. For a *methodological* framework, however, such as autocosmics, in use by an artist attempting to find interesting models of narrative engagement within non-aesthetic examples, I am less interested in the semantics of 'narrative' versus 'narrativity', but rather more interested in a free consideration of 'the principal ways we organize our experience of the world'[1203]. Whether an experience, text, object or mental phenomenon is truly 'narrative' or merely has 'narrativity' does not change the nature of its utility to my 'design activity… [which aims] at building a… software product… that satisf[ies] the author and then, consequently, the end-user'[1204]. An 'unaesthetic' experience that has 'narrativity' can still serve a useful model of 'narrative' engagement to a work of 'aesthetic' comp-art; and, by Ryan's own definition of a narrative as that which is deliberately

1195 Richardson, Brian and Herman, David 'A Postclassical Narratology'. *PMLA* 113 (2), 1998, pp. 288 - 290.
1196 Ryan, Marie-Laure 'Towards a definition of narrative'. *In:* Herman, David (*eds.*) *The Cambridge Companion To Narrative.* Cambridge: Cambridge University Press, 2007.
1197 Ritual and narrative
1198 Ryan, Marie-Laure, 2017, p. 528.
1199 Ibid. p.
1200 Abbot, H. Porter *Narrativity*, 2011 [Online]. Available at: https://wikis.sub.uni-hamburg.de/lhn/index.php/Narrativity [Accessed 8th August 2018].
1201 Ryan, Marie-Laure, 2-17, p.
1202 Calleja, Gordon, 2011, p.
1203 Brooks, Peter *Reading for the Plot: Design and Intention in Narrative* Massachusetts: Harvard University Press, 1984, p. ix.
1204 Spierling, Ulrike 'Interaction Design Principles as Narrative Techniques for Interactive Digital Storytelling'. *In:* Koenitz, Hartmut *et al.* (*eds.*), 2015, pp. 159 – 173, p. 170.

designed to induce a narrative comprehension[1205], such an experience would become narrative in being implemented aesthetically, through my own authoring.

Ryan's approach has other differences from my own; focussing more on mediated, 'textual manifestations'[1206], 'tellability'[1207], and the importance of more traditional stances on the 'aesthetic', 'distance', 'belief'[120812091210] and other factors which the autocosmic rejects. Particularly, the tenets of detachment, 'aesthetic distance', the 'magic circle' and 'double-consciousness' explored in the first chapter of this thesis are still strongly ensconced in many narratological theses in game studies and transmedial narratologies[1211121212131214]. I believe that this insistence on a bifurcation of human engagement with imaginatively-stimulating experiences is not only a conceptual problem; it subtly undermines exploration of alternative sources of inspiration for artists such as myself. Instead of 'expand[ing] the concept of narrative to unusable elasticity'[1215], such exploration allows for practical exercises in expanding the modalities of character in comp-art.

In some of Ryan's more recent writing[12161217], I have detected a slight fuzzying of approach: a consideration of whether the strict definition of narrative, 'an analytical concept designed by narratologists', is important for 'most people [to] recognize'[1218]. In an approach that I welcome, she considers the wider concept of narrative (and thus character) as it is defined by cultural studies, and ends the piece on an ambivalent note; unsure as to whether such a broad definition of narrative to include many everyday imaginings is liberating or obfuscating[1219]. It is in this fuzziness that I site my own autocosmic theory. Autocosmics is unconcerned with the 'technical

1205 Passalacqua, Franco and Pianzola, Federico 'Defining transmedia narrative: problems and questions. Dialogue with Mary-Laure Ryan'. *Enthymema* 4 (1), 2011, p.p. 65 – 72, p. 67.
1206 Ryan, Marie-Laure 'Narrative' *In:* Szeman, Imre *et al.* (*eds.*) *A Companion to Critical and Cultural Theory*. London: John Wiley and Sons, 2017, pp. 517 – 531, p. 528.
1207 Ryan, Marie-Laure 'Embedded Narratives and Tellability'. *Style* 20 (3), 1986, pp. 319 – 340.
1208 Ryan, Marie-Laure, 2001.
1209 Ryan, Marie-Laure, 2017, p
1210 Ariosto (need)
1211 Khandaker-Kokoris
1212 Calleja
1213 Caracciolo
1214 Salen and zimmerman
1215 Calleja, Gordon 'Narrative Involvement in Digital Games'. *Conference proceedings from Foundations of Digital Games. Chania, Crete, Greece*. FDG, 2013, p.2 .
1216 Ryan, Marie-Laure, 2017.
1217 Ryan, Marie-Laure 'Ritual Studies and Narratology: What Can They Do For Each Other'. *In:* Nunning, Vera *et al.* (*eds.*) *Ritual And Narrative: Theoretical Explorations and Historical Case Studies.* Berlin: De Gruyter, 2014, pp. 27-50.
1218 Ryan, Marie-Laure, 2017, p. 518.
1219 Ibid. p. 531.

dimensions'[1220] of any Grand Theory of narrative versus narrativity: but is instead concerned with interdisciplinary study into the nature of human response to a wide variety of aesthetic and non-aesthetic stimuli – the 'untold stories' and 'purely mental images' that characterise the response of 'most people'[1221] – and how those responses and stimuli might be applied constructively to the work of artists trying to deliberately excite that response in some manner, particularly through a mode of artistic production that shares more with the experience of functioning worlds than with their static representation.

An autocosmic approach to creating resonant computational characters, then, requires methodological access to the full spectrum of human experience (as long as it possesses, in Ryan's rubric, some degree of 'narrativity'[1222]), in order to consider how its resonance, whether aesthetic or not, can serve as a model for overcoming the challenges of computational narrative – in this case, specifically in the creation of systemic approaches to personhood.

In his provocative article *Video Games Are Better Without Characters*, theorist Ian Bogost asks why the 'representation of individuals, as opposed to systems and circumstances', should be the focus of comp-art. To Bogost, the pursuit of computational characterisation ignores the fundamental representative power of the form: to 'experience a model of some aspect of the world, in a role that forces [us] to see that model in a different light, and in a context that's bigger than [our] individual actions'[1223]. Fundamentally, I agree with Bogost upon the idea of the model, or the system, as the primary representative structure of comp-art: yet I disagree that such systems fundamentally exclude 'the representation of individuals'. Characters – 'non-actual' persons, and indeed real people – can be constituted as systemic; as parts of larger systems, and as systems themselves. The answer to the challenge that Bogost (rightly) points out in his article is not to pursue other types of system – ones that avoid the fundamentals of characterisation – but to find new ways to represent systemic personhood, characters-as-systems – 'personified systems' – resonantly. It is clear that traditional models of character do not suffice in

1220 Ryan, Marie-Laure, 2017, p.528.
1221 Ryan, Marie-Laure, 2017, p. 518.
1222 Ibid. p. 525.
1223 Bogost, Ian, 2017.

this regard; and as this Chapter has demonstrated, attempts to directly and meaningfully represent persons-as-systems (particularly by directly modelling psychological models[1224]) remains a challenging prospect, especially for individual artists. Therefore, the main query of my autocosmic model is as to precisely where else, in the gamut of human mental experience, models of meaningful, narrative, social interaction with personified systems can be found which can be applied metaphorically – in response and as stimuli – to the paradigms of comp-art.

In Chapter 3, the final chapter of this thesis, I will detail how Project `knole` has, as an example of an autocosmic methodology, sought models of human narrative response to 'personified systems' outside of traditional models provided by the 'aesthetic' arts; in some unlikely, but highly resonant, places. As an approach to creating computational character autocosmically, in a way that 'take[s] into account the[ir] cybernetic nature'[1225], it seeks neither technical excellence, nor adherence to strict narrative precepts: rather, it requires a reconsideration of what character – of what a person – can be.

3

"This Foetid and Un-kept Place"

Applying The Autocosmic Method To A Computational Character

Précis

This chapter expands the theory of one particular example of an autocosmic methodology, and how it has informed the development of Project `knole`. By studying human interrelationships with place and environment, rooted in atavistic mental processes and often straddling the demarcation between aesthetic and

1224 Schonbrodt, Felix and Asendorpf, Jens 'The Challenge of Constructing Psychologically Believable Agents'. *Journal of Media Psychology* 23 (2), 2011, pp. 100 – 107.
1225 Calleja 2011

mundane, social and asocial, the design principles for creating virtual environments are proposed as a functionally metaphorical model for the creation of computational characters. Characters are treated as built, systemic environments to be traversed, explored, excavated and modified; in short, to resonate computationally. The ramifications of this 'metaphorical method' are explored both in relation to the `masterbeast` *simulation and the textual and physical elements which support it.*

Section 3.1: The Autocosmic In `knole`

It is important to reiterate the caveats that I made in the previous chapter; the computational character at the heart of Project `knole` remains, in many ways, a standard implementation. I have used many well-established ideas and models from artificial intelligence and game design; perhaps my greatest deviation from those norms lies in the use of natural interfaces, mixed reality techniques and a fusion of different sensor types to expand the modalities of character interaction and expression. Of course, in taking a broader view across the interdisciplines of the sciences and the arts, beyond videogames, 'unconventional' control schemes and interfaces are no longer novel[12261227].

Alongside these established design methods, however, the general concept of the autocosmic has provided me with the opportunity – the permission, even – to explore many interesting avenues in my research. An artist seeking inspiration and methodologies autocosmically looks for as wide a gamut of exemplars as possible, from across human experience, and deliberately away from the precepts of their aesthetic discipline. The autocosmic is not a prescription; it is nothing more than a mood, a 'stance', in Dennett's sense of the word[1228], towards an artist's own creative procedure. It enforces no structures, and counsels no specific technique, only requiring an interdisciplinary promiscuity in methodology, beyond subject matter or style. For `knole`, this has meant prowling the borders of different discourses in which the human imagination engages with 'persons', either real or imaginary; particularly in those discourses where those persons are experienced, or represented, systemically.

1226 Need a citation for this?
1227 Second citation
1228 Dennett, Daniel *The Intentional Stance*. Massachusetts: The MIT Press, 1998.

This 'stance' has predictably led me to an unconventional variety of different influences, research topics and areas of interest. An artist's touchstones are not always, or ever exhaustively, delineated, and their presence may be barely felt in the final work, despite their importance to its development. In my case, such touchstones included the study of subjects as disparate as human-animal relationships[1229][1230][1231][1232][1233][1234][1235], ethology[1236], euthanasia studies[1237][1238][1239], toy studies[1240][1241][1242] (particularly electronic toys and other 'relational artefacts' where 'personalities and responses... [were] real and hard-coded'[1243][1244][1245][1246][1247]), human-robot

1229 Derrida, Jacques *et al.* (*eds.*) *The Animal That Therefore I Am*. New York: Fordham University, 2008.
1230 Sherman, Robert *Yoki*, 2016 [Online]. Available at: http://bonfiredog.co.uk/bonfog/2016/07/15/1739/ [Accessed 25/04/19].
1231 Herman, David *Narratology Beyond The Human: Storytelling and Animal Life*. Oxford: Oxford University Press, 2018.
1232 Hediger, H., Sircom, G. (*trans.*) *Wild Animals In Captivity*. New York: Dover, 1964.
1233 Etchells, Pete *Our complicated relationship with cats,* 2013 [Online]. Available at: http://www.theguardian.com/science/head-quarters/2013/sep/12/neuroscience-psychology [Accessed 18th August 2018].
1234 Gjersoe, Nathalia *Dogs: An Uncomplicated Relationship*, 2013 [Online]. Available at: http://www.theguardian.com/science/head-quarters/2013/sep/23/dogs-uncomplicated-relationship-research [Accessed 18th August 2018].
1235 Sherman, Robert *A Talk Given To The Bath Spa Empathy Research Group, 29th February 2016,* 2016 [Online]. Available at: http://bonfiredog.co.uk/bonfog/2016/03/25/a-talk-given-to-the-bath-spa-empathyresearch-group-29th-february-2016/ [Accessed 8th August 2018].
1236 McFarland, David *Animal Behaviour*. London: Longman, 1993.
1237 Villalobos, Alice *Quality Of Life Scale*, 2004 [Online]. Available at: http://www.aplb.org/resources/quality-of-life_scale.php [Accessed: 8th August 2018]
1238 Jones-Fairnie, Helen 'Book Review: Compassion Fatigue in the Animal Care Community'. *Australian Veterinary Journal* 86 (5), 2008.
1239 Bride, Brian E. 'Book Review: Compassion Fatigue in the Animal-Care Community' *Traumatology* 14 (1), 2008.
1240 Cook, Ian, and Tara Woodyer. 'Lives of things.' *In: Wiley-Blackwell Companion to Economic Geography. Oxford: Wiley-Blackwell,* 2012, pp. 226-241.
1241 Francis, Andrea P. and Mishra, Punya 'Differences in Children's Verbal Responses and Behavioral Interactions with Anthropomorphic Artifacts', 2008.
1242 Watson, Rachel 'Little girl's fear of 'evil' lurking in cute Furby'. *Daily Mail*, 10/02/14.
1243 Turkle, Sherry, 2005, p.
1244 Marenko, Betti 'Neo-Animism and Design: A New Paradigm in Object Theory' *Design And Culture* 6 (2), 2014, pp. 219 – 242.
1245 Harley. David, *Watching The Furby Fly*, 2015 [Online]. Available at: http://itsecurity.co.uk/2015/09/watching-the-furby-fly/ [Accessed 8th August 2018].
1246 Batchelor Warnke, Melissa *Why We Were Addicted to Our Tamagotchis*, 2015 [Online]. Available at: https://www.vice.com/en_uk/read/in-praise-of-tamagotchi-683 [Accessed 18th August 2018].
1247 Sherman, Robert *Empathy Machines: Love, Guilt and Paracosmics in Interactive Characters*, 2016 [Online]. Available at: http://bonfiredog.co.uk/bonfog/2016/05/20/empathy-machines-love-guilt-and-paracosmics-in-interactive-characters/ [Accessed 8t h August 2018].

interaction across many domains[1248124912501251125 2] and use cases[1253125412551256125712581259], chatbots[126012611262], imaginary friends[12631264], videogame 'bots'[126512661267], automata and early animatronics[126812691270], dehumanisation[1271], mechanomorphism[12721273] and compassion fatigue[127412751276], amongst others. All of these discourses provided alternative, sometimes-surprising insights into the way human beings resonantly engage with other people, imaginary beings, constructed entities

1248 Canamero, Lola and Lewis, Matthew 'Making New "New AI" Friends: Designing a Social Robot for Diabetic Children from an Embodied AI Perspective'. *International Journal Of Social Robotics* 8 (4), 2016, pp. 523 - 537

1249 Lee, Vivien *Feeling lonely and isolated? Can a virtual pet companion help? - GeriJoy*, 2015 [Online]. Available at: http://www.gerijoy.com/feeling-lonely-and-isolated-can-a-virtual-pet-companion-help/ [Accessed 18th August 2018].

1250 Waytz, Adam and Norton, Michael *How to Make Robots Seem Less Creepy*, 2014 [Online]. Available at: http://www.wsj.com/articles/how-to-make-robots-seem-less-creepy-1401473812?tesla=y&mg=reno64-wsj&url=http://online.wsj.com/article/SB10001424052702303627504579557683237189354.html [Accessed 11th August 2018].

1251 Rosenthal von der Putten, Astrid and Kramer, Nicole C. 'How design characteristics of robots determine evaluation and uncanny valley related responses'. *Computers In Human Behaviour* 36 (1), 2014, pp. 422 – 439.

1252 Fink, J. *et al.* 'Anthropomorphic Language in Online Forums about Roomba, AIBO and the iPad'. *In: Proceedings of the 2012 IEEE International Workshop on Advanced Robotics and its Social Impacts* Munich: IEEE, 2012.

1253 Hendrick, Bram *et al.* 'Robot Vacuum Cleaner Personality and Behavior'. *International Journal of Social Robotics. 3 (1), 2011, pp. 187 – 195.*

1254 *Paro Robots*, 2014 [Online]. Available at: http://www.parorobots.com/ [Accessed 18th August 2018].

1255 Brazeal, Cynthia *Designing Sociable Robots*. Massachusetts: The MIT Press, 2004.

1256 Wiseman John *Braitenberg Vehicles: Simulator Runs,* 1998 [Online]. Available at: http://people.cs.uchicago.edu/~wiseman/vehicles/test-run.html [Accessed: 18th August 2018].

1257 Herath, Damith *et al. (eds.) Robots and Art: Exploring an Unlikely Symbiosis*. Germany: Springer, 2016.

1258 The Stem

1259 Novikova, Jekaterina *et al.* 'Emotionally expressive robot behavior improves human-robot collaboration' 24th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN), 2015.

1260 Weizenbaum, Joseph 'ELIZA - A Computer Program For The Study of Natural Language Communication Between Man And Machine' *Communications Of The ACM* 9 (1), 1966, pp. 36 – 45.

1261 Humphrys, Mark *How my program passed the Turing Test*, 2008 [Online]. Available at: http://computing.dcu.ie/~humphrys/Turing.Test/08.chapter.html [Accessed 8th August 2018].

1262 Sherman, Robert *A Lifetime With Dom*, 2016 [Online]. Available at: http://bonfiredog.co.uk/bonfog/2016/06/07/a-lifetime-with-dom/ [Accessed 8th August 2018].

1263 Taylor, Marjorie 'Children's Imaginary Companions: What is it Like to Have an Invisible Friend?' *In: Handbook of Imagination and Mental Simulation*. London: Routledge, 2008.

1264 Hoff, Eva V. 'Imaginary Companions, Creativity and Self-Image in Middle Childhood'. *Creativity Research Journal* 17 (2-3), pp. 167 – 180.

1265 Khoo, Aaron and Zubek, Robert, 2002.

1266 Partington, Samuel J. and Bryson, Joanna J. 'The Behavior-Oriented Design of an Unreal Tournament Character'. University of Bath.

1267 Hingston, Philip (*eds.*) *Believable Bots: Can Computers Play Like People?* Heidelberg: Springer, 2012.

1268 Riskin, Jessica *Frolicsome Engines: The Long Prehistory of Artificial Intelligence*, 2016 [Online]. Available at: http://publicdomainreview.com/2016/05/04/frolicsome-engines-the-long-prehistory-of-artificial-intelligence/ [Accessed: 18th August 2018].

1269 Groeneveld, Leanne 'A Theatrical Miracle: The Boxley Rood of Grace as Puppet'. *Early Theatre* 10 (2), 2007, pp.1 – 40.

1270 McCorduck, Pamela, 1979

1271 Haque, Omar Sultan and Waytz, Adam 'Dehumanization in Medicine: Causes, Solutions and Functions'. *Perspectives on Pscyhological Science* 7 (2), 2012, pp. 176-186

1272 Karlsson, F. 'Anthropomorphism and mechanomorphism'. *Humanimalia* 3 (2), 2012, pp. 107 – 122.

1273 Sherman, Robert *February 12th, 2016*, 2016 [Online]. Available at: http://bonfiredog.co.uk/bonfog/2016/02/12/1532/ [Accessed 8th August 2018].

1274 Kolthoff, Kay L. And Hickman, Susan E. 'Compassion fatigue among nurses working with older adults'. *Geriatric Nursing* 20 (1), 2016, pp. 1 -4.

and experiences that truly stretch the definitions of what could be considered interpersonal interaction.

However, the focus of this chapter lies along the line of enquiry that has most indelibly coloured the development and construction of Project `knole` as a work of artistic, computational characterisation, and which has provided, from its autocosmic roots, a model for computational character. This enquiry concerns the imaginative human relationship with *environments*. 'Environment', here, covers a wide range of concepts, from the most general ideas of 'space' to more specific definitions of 'place', 'worlds'[1277], 'locales' and 'surroundings'. It includes aesthetic environments, 'landscapes', as well as more systemic, relational conceptions, from the scientific definitions of 'ecosystem' to the object-oriented literary theories of the Russian school[12781279]. Together, however, the autocosmic consideration of all such *environments* represents how the human imaginative relationship with space and place stands as 'one of the most powerful affective devices' in our species' history[1280]; and how it can be used as an alternative model for developing character computationally.

Section 3.2: A Brief History Of Humanity's Complex Relationship With Space

1275 LeDoux, Kathleen 'Understanding compassion fatigue: understanding compassion' *Journal of Advanced Nursing* 71 (9), 2015, pp. 2041 – 2050.
1276 Najjar, Nadine *et al.*'Compassion Fatigue: A Review of the Research to Date and Relevance to Cancer-care Providers'. *Journal of Health Psychology* 14 (2), 2009, pp. 267 – 277.
1277 Ryan, Marie Laure, 2001, p.91.
1278 Pavel florensky
1279 Language of new media (manovich on russians)
1280 Martin, Gareth Damian, 2016.

The overambition of this section's title is partly deliberate, and partly unavoidable. To encompass the ways in which humanity has related to, inhabited, modified and imagined the environments in which it lives and thinks, 'however narrowly or broadly conceived'[1281], would require a completionist survey of geography, literary theory, biology, anthropology, sociology, ecology, narratology, philosophy, cognitive science, religious studies and neuroscience, amongst many other sub-categories which, between these monolithic subjects, 'conjoin... in new interdisciplinary formations'[1282]: literary geography[1283], environmental literary criticism[1284], heritage interpretation[1285][1286], 'imaginative geography, literary cartography, geocriticism, geopoetics, geohumanities'[1287], actor-network theory[1288][1289], possible world studies[1290][1291], ecocriticism[1292], general systems theory[1293], biosemiotics[1294], the environmental humanities[1295], neophenomenology[1296][1297], landscape phenomenology[1298][1299][1300], ecofeminism[1301], cybernetics[1302][1303], speculative realism[1304], situated,

1281 Tally Jr, Robert and Battista, Christina M. 'Introduction: Ecocritical Geographies, Geocritical Ecologies, and the Spaces of Modernity'. *In* Tally Jr, R and Battista, CM (*eds.*) *Ecocriticism and Geocriticism: Overlapping Territories in Environmental and Spatial Literary Studies*. Basingstoke: Palgrave Macmillan, 2016, p. 2.
1282 Jones, Owain. *What Are The Environmental Humanities? And history of the term?* 2017 [Online]. Available at: https://ecologicalhumanities.wordpress.com/what-are-the-environmental-humanities-definition-of-the-environmental-humanities/ [Accessed 8th June 2019].
1283 Alexander, Neil. 'On Literary Geography'. *Literary Geographies* 1 (1), 2015.
1284 Tally Jr, Robert and Battista, Christina M, 2016.
1285 Olsen, Bjonar and Petursdottir, Thora (*eds.*) *Ruin memories: Materialities, Aesthetics and the Archeology of the Recent Past*. Oxon: Routledge, 2014.
1286 Moscardo, Gianna 'Interpretation, Culture and the Creation of Place'. *Tourism Recreation Research* 32 (3), 2007, pp. 57 – 64.
1287 Alexander, Neil, 2015.
1288 Allen, Casey D. 'On Actor-Network Theory and Landscape'. *Area* 43 (3), 2011, pp. 274-280.
1289 Latour, Bruno *Reassembling The Social.: An Introduction To Actor-Network Theory*. Oxford: OUP, 2005.
1290 Ryan, Marie Laure, 2013.
1291 Wolf, Mark J., 2016.
1292 Tally Jr, Robert and Battista, Christina M, 2016.
1293 Von Bertalanffy, Ludwig *General System Theory: Foundations, Development, Applications*. New York: George Braziller, 1976.
1294 Kull, Kalevi *et al.*, 2009, pp.167–173.
1295 Rose, Deborah Bird *et al.* 'Thinking Through The Environment, Unsettling The Humanities'. *Environmental Humanities* 1 (1), 2012, pp. 1 – 5.
1296 Caracciolo, Marco 'The Reader's Virtual Body: Narrative Space and its Reconstruction'. *Storyworlds* 3, 2011, pp. 117 – 138.
1297 Ingold, Tim. *The Perception Of Environment: Essays On Livelihood, Dwelling And Skill*. London: Routledge, 2002.
1298 Reinhard, Andrew 'Landscape Archaeology in *Skyrim VR*'. *In:* Champion, Erik M (*eds.*) *The Phenomenology of Real and Virtual Places*. UK: Routledge, 2018, pp.
1299 Tilley, Christopher. *A Phenomenology of Landscape: Places, Paths and Monuments*. Berg, 1994.
1300 Alexander, Neal, 2015.
1301 Lioi, Anthony 'Of Swamp Dragons: Mud, Megalopolis and a Future for Ecocriticism'. *In:* Ingram, Annie M. *et al (eds.) Coming into Contact: Explorations in Ecocritical Theory and Practice*. Georgia: University of Georgia Press, 2007, pp. 17 – 38.
1302 Heylighen, Francis 'Cybernetics and Second-Order Cybernetics'. *In:* Meyers, R A (*eds.*) *Encyclopedia of Physical Science and Technology*. New York: Academic Press, 2001, pp. 1 – 24.
1303 Haraway, Donna *A Cyborg Manifesto*. Minnesota: University of Minnesota Press, 2016.
1304 Speculative realism

grounded and embodied cognition[1305][1306], cultural geography[1307], spatial and platial studies[1308][1309]... Indeed, even this review would not be enough. Beyond such 'postclassical' or postmodern intellectual movements and discourses, there is most likely not a single domain of human interest that is not coloured by our role as 'bodies located in space'[1310].

The above disciplines, then, only represent those particular ports of call into which my autocosmic research happened to lead me: disciplines that are particularly interested in how humans relate to, use and interact with their surroundings. They are disciplines that have been most affected (some even born from) the 'spatial' or 'spatiotemporal turn'[1311][1312][1313][1314] in academia in recent decades – in which environment, space and place are enlarged beyond the role of 'empty container'[1315][1316] into other, livelier objects of study. To such disciplines, environments are rich, systemic phenomena subject to 'embodied, emotional, and intersubjective engagements guided by socio-cultural practices'[1317]: in short, environments are an important component of human social, mental, physical and imaginative activity across cultures, historical periods and specialisms. Alongside the fact that such disciplines often lie far beyond traditional formal or methodological considerations for narrative artists, the 'spatial turn' represents a rich seam for autocosmic study.

This section is not, then, designed to circumscribe a field, or provide a complete historiography. Though it stretches from humanity's

1305 Barsalou, Lawrence, 2008.
1306 Wilson, Margaret 'Six views of embodied cognition'. *Psychonomic Bulletin & Review* 9 (4), 2002, pp. 625 – 636.
1307 Tuan, Yi-Fu *Space and Place: The Perspective Of Experience.* Minnesota: University of Minnesota Press, 2001.
1308 Champion, Erik. *Playing With The Past.* London: Springer, 2011.
1309 Ewalt, Joshua. 'Mapping And Spatial Studies', *Oxford Research Encyclopedias,* 2017 [Online]. Available at: https://oxfordre.com/communication/view/10.1093/acrefore/9780190228613.001.0001/acrefore-9780190228613-e-651 [Accessed 27th November 2019].
1310 Ryan, Marie-Laure *Cyberspace, Cybertexts, Cybermaps*, 2004 [Online]. Available at: http://www.dichtung-digital.de/2004/1/Ryan/index.htm [Accessed 25th November 2019].
1311 Jameson, Fredric *Postmodernism, or the Cultural Logic of Late Capitalism.* USA: Duke University Press, 1991, p. 154.
1312 Westphal, Bertrand, Tally Jr, Robert *(trans.) Geocriticism: Real & Fictional Spaces*. New York: Palgrave Macmillan, 2007.
1313 Guldi, Jo *What is the Spatial Turn?* [Online] Available at: http://spatial.scholarslab.org/spatial-turn/what-is-the-spatial-turn/ [Accessed: 25th August 2019].
1314 Withers, Charles W J. 'Place and the "Spatial Turn" in Geography and in History. *Journal Of The History Of Ideas* 70 (4), 2009, pp. 637-658.
1315 Rao, Eleanora 'Mapping The Imagination: Literary Geography'. *Literary Geographies* 3 (2), 2017, pp. 115-124, p. 119.
1316 Caracciolo, Marco 'Narrative Space and Reader's Responses To Stories'. *Style* 47 (4), 2013, pp. 425-444.
1317 Ibid. pg.

early years to the modern day, it is patchy in its attentions: unsurprisingly, the years of the mid-18th century in England receive disproprotionate focus. It does, however, serve several general purposes. It demonstrates the growing interpenetration of different disciplines studying the biological, and cultural, evolution of human engagement with place from often-disparate angles of attack – with all the ensuing linkages, overlappings and surprising fusions. It demonstrates much of the research that informed the emergence of knole's fiction. It provides me with an appropriately autocosmic gamut of influences and potential methodologies for my work, unbound by traditional aesthetic or disciplinary concerns. Finally, it demonstrates the following qualities of human engagement with space that allows me to develop the particular autocosmic methodology that lies at the heart of this thesis.

1) Our engagement with space is autocosmic.

Human beings relate to and act upon the environments they inhabit (both real and fictional) through embodied cognitive processes which are inherently narrative in nature, and which fail to strictly preserve the arbitrary boundaries between believed and fancied, true and false, aesthetic and functional;

2) Spaces have differing levels of resonance.

As with other autocosmic experiences, particularly those in art, spaces can resonate with our imaginative faculties to different degrees and in different manners, influenced by species-wide, culturally-specific and entirely personal narrative factors.

3) Our engagement intimately involves the systemic nature of environment.

Environments are best represented, and understood, systemically and relationally; as actively procedural networks of phenomena that have emergent functionality, can enact and be enacted upon. Much of our imaginative engagement with them hinges upon these facts.

4) Frequently, that engagement is strongly characterised.

Often, and for a variety of cultural and biological reasons, our engagement with environments and ecosystems has taken the form of a social or parasocial relationship between persons; the complexity and interactivity of environments has lent to them many of the features of personhood in the minds and actions of those who perceive them. They take on, in these instances, a *systemic personhood*.

* * * * *

Chapter 1 of this thesis delineated much of the post-classical theory mapping autocosmic human relationships with the environment; an embodied, cognitive, intellectual, emotional, social and imaginative engagement, evolved from necessary adaptations to the complex 'surround'[1318] towards which, and within which, we have always existed[1319]; as both component and, in our own minds, subject[1320]. It is a relationship that combines sensory data with mental simulation; the material, 'operational'[1321] 'umwelt'[1322] that exists outside ourselves, and the 'innenwelt'[1323] or 'cognised environment'[1324] that exists in imaginative blueprint within us.

It is unsurprising that such an engagement evolved in many animals, not least human beings. The environments of Earth are neither stable, static nor domesticated: they are a moil of procedures, a network of mutable relationships[1325], of enactments and actants[1326], of occult cause and effect. Sensing their entirety, and mapping that entire sense dataset, is impossible. Even understanding them sufficiently to avoid death (a genotypic undesirability) is difficult. As an evolving 'component of [such]

1318 Emmeche, Claus, 2001, p. 653.

1319 McFarland, David. *Animal Behavior: Psychobiology, Ethology and Evolution.* USA: Longman, 1999, p. 35.

1320 Econarratology caracciolo character

1321 Rappaport, Roy. *Ritual and Religion in the Making of Humanity.* Cambridge: Cambridge University Press, 1999, p. 19.

1322 Sharov, Alexei A., 2010, p. 1050.

1323 Ibid.

1324 Rappaport, Roy, 1999, p. 19.

1325 Bird-David, Nurit. '"Animism" Revisited: Personhood, Environment and Relational Epistemology'. *Current Anthropology* 40 (1), 1999, pp. 67 – 91.

1326 Latour, Bruno, 2005.

systems[s] of trophic exchange"[1327], human beings inevitably developed embodied, cognitive and biochemical systems to manage relations with their environment; to catalogue and model its components into 'emergent constellations'[1328] of knowledge, 'relational epistemologies'[1329] developed from birth; modelling previous observations[1330] and feeding them into simulations[1331] of future scenarios; finding patterns, making maps[1332], and extrapolating those elements that cannot be experienced directly[1333].

As Chapter 1 of this thesis describes in more detail, such imaginative interpretation most frequently takes on narrative or (as Ryan might insist[1334]) narrativist form. It is a modelling, 'stabilisation'[1335] and deduction of networks of meaning from the complex and fragmentary 'cosmos'[1336] that we perceive about ourselves, arranged into causal and eventful linkages for internal (or external) comprehension; comprehension that privileges certain features above others, corresponding to our evolved priorities as a species. In short, certain environments, or elements of environments, resonate narratively more than others.

Landscape studies has much to say on this subject – why, for example, certain spaces become 'places'... imbue[d]... with meaning'[1337], rather than others[1338][1339] – but the focus of this thesis remains on the central, perhaps defining feature of narrative comprehension, and thus of the environments we inhabit: the doings and thinkings of sentient agents or actors within that space. Chapter 1 described how evolutionary pressures gave rise to a wealth of physical and mental apparati, which privilege the imaginative incorporation of agents above all other stimuli in an

1327 Rappaport, Roy, 1999, p. 100.
1328 Herman, David
1329 Bird-David, Nurit, 1999.
1330 Shepard, Paul and Shepard, Florence. *Coming Home To The Pleistocene*. Washington D.C.: Island Press, 1998.
1331 Kitchin, Rob and Freundschuh, Scott. 'Cognitive mapping'. *In:* Kitchin, Rob and Freundschuh, Scott (*eds.*). *Cognitive Mapping: Past, Present and Future.* London: Routledge, 2000, pp.
1332 Downs, Roger and Stea, David. *Image & environment: Cognitive mapping and spatial behavior*. New York: Routledge, 1973.
1333 Morriss-Kay, Gilliam M. 'The evolution of human artistic creativity'. *Journal of Anatomy* 216 (2), 2010, pp. 158 – 176.
1334 Ryan, Marie-Laure, 2017, p. 528.
1335 Kull, Kalevi *et al.,* 2011, p.34.
1336 Nash, Christopher, 1987, p.8.
1337 Champion, Erik
1338 Gieryn, Thomas F. *Truth-Spots: How Places Make People Believe*. Chicago: University of Chicago Press, 2018
1339 Foote, Kenneth and Azaryahu, Maoz. 'Toward A Geography of Memory: Geographical Dimensions of Public Memory and Commemoration'. *Journal of Political And Military Sociology* 35 (1), 2007, pp. 125 – 146.

environment. However, such 'hyperactive agency detectors'[1340] often overcompensate[1341][1342][1343][1344][1345], a 'heuristic sensitivity'[1346] that causes human beings to frequently detect other agents even where none are present. This overcompensation is common in evolved traits; 'false positives'[1347] preferable, evidently, to fatal inaction[1348]. They foster an 'intentional stance'[1349] towards the world – a tendency to navigate our lives via the semiotic nodes of other beings, real or imagined. It is this stance, for many thinkers including cultural geographer Yi-Fu Tuan, that 'lies at the foundation of all human culture'[1350].

For functionalist, constructivist thinkers such as Tuan, and Daniel Dennett (who originated the nomenclature of 'stances'[1351]) it is our often-mistaken attributions of agency to the world around us – through animism[1352], anthropomorphism[1353], pareidolia[1354] and other mental phenomena[1355][1356][1357][1358] - that sowed the seeds of future cultural practices; from 'protoreligions'[1359] and superstitious activities, to religious beliefs[1360], and to what is commonly thought of as artistic, aesthetic practice in the modern sense. In that hazy, initial interchange between internal and social broadcast of narrative structures 'beyond individual understanding'[1361][1362],

1340 Barrett, Justin *Why Would Anyone Believe In God?* Altamira: Walnut Creek, 2004, p.31.
1341 Scheele, Dirk *et al.* 'A human tendency to anthropomorphize is enhanced by oxytocin'. *European Neuropsychopharmacology* 25 (10), 2015, pp. 1817 – 1823.
1342 Guthrie, Stewart. *Faces In The Clouds: A New Theory Of Religion*. New York: OUP, 1993.
1343 Farah, Martha and Heberlein, Andrea. ' Personhood and Neuroscience: Naturalizing or Nihilating?' *The American Journal of Bioethics* 7 (1), 2007, pp. 37 – 48.
1344 Boyer, Pascal ' Religious Thought and Behaviour as By-Products of brain function'. *Trends in Cognitive Sciences* 7, 2003, pp. 119 – 124.
1345 Shermer, Michael *Why People Believe Weird Things.* USA: Henry Holt, 1997.
1346 Blom, 2010
1347 Fodor, Jerry 'Chapter 44: The Modularity of Mind:An Essay on Faculty Psychology' *In:* Adler, Jonathan and Rips, Lance (*eds.*) *Reasoning: Studies of Human Inference and Its Foundations.* Cambridge: CUP, 1983, p. 893.
1348 Subbotsky, Eugene 'The Belief In Magic In The Age Of Science'. *SAGE Open* 4 (1), 2014.
1349 Dennett, Daniel *The Intentional Stance*. Massachusetts: The MIT Press, 1987.
1350 Tuan, Yi-Fu 'Escapism', *Archis*, 2002 [Online]. Available at: http://volumeproject.org/escapism/ [Accessed 3rd December 2019].
1351 Dennett, Daniel, 'Intentional Systems'. *The Journal of Philosophy* 68 (4), 1971, pp. 87-106.
1352 Heider, Fritz and Simmel, Marianne 'An Experimental Study of Apparent Behaviour'. *The American Journal of Psychology* 57 (2), 1944, pp. 243 – 259.
1353 Guthrie, Stewart, 1993.
1354 Blom, 2010
1355 Gao, Tao and Scholl, Brian. 'Chasing vs. Stalking: Interrupting the perception of animacy'. *Journal of Experimental Psychology* 37 (3), 2011, pp. 669 – 684.
1356 Gao, Tao *et al.* 'The psychophysics of chasing: A case study in the perception of animacy'. *Cognitive Psychology* 59 (2), pp. 154 – 159.
1357 LeDoux, Joseph 'The Emotional Brain: From Soul To Synapses' *Biological Psychiatry* 55, 2004, pp.
1358 Barrett, Justin 'Cognitive Science of Religion: What Is It & Why Is It?' *Religion Compass* 1 (1), 2007.
1359 Dennett, Daniel *Breaking The Spell: Religion as a Natural Phenomenon*. London: Penguin, 2006, p. 107.
1360 Morris, Desmond *The Artistic Ape: Three Million Years Of Art*. Chichester: Red Lemon, 2013.
1361 Krippendorf, Klaus 'On The Essential Contexts Of Artifacts or on the Proposition That "Design Is Making Sense (Of Things)'. *Design Issues* 5 (2), 1989, pp. 9 – 39, p.
1362 Layton, Robert *The Anthropology Of Art*. Cambridge: Cambridge University Press, 1991.

our 'intentional stance' towards our environment proved an advantageous approach. Dennett in particular charts the memetic persistence of particularly resonant narratives about the world through generations of culture[1363]; many of the most persistent drawing directly on the character-led perceptions of personhood, and agency, in our lived spaces. Even though often factually mistaken, such transmitted structures of meaning served surprisingly well as 'mnemonic... encod[ings of] the environment's'[1364] ferocious structural complexity. By using the comparable complexities of human social life as a functional metaphor for how the non-human world functioned[1365], early human societies struck upon codes of behaviour and systems of knowledge that served them well: well enough for evolution, at least (both biological and cultural) to select for them again and again. The act of rationalising opaque environmental systems as the presence and society of human-like beings, acting in human-like ways, provided early humans with a schematic for not just surviving, but for flourishing on a dangerous planet. This schematic did not just serve well enough for avoiding danger and finding food; it helped an introspective human animal to collectively pursue the epistemological quest to categorise and map the numinous, the metaphysical, and the 'transcendant or higher truths' or 'logos'[1366] beyond everyday concerns[136713681369].

Examples of such personificiation, and socialisation, of the non-human environment can be found across the history of our species, in every time period, and at every resolution or 'punctualization'[1370] of that environment. Animal species, as ecological components that already display some of the features of personhood, are often the focus of characterisation, as a means of modelling the workings of the world that matter most to traditional societies. In such conceptions, animals are not mere resources, mobile *bestand*[1371] or dumb beasts; they possess 'relational personhood'[1372],

1363 Dennett, Daniel, 2013, p.
1364 Sagan, Carl. *The Demon-Haunted World*. USA: Random House, 1997.
1365 Layton, Robert, 1991, p. 37.
1366 Rappaport, Roy, 1999, p.
1367 Levi-Strauss, Claude, Needham, Rodney (*trans.*). *Totemism*. London: Random House, 1971, p.
1368 Harari, Noah Yuval. *Sapiens: A Brief History Of Humankind*. London: Harper, 2014, p.
1369 Robinson, Margaret 'Animal Personhood in Mi'kmaq Perspective'. *Societies* 4 (4), 2014, pp.672-688.
1370 Cressman, D. 'A Brief Overview of Actor-Network Theory: Punctualization, Heterogenous Engineering And Translation'. *SFU.CA*, 2009 [Online]. Available at: https://summit.sfu.ca/item/13593 [Accessed: 3rd December 2019].
1371 Kennedy, Tara 'The Ethics of Treating Animals as Resources: A Post-Heideggerian Approach'. *Frontiers Of Pholosophy In China* 11 (3), 2016, pp. 463-482.
1372 Bird-David, Nurit '"Animism" Revisited: Personhood, Environment and Relational Epistemology'. *Current Anthropology* 40 (1), 199, pp.67 – 91, p. 67.

functioning as 'siblings and persons'[1373][1374] whose hunting was a social interaction, an 'intimate psycho-emotional interdependency'[1375] that had to be managed effectively[1376][1377][1378][1379][1380]. The bevy of zoomorphic, therianothropic, anthropomorphic and totemistic beliefs across human culture[1381][1382][1383] testify to the role of animals, in an autocosmic sense, as equals in the great ecological drama playing out in human storytelling: whether in and of themselves, or as tools to 'symbolize, dramatize, and illuminate aspects of humans' experience and fantasy'[1384].

Our socialising, intentionalising imaginations are not restricted to other animals, whose volition, agency and 'being-ness' is arguably self-evident. We are also capable of imagining the traits of character in other forms of life: even in the abstract processes and non-vital landscapes that most commonly form 'the environment'. From early superstitious practices to the convoluted scriptural authority of modern religion, there are countless examples of ecologies and environments, in part or wholly, being reified as entities towards which human beings have a social connection; as 'supernatural agents… whose approval is to be sought'[1385].

From the 'full-scale Earth Mother tradition' of early Neolithic societies[1386][1387][1388] to the construction of places of worship, from their earliest forms, as 'purpose-built abodes… [for] the newly invented supernatural forces'[1389]; from the *kami* of Shinto Japan[1390] to the *lares* and

1373 Robinson, Margaret, 2014, p.
1374 Nadasdy, Paul 'The gift in the animal: The ontology of hunting and human-animal sociality'. *American Ethologist* 34 (1), 2007, pp.25 – 43.
1375 Hodgson, Derek 'Closely Observed Animals, Hunter-Gatherers, and Visual Imagery in Upper Paleolithic Art'. *Evolutionary Studies in Imaginative Culture* 1 (2), 2017, pp. 59 – 72.
1376 Nadadsy, Paul, 2007.
1377 Levi Strauss, Claude, 1971, p.
1378 Westling, Louise '"Darwin in Arcadia: The Human Animal Dance from Gilgamesh to Virginia Woolf'. *Anglia* 124 (1), 2006, pp. 11 – 43.
1379 Harvey, Graham *Animism: Respecting The Living World.* Australia: Wakefield Press, 2005, p.
1380 Fritz, Carole and Tosello, Gilles. 'From gestures to myth: artist's techniques on the walls of Chauvet cave'. *Palethnology* 7 (1), 2015, pp.208 – 314.
1381 Anti-Weiser, Walpurga. 'Beyond hides and bones – Animals, animal representations and therianthropic figurines in palaeolithic art'. *Annalen* 120 (1), 2018, pp. 51 – 70.
1382 Serpell, James 'Animal-assisted interventions in historical perspective'. *In:* Fine, Aubrey (*eds.*) *Handbook on Animal-Assisted Therapy.* London: Elsevier, 2010, pp. 17 – 32.
1383 Morris, Desmond, 2013, p.
1384 Daston, Lorraine and Mitman, Gregg. *Thinking With Animals: New Perspectives on Anthropomorphism.* Columbia: Columbia University Press, 2005.
1385 Dennett, Daniel, 2013, p.
1386 Glob, Peter Vilhelm 'The Bog People: Iron-Age Man Preserved'. London: Faber and Faber, 1969, p.
1387 Morris, Desmond, 2013, p.
1388 Hubbs, Joanna *Mother Russia: The Feminine Myth in Russian Culture.* Indiana: Indiana University Press, 1993, p.
1389 Morris, Desmond, 2013, p.
1390 Ono, Sokyo *Shinto: The Kami Way*. USA: Tuttle, 1962

genius loci of Greek and Roman thought[1391][1392]; from Vishnu as the 'all-pervasive' and cosmic vector, materialised in his various avatars, in the Vedic cosmology[1393], to Ra's journey across the sky explicating the sun's passage in Egyptian mythology[1394]. Greek mythology has Gaea, the singular Mother Earth[1395][1396]; Mesoamerican belief structures have environmental gods like Chaac and Xipec Totec[1397][1398]. Thousands of other examples exist, of human-like beings – fully persons - that are perceived to control, inhabit, embody or personify systemic elements of our surroundings. In such belief structures, different parts of the environment (or the entire universe itself) is constituted by, occupied by and transformed into the domains, bodies and occupations of whole pantheons of gods, spirits and other human-adjacent 'vitalities'[1399]. From the weather to the water, the soil to the sky; the world is understood as a social arena, or a character in and of itself, as much as an ecological system.

The utility of such a narrative framework, however, is not just to organise knowledge. It facilitates an appropriate, meaningful form of interaction with the world, and supports a sense of agency within an unpredictable environment which, unavoidably and emergently, acts upon us, and which can be acted upon in turn[1400][1401][1402]. Knowing how and when to act within the ecosystem is vital to any animal's survival; and the socialised metaphors upon which much early human thought rested provided a functional, 'internal[ly] consisten[t]'[1403][1404] cosmology for that knowledge, and that action.

1391 Alexander, Neal, 2015.
1392 Petzet, Michael 'Genius Loci – The Spirits of Monuments and Sites'. *16th ICOMOS General Assembly and International Symposium: 'Finding the spirit of place – between the tangible and the intangible',* 2008.
1393 Machek, Vaclav, 'Origin Of The God Vishnu', *Archiv Orientalni* 28 (1), 1960, pp. 103 – 126.
1394 Quirke, Stephen *The Cult of Ra: Sun-Worship In Ancient Egypt*. London: Thames & Hudson, 2001.
1395 Payment, Simone *Greek Mythology*. New York: Rosen, 2006, p. 33.
1396 Pre-socratic philosophers
1397 Macdonald, James 'The Festival Of The Flayed God', *JSTOR Daily*, 2019 [Online]. Available at: https://daily.jstor.org/the-festival-of-the-flayed-god/ [Accessed 3rd December 2019].
1398 Apokryltaros *et al.* (*eds.),* 'Chaac', *Wikipedia*, 2019 [Online]. Available at: https://en.wikipedia.org/wiki/Chaac [Accessed 3rd December 2019].
1399 Bennett, Jane *Vibrant Matter: A Political Ecology Of Things* North Carolina: Duke University Press, 2010.
1400 Ryan on worlds – can 'reach out to them'
1401 Tilley, Christopher *Interpreting Landscapes.* London: Routledge, 2016, p. 26.
1402 Latour, Bruno, 2005.
1403 Byrne, Ruth, 2007, p.
1404 Kieckhefer, Richard 'The specific rationality of medieval magic'. *The American Historical Review* 99 (3), 1994, pp. 813 - 836

If landscapes, their denizens and their abstract processes are perceived, in some manner, as persons, they can be acted upon in ways that are appropriate to interpersonal relations; a suite of actions which human beings are intimately qualified to undertake. Such socialised actions have most often arisen in the form of ritual, magical practice and social ceremony: 'the performance of more or less invariant sequences of formal acts and utterances', designed to effect a certain end[140514061407]. Through ritual, humans could seek to drive off bad weather, plague or misfortune by bullying and intimidating the beings that represented those phenomena with shouting, flogging or material torture[14081409]. They could cajole and flatter the gods that controlled the availability of resources with gifts and sacrifices[1410], or by observing the proper rules of etiquette[1411]. Achieving esoteric, systemic change might require a psychopomp to travel to the god's realm directly, to bargain with them, or seek their advice[1412]. Again, often enough such social parlays seemed to have the desired effect: good harvests or subsiding epidemics standing as 'sign language'[1413] from the environmental persons responsible, as they advertised their pleasure (or displeasure). Internal consistency was strengthened, the narratives more resonant, and the rituals became more and more indispensible.

Debates persist as to whether the narrative frameworks, or their complementary ritual behaviours, arose separately, or were 'ambi-generative'[1414]; the two are clearly intertwined. Ritual and magic are, often, the outward manifestations of our narrative conceptions of places and processes as persons; a 'mode of enacting religious thought'[1415], serving as a 'semi-symbolic, semi-real'[1416] bridge between the 'cognised' and 'operational' environments in which humanity simultaneously live[1417]. Rituals allow

1405 Rappaport, Roy, 1999, p. 24.
1406 Horton, Robin 'A definition of religion and its uses'. *The Journal of the Royal Anthropological Institute of Great Britain and Ireland* 90 (2), 1960, pp. 201- 226.
1407 Bird-David, Nurit, 1999, p.
1408 Rochberg, Francesca 'Ina Lumun attali Sin: On Evil and Lunar Eclipses'. I*n:* Van Buylaere, Greta *et al.* (*eds.*) *Sources of Evil: Studies in Mesopotamian Exorcistic Lore*. Leiden: Brill, 2018, p. 303.
1409 cite
1410 Glob, Peter Vilhelm, 1969, p.
1411 Nasdasdy, Paul, 2007, p.
1412 Desjarlais, Robert 'Healing Through Images: The Magical Flight and Healing Geography of Nepali Shamans'. *Ethos* 17 (3), 1989, pp. 289 – 307.
1413 Alexander, Lily 'Fictional World-Building As Ritual, Drama, And Medium'. *In:* Wolf, Mark J. *(eds.*) *Revisiting Imaginary Worlds: A Subcreation Studies Anthology*. London: Routledge, 2017, pp. 14 – 45, p. 23.
1414 Ryan, Marie-Laure 'Ritual Studies and Narratology: What Can They Do For Each Other'. *In:* Nunning, Vera *et al.* (*eds.*) *Ritual and Narrative: Theoretical Explorations and Historical Case Studies*. Germany: De Gruyter, 2014, pp. 27 – 50.
1415 Layton, Robert, 1991, p.
1416 Alexander, Lily, 2017, p. 18.
1417 Rappaport, Roy, 1999, p. 19.

humans, on an autocosmic plane, to influence and manipulate the systems within which we are enmeshed; to shape the world to our benefit, according to a logical schema[1418].

While these conceptions, and these actions, are not directly 'correct', the active relationships with ecology that they encouraged, and the 'symbolic map[s] of reality'[1419] that they generated, were rarely directly harmful, and often beneficial, to early societies. They actively encouraged behaviours that were preservative of ecological health[1420142114221423142414425], and certainly helped to strengthen social bonds between their human participants. Such rituals and thought systems required mass cooperation and collective sustenance; they facilitated complex coordination, and harmony between disparate kinship groups[1426]. Their maintenance and practice became inextricable from a growing human municipality[1427], and 'the evolution and maintenance of human societies'[142814291430]. Many scholars track their coagulation into 'larger religious context[s]', their resonance ensuring[1431] that they would continue to manage fragile, unpredictable civic arrangements in the first villages, towns and cities of human history[1432]. A social relationship with the non-human, non-living world now kept humans alive and thriving in an environment that their own actions were gradually complicating; it helped to promote a 'regulatory hierarchy'[1433], manage resource use, enforce behavioural norms, galvanise invention and direct

1418 Frazer, James *The Golden Bough: A Study In Magic And Religion*. London: Macmillan Press, 1976, p.
1419 Kearn, Laurel and Keller, Catherine (*eds.*) *Ecospirit: Religions and Philosophies for the Earth.* New York: Fordham University Press, 2007, p. 629.
1420 Dennett, Daniel, 2013, p.
1421 O'Flaherty Wendy Doniger *Other People's Myths*. London: University of Chicago Press, 1995, pp.
1422 Shepard, Paul and Shepard, Florence, 1998, p.
1423 Gibson, James *A Reenchanted World*. New York: Henry Holt, 2009, p.
1424 Hornborg, Anne-Christine 'Protecting Earth? Rappaport's Vision of Rituals as Environmental Practices'. *Journal of Human Ecology* 23 (4), 2008. pp. 275 – 283.
1425 Hallowell, Alfred Irving *Ojibwa ontology, behavior and world view*. New York: Columbia University Press, 1960.
1426 Peoples, Hervey *et al.* 'Hunter-Gatherers and the Origins of Religion'. *Human Nature* 27 (1), 2016, pp. 261 – 282.
1427 McGivern, Ron 'Chapter 15. Religion', *Introduction To Sociology*, 2019 [Online]. Available at: https://opentextbc.ca/introductiontosociology/chapter/chapter-15-religion/ [Accessed 3rd December 2019].
1428 Rappaport, Roy, 1999, p.
1429 Morris, Desmond, 2013, p.
1430 Shils, Edward 'Centre and Periphery'. *In:* Shils, Edward *The Logic of Personal Knowledge.* London: Routledge, 1961, pp. 117 – 130.
1431 Boyer What makes anthropomorphism natural
1432 Durkheim, Emile *The Elementary Forms of the Religious Life*. New York: Dover, 2008, pg. 10.
1433 Hoey, Brian 'Striving for Unity: A Conversation with Roy Rappaport'. *Retrospectives: Work and Lives of Michigan Anthropologists* 16 (1), 2006 [Online]. Available at: https://quod.lib.umich.edu/cgi/t/text/text-idx?cc=mdia;c=mdia;c=mdiaarchive;idno=0522508.0016.104;rgn=main;view=text;xc=1;g=mdiag [Accessed 3rd December, 2006].

labour[1434][1435][1436]. From its humble, biological origins, the human 'intentional stance' has become one of the foundation stones of much subsequent culture: including politics, religion, and art[1437].

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It is at this point, at the birth of human history[1438] versus 'prehistory' as it is traditionally defined[1439], that humanity's imaginative relationship with its environment has always become subject to bold, summative proclamations; often, of sea change. Traditionally, such proclamations arose from what Rotenstreich calls 'the doctrine of historical progress'[1440]; a supposed chronological maturation in society from primitivism to civilisation, or, as Immanuel Kant called it, 'the progress of mankind toward improvement'[1441]. This 'whig historiography'[1442] is the basis for many of the schisms and dualisms that have defined classical discourse, as well as the 'modern' era[1443][1444][1445]. It is a doctrine that often broadly conceives humanity, in its dealings with the world, as moving from ignorance to education; from narrative, animist, naturalised naivety[1446] to artificial, monotheistic structures of 'belief'[1447][1448], where faith (or apostasy) are distinct states[1449][1450][1451] influenced by authoritarian control and education as to rigidly-defined notions of truth and falsehood, rather than an integrated, 'amphibious'[1452] social consensus incorporating both fact and fiction. I chose to situate `knole`'s counterfactual history in 18th century England precisely because of that period's pivotal position in this conception of human history. Anne's tumultuous two summers (1759 and 1760) sit along what has often been considered as a faultline, a 'significant

1434 Ryan, Marie-Laure, 2014, p. 37.
1435 Rappaport, Roy, 1999, p.
1436 Stepanek, Pat 'Review Of Ritual and Religion in The Making Of Humanity". *Alpha Lamda* 36 (1), 2006, pp. 102 – 108.
1437 SHUSTERMAN - "art emerged ina ncient times from myth, magic and religion"
1438 harari
1439 History vs. prehistory
1440 Rotenstreich, Nathan 'The Idea of Historical Progress and Its Assumptions'. *History and Theory* 10 (2), 1971, pp. 197 – 221.
1441 cite
1442 cite
1443 Cite 1
1444 Cite 2
1445 Enlightenment stanford philosophy
1446 Rosseau cite
1447 The Dialectic Of Enlightenment as a citation for the death of animism
1448 harari
1449 Cite 1
1450 Cite 2
1451 Cite 3
1452 Cite this from later.

historical break'[1453], in Western civilisation, imagination and environmental relations[1454]. The 'long 18th century'[1455] is conceived as a time when the 'iron cage'[1456] of rationalism, 'correlationism'[1457] and empiricism, fed by the discoveries and discourses of the previous century[1458] - Newtonian physics[1459], Cartesian dualism[14601461] – percolated into many aspects of Western culture, fundamentally 'enlightening'[1462] previously-imprecise conceptions of the universe[1463] and humanity's relationship to and within it.

Within Anne's lifetime, this optimistic, forward-thrusting age supposedly saw the fall of religion's star – at least the medievalist, distinctly Catholic, 'superstitious' beliefs of previous centuries[1464] – and in its place the rise of reason[1465], scientific enquiry, urbanisation, philosophical idealism[1466] and industrial progress as the key interfaces between humanity and nature. God went from a worldly, interventionist character to a Deist, 'mechanistic'[1467] concept[1468]. The mind and body were split[1469], and 'reality' and 'illusion' became compartmentalised[1470]. Art, traditionally lying under the editorial and social aegis of the Church[1471147214731474], and forming part of a spiritually-infused, practical everyday[14751476], became divorced into its own

1453 Disenchantment book
1454 Disenchantment 'sign of a rupture'.
1455 Davies, Owen and de Bleacourt, Willem, 2004.
1456 Saler again
1457 Mackay, Robin 'Editorial Introduction'. *Collapse* 2 (1), 2012, pp. 3- 14, p.4.
1458 What do we owe the enlightenment atlantic
1459 cite
1460 cite
1461 " the Enlightenment is conceived here as having its primary origin in the scientific revolution of the 16th and 17th centuries." sio the enlightenment continued this work, but with fewer strictures.
1462 cite
1463 Cite
1464 separation of art and religion tied to the Protestant/Catholic split (art and the church). magic and science book - demagicking is Protestant.
1465 Prospect the trouble with the enlightenment
1466 Stang, Nicholas. 'Kant's Transcendental Idealism', *Stanford Encyclopedia of Philosophy*, 2016 [Online]. Available at: https://plato.stanford.edu/entries/kant-transcendental-idealism/ [Accessed 3rd December 2017].
1467 What doe we owe the enlightenment atlantic
1468 Religion vs. Science guardian
1469 Citation for this
1470 Cite this (stanford)
1471 John Eisner "it is a cliche that most gree art (indeed most ancient art) was religious in function" - he courts this view.
1472 cite
1473 Cite 2
1474 "complex tripartite split between art, ritual and religion"
1475 Aesthetics stanford philosophy
1476 - "the elusive contrast between an aesthetic attitude and a practical one"

distinct 'breach'[1477][1478][1479][1480][1481][1482][1483][1484]. The mental and physical states produced provided a replacement for religious experience in the form of a new aesthetics: a 'disinterested'[1485], distanced and safely illusory imaginative playground[1486][1487][1488][1489][1490][1491][1492][1493][1494].

These seismic developments across the Western world have often been identified as the bedrock for more-specific changes in how humanity engaged with its environment. The oft-quoted anecdote of Voltaire patiently admonishing a terrified public (and a complicit Church) who blamed a volcanic eruption on God's anger perhaps most pithily demonstrates such changes[1495]. No longer are systemic natural phenomena the manifestation of a complex, unpredictable suite of beings - the 'sacred social imaginary'[1496] - but instead rational evidence of an 'enormous, soulless mechanism'[1497][1498][1499][1500]. Ritual, magical, socialised, embodied engagement with the world was replaced by intellectual, empirical enquiry, the scientific method and deterministic exploitation[1501][1502][1503]. The cognitive and perceptual structures to which the 'intentional stance' gave rise in

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1477 Victor Turner
1478 Cite 2
1479 Hampton, Alexander. 'Post-secular Nature and the New Nature Writing'. *Christianity and Literature* 67 (3), 2018.
1480 Dennett, Daniel, 2013, p.
1481 Ryan
1482 Morris, Desmond, 2013, p.
1483 For rappaport, religion is co-extensive with evolution.
1484 Wolf, Mark J. P, 2016, p. 17.
1485 disinterested
1486 vision of the soul chapter - art has gained a religiosity in the twentieth century. art has bifurcated from religion. Kant reconfigured old concepts of religion to be replaced by art.
1487 Grier, Michelle 'Kant's Critique of Metaphysics', *Stanford Encycliopedia of Philosophy,* 2018 [Online]. Available at: https://plato.stanford.edu/entries/kant-metaphysics/ [Accessed: 3rd December 2019].
1488 Coleridge, Samuel Taylor, 1997.
1489 Johnson, Samuel and Murphy, Arthur (*eds.*) *The Works Of Samuel Johnson*. London: Jones & Company, 1825, p.332.
1490 Shusterman - art has supplanted religion.
1491 'disinterestedness' "the concept of disinterestedness as the mark of such experience" - purging aesthetics of other 'interested' activities.
1492 before enviro aesthetics post-1970, "aesthetics within the analytic tradition was largely concerned with philosophy of art".
1493 'introduced into philosophical lexicon during 18th century'
1494 Imagination stanford
1495 What do we owe the enlightenment?
1496 Hampton, Alexander, 2018.
1497 Garrard, Greg *Ecocriticism*. London: Routledge, 2012, p. 69.
1498 Stone, Alison 'Adorno and the disenchantment of nature'. *Philosophy and Social Criticism* 32 (2), 2006, pp. 231 – 253.
1499 Bennett, Jane, 2010, p.
1500 in lorraine daston - traditional in 1600s we went from anthropomorphised world -> nonanthropomorphised world.
1501 Dennett, Daniel, 2013, p.
1502 Tally Jr., Robert *et al.* (*eds.*) *Ecocriticism And Geocriticism: Overlapping Territories in Environmental and Spatial Literary Studies.*
1503 Hitt, Christopher 'Ecocriticism and the Long 18th Century'. *College Literature* 31 (3), 2004, pp. 123 – 147.

humanity's distant past were set aside, past their use, even actively damaging. In their place, the safer environs of the artistic response arose, complementing a 'disenchant[ed]'[1504][1505], depersonalised world, with 'rational Man, not God, at its centre'[1506].

In her own, minor way, Anne Latch is a self-conscious standard bearer for this conception of the eighteenth century, in what she calls the 'coming Age'. In her writing, Anne cobbles together a rudimentary natural philosophy, combining her own endemic concerns of family, body and work with the fragments of Enlightenment thought to which she has been exposed. Her vision of an 'Enlightened' future is almost pathologically intense, sometimes too intense for her to even articulate. It is a time when humanity (and especially womankind) will be entirely divorced from the imprecision and contaminating, 'addling' uncertainty of the natural world: free of the 'foalish' beliefs of her contemporaries and instead indebted to the principles of the 'moderne' condition, as she sees it: 'industry', evidence, 'Troth', proper procedure, the segregation of Man and Nature, individualism, isolationism, mechanomorphism, cleanliness, tidiness and (of course) the importance of 'Viewing' things as they really are. The 'Newly Beest' that has come to live in the walls of her house is a vanguard of that Age coming, and evidence of its imminence: a denatured instrument, a denizen of a sterile world stripped of all its troublesome vitality and dangerous social milieu.

Of course, in mirroring this conception of the Age, Anne's position is subject to its weaknesses, as well as its strengths. In setting down her philosophies in print, she exposes their flaws and their inconsistencies. They are based on illiteracies, overreachings, misunderstandings; contaminations, both personal and ontological. The purist position on the Enlightenment, and the 'doctrine of historical progress' more generally, has

1504 Kim, Sung Ho 'Max Weber', *Stanford Encyclopedia of Philosophy*, 2017 [Online]. Available at: https://plato.stanford.edu/entries/weber/ [Accessed 3rd December 2019].
1505 Jenkins, Richard 'Disenchantment, Enchantment and Re-Enchantment'. *Max Weber Studies* 11 (1), 2000.
1506 The trouble with the enlightenment.

always been a troublesome one[1507][1508][1509][1510]; a simplistic dogma masking a much more complex, autocosmic truth in continuum, rather than rupture, with the past[1511][1512][1513]. In recent years, and across many disciplines, discourses have changed to reflect on the eighteenth century as an interesting fluctuation in the biological and cultural evolution of humankind[1514][1515]; one that modified, rather than stalled, human imaginative engagement with environment, and where the 'imprecise boundar[ies]'[1516] between fact and fiction, art and science, belief and scepticism, are rarely neatly delineated[1517][1518][1519][1520][1521][1522][1523][1524]. As Owen Davies states, 'reason has not ended our relationship with magic'[1525]: our autocosmic, narrative, socialised engagement with the world around us survived the predations of the Enlightenment changed, but intact.

* * * * *

Tracing this continuum of ritualised and interpersonal relationships with our environment requires a brief consideration of the foundations of Enlightenment rationality and the scientific revolution. The platform of 18th century thought rested on older 'natural philosophies' and 'high magic'[1526][1527][1528]: discourses that relied on a mixture of ancient

1507 Davies, Owen and de Bleacourt, Willem 'Introduction: beyond the witch trials.' *In:* Ibid. (*eds.*) *Beyond the Witch Trials: Witchcraft and Magic in Enlightenment Europe.* Manchester: Manchester University Press, 2004.
1508 Wilby, Emma. *Cunning-Folk and Familiar Spirits: Shamanistic Visionary Traditions in Early Modern British Witchcraft and Magic.*
1509 De Bleacourt, Willem "Evil People': A Late Eighteenth-Century Dutch Witch Doctor and His Clients'. *In:* Davies, Owen and de Bleacourt, Willem *(eds.*), 2004, pp. 144 – 166.
1510 " the interminable debate about the Age of Reason"
1511 "Classifying alternative worldviews as lower steps in a rigidly evolutionary schema helped to define (and exert) European superiority."
1512 "the ideological and geographical diversity of 18th century thought"
1513 "Generalising about intellectual movements is always a dangerous business"
1514 Stanford enlightenment article
1515 Disenchantment "a regulative ideal"
1516 Layton, Robert, 1991, p.
1517 Harvey, Graham 'Introduction'. *In:* Harvey, Graham (*eds.*) *Handbook of Contemporary Animism*. Oxon: Routledge, 2014, pp. 1 – 15, p.
1518 Price, Jennifer 'Review: *Landscape and Memory* by Simon Schama'. *Environmental History* 1 (4), 1996, pp. 77 – 79.
1519 Suddaby, Roy *et al.* 'Craft, magic and the re-enchantment of the world'. *European Management Journal* 35 (3), 2017, pp. 285 – 296, p.
1520 Morriss-Kay, Gilliam M., 2010.
1521 Layton, Robert, 1991, p.36.
1522 David Sorkin in the NYT - the Enlightenment and religion were not as split as we thought they were.
1523 In 'Chapel' chapter, the complex debates about the separations of art and religion - was happening earlier as well, a complex history rather than a conventional simple change.
1524 Art and religion encyclopedia.com
1525 Davies, Owen, 2009, p.
1526 Clark, 1999
1527 Davies again?
1528Independent article: " the settled days of the medieval consensus, which saw faith and the natural sciences as part of a cosmic whole"

scholarship[1529], Christian teaching[1530], contemporary definitions of 'reason'[1531] and the ritualised repetition of experimental acts[1532] to form a prototypical 'applied science' that existed throughout the medieval period and into the early modern[1533]. These traditions were complex and multifarious, riven by disagreements, counter-position and conceptual opposition[15341535]. However, together they represented a status quo which continued earlier, more explicitly religious (or 'protoreligious'[1536]) practices, combining them with Christian scholarship, classical survivals[153715381539] and technological advances to derive new understandings of the complexities of the universe.

Though the tools and terms had changed over the millennia, the methodologies had not: practitioners used their narrative faculties, rationalising imaginations and evolved, embodied sensibilities to 'scrutinise nature, to discern its patterns'[1540] and master the 'secret forces' governing its 'causal scheme'[154115421543154]. This work blurred contemporary boundaries between religion, magic and science[15451546]: Isaac Newton and Galileo Galilei, forefathers of the Enlightenment, were particularly promiscuous in their theses and practices[15471548]. For many the old 'intentional stance'[1549] still ruled, with complicated natural phenomena conceived not as mechanical processes, but as 'the incomprehensible yet present activity of... higher power[s]'[1550]. The pantheon responsible for such phenomena were, as always, constantly shifting: from witches to demons[15511552], spirits and

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1529 cite
1530 cite
1531 cite
1532 Magic and the rise of modern science lancet
1533 eward grant 1996
1534 "All the leading thinkers of the so-called Scientific Revolution in late 16th and 17th century turned away from the kind of study of nature that was being pursued in the universities, known as natural philosophy, and embraced an ei:npirical approach closer to that of the natural-magic tradition. "
1535 disencdhantment book pg. 56 - a confustion of beliefs about whether demons were real or false, illusions or agents.
1536 dennett
1537 Citation for this.
1538 Cite this.
1539 cite
1540 Mountains of the mind.
1541 cite
1542 Clark, 1999
1543 Davies grimoires
1544 Arcana mundi
1545 Riding and llewellyn
1546 Cite 2
1547 cite
1548 Cite 2
1549 Dennett again
1550 Davies
1551 Thinking With Demons, p.151
1552 Demons and illness in early modern - p.399

angels[1553], to God himself and the Devil: an environmental figure so present in early modern conceptions of the natural world that the French writer Charles Perrault called him 'the Great Naturalist'[15541555]. As in the distant past, natural philosophy sought to understand the world in dramatic, narrative, characterised terms, and manipulate it through forms of socialised interaction, even when that interaction was more obviously 'scientific': using new understandings and technologies to entreat, trap, avoid, observe and appease this cast of influential, invisible agents[155615571558]. While I can only risk a cursory history here, this fascinating line of research reveals not only that the birth of modern science marked a continnum with earlier, 'superstitious' engagements with the world, but that subsequently the Enlightenment itself – all that Anne cherished of reason, 'Troth', and detachment from the past – shared that same 'common epistemic basis'[1559], and much of its ritual, magical method[1560156115621563].

While these links and continuums are consistently becoming better-known, traditionally they have been downplayed, or overlooked in scholarship on the 18th century; or, more often, bifurcated along lines of class, education and demographic. As Owen Davies and Willem de Bleacourt highlight, conceptions of the Enlightenment often divide populations into a large, uneducated underclass and a rich, educated 'elite': the former persisting in superstitious beliefs and practices, and the latter nobly pursuing the rationalist agenda, and exasperated at the foolishness of their inferiors[156415651566]. From Anne's perspective we see these demographics firsthand. There are the representatives of the educated, moneyed rulers of the mills and cities: the kindly gentleman scholar Mr. Wainscote; the authoritarian Magistrate Wandley who presides over Sarah and Matthew's execution; the eponymous Elijah Knole, the particular and humanitarian mill owner with ideas of social reform and education for the poor. There are

1553 Owen davies grimoire
1554 perrault
1555 Another citation for the devil.
1556 Cite 1
1557 Cite 2
1558 Davies
1559 "Harrison demonstrates that science and religion come into being with a common epistemic basis"
1560 Magic and the origins of modern science lancet.
1561 https://www.newstatesman.com/culture/books/2016/01/magical-thinking-history-science-sorcery-and-spiritual
1562 Cahan, David, ed. (2003). From Natural Philosophy to the Sciences: Writing the History of Nineteenth-Century Science. Chicago: University of Chicago Press. ISBN 0226089282.
1563 Disenchantment of science
1564 Cite 1
1565 Cite 2
1566 Cite 3

also the millworkers, drovers and shepherds of the poor moorland communities, full of 'addled' beliefs and practices oriented towards the environment that Anne sees as having no place in her 'coming Age'. These beliefs and practices together form what has commonly been called 'low magic'[1567]: a 'world of popular belief and custom'[1568] informed by a ragtag of influences, from the vestiges of medieval religious and magical worldviews to both Christian and non-Christian belief structures[1569]. The high moorland on which Anne and her contemporaries live is a perfect petri dish for such imaginations: a suggestive and liminal realm[1570] resonant with the activities, and manifestations, of 'an whole Docket of... Spriggets'. To Anne's contemporaries, the moor, and its invisible systems, were controlled by the same shifting *dramatis personae* that has accompanied humanity throughout its evolution[15711572].

Though she rails against it, seeing herself instead as an emancipated, rationalist female figurehead in a Newtonian or Cartesian mold, Anne recognises that many of her paying clients instead see her as an exemplar of this older belief system, and the creature that lives within her house as another demon or 'Defil' to placate or threaten. There is a certain, rare defeatist tone in Anne's writing at this point; as if she understands the futility of resisting such ideas, and indeed the opportunity for exploiting them. Anne benefits from the role she assumes in her community, even if she believes it is a misrepresentative one: for this role was as vitally important, and powerful, in this culture as it was in previous eras. Such figures had many names[1573] – from 'white witch' to 'healer' to 'soilwarp', in Anne's local Yorkshire dialect – but most commonly were called 'cunning folk'[1574]. These individuals have been incredibly important figures in the European cultural milieu for centuries[1575]: individuals who, like the shamans, magicians or priestly castes of earlier cultures[1576], held the instrumental keys to a narrative, socialised conception of the world, providing storied, internally consistent and 'attractive solutions'[1577] to the

1567 Davies
1568 Hutton, 1999
1569 Davies on this
1570 Swamp dragon
1571 Wilby - Wilby noting a decline in fairy belief, but not other personification beliefs.
1572 Davies
1573 Davies
1574 Davies
1575 Davies
1576 wilby
1577 Clark, 1999

problems that everyday life brought. Through ritual and narrative, cunning folk sought to make the opaque systems of the world 'safer [and] less hostile'[1578] by engaging with ecosystems – social and natural – at a personified level[157915801581]. Through their practices they sought to to punish the supernatural beings that caused harm to ordinary people through environmental manipulation[1582]; vowed to placate unquiet spirits[1583]; used charms to protect houses from supernatural ingress[158415851]; to read natural signs as messages, or fortunes[1586]. Though Anne dismisses these beliefs, her own, supposedly detached practices betray their lineage. Through her misreading of Isaac Newton's *Principia Mathematica*[1587], given to her in paternalistic charity by her patron Mr. Wainscote, Anne's conception of the world is no less personified. While it is not demons or spirits, or even God, who manipulates the lives of mortals in her 'View', it is instead the anthropomorphised 'Forse' of 'GRAVITAS': not a mechanical, disembodied physical phenomenon as Newton intended it, but a being as full of caprice and agency as any god or 'spyrit'. Anne's rituals and 'receipts', performed mostly on her 'Beest', have the trappings of a mechanistic, detached rationalism: but one can see that they are just as oriented towards socialised manipulation, in their own way, as any practice of 'low magic'.

Anne's dismissal of her contemporaries' 'addled' belief in the power of supernatural beings represents a common thread of Enlightenment thought: the 'naivety' of religious faith, and its delusional stranglehold on those lacking the education, or the self-critique, to escape it[158815891590]. This position, which has dominated discussions of the nature of belief for decades (if not centuries)[15911592], is being complicated and critiqued by an evolving interdisciplinary effort. It is becoming clear that human beings, whether 'primitive' or 'modern', educated or not, exist in a far more

1578 Wilson, 2016
1579 quote
1580 “Magic was essentially a way of dealing with all sorts of problems in life” (Arcana Mundi)
1581 Harding
1582 cite
1583 cite
1584 Hoggard, 2016
1585 Davies, 2009
1586 cite
1587 cite
1588 Cite 1
1589 Cite 2
1590 Cite 3
1591 Cite 1
1592 Cite 2

'amphibious'[1593] epistemological state towards their beliefs about the world, with strict delineation between 'belief', 'knowledge' and 'imagination' beginning to appear reductive or unhelpful[159415951596], and often guided by prejudices and agendas beyond the purely descriptive[159715981599].

In 18th century England, 'cunning folk' worked in an imaginative landscape that was ultimately contingent – neither fully distanced nor fully believed, but relying upon a complex social world that contained both believers and non-believers, charlatans and visionaries[160016011602]. Such historical evidence is corroborated by the work of many contemporary scholars, who have charted how religious and superstitious belief is rarely, if ever, watertight: instead, across human history it has been subject to constant 'tactical improvisation [and] opportunist reinvention'[1603] within populaces[160416051606], based on a fragile 'social consensus'[160716081609] in 'particular cultural settings'[16101611] that can be 'reflective[ly]'[1612] and critically judged by those who practice it, as well as continually incorporating new ideas, imaginings and information as time passes[1613]. What is most important is that such practices continue to have a 'psychosomatic' utility[16141615161616617] for the society that engages in them[16181619162016621]. As research advances, it will become increasingly difficult to draw distinctions between art, religion and science as distinct forms of human imaginative

1593 Bailey
1594 Sugarman et al, 2011 'belief in ghosts and astrology'
1595 Vamos, 2010
1596 Boardman and Sonnenberg, 2014
1597 harari
1598 Aeon enlightenment disenchantment
1599 Myth of disenchantment
1600 Cunning folk book.
1601 Clark
1602 Smith
1603 LRB
1604 Groenveld
1605 Plate, 2010
1606 Desmond Morris pg. 8
1607 Arcana mundi
1608 Harvey "how does the activity called 'believing manifest itself?"
1609 Latour 2010
1610 Arcana mundi
1611 rappaport
1612 LRB
1613 "the vast majority of the nation's Christians who have been taught since the time of St Augustine, who died AD430, that where there appears to be a conflict between demonstrated knowledge and a literal reading of the bible then the scriptures should be interpreted metaphorically."
1614 Keinan
1615 Norton
1616 Norton and Gino
1617 Vamos
1618 Ryan talks about the difference between believing in rituals and 'just going through the motions'.
1619 LRB article
1620 Harari's imagined orders
1621 Tamar Gendler 2008

engagement with the world[1622162316241625162616271628162916301631 1632]: instead, an autocosmic 'continuum'[1633], transcending matters of class, subjunction or education, will become a more mature model for understanding both historical and contemporary evidence.

Considering the supposed 'elites' [1634] of 18th century England, and their own detached, informed, 'moderne' practices towards their environment, scholarship reveals the weaknesses of a narrative that stresses strict delineations between reason and fancy, imagination and knowledge, or the personified and the lifeless. As Anne's client list reveals (and as contemporary and scholarly sources corroborate[1635]) 'cunning folk' and other practitioners of popular belief could count many of the supposedly 'educated' classes amongst their clientele[1636 1637]. Even amongst those who did not frequent healers or soothsayers, Christian faith remained strong, adapted to be compatible with the new scientific method[1638 1639]. However, even the popular, Newtonian Deist position, which framed God as a detached designer without day-to-day involvement in the running of the world[1640], still had not resolved the problem of 'first causes', or (to put it more appropriately) 'first intentions': despite his distance from worldly affairs, God was still a deliberating, personified agent. What is more, many educated individuals actively rejected the Deist position, adopting more 'revelatory'[1641], 'theosophical and spiritualist'[1642] positions that preserved active, socialised engagement with the environment's perceived populations. These beliefs – which stressed the presence of agency in environmental phenomena – were paradoxically paired with scientific discoveries (particularly in microbiology and ethology) that strained

1622 Layton
1623 Finnish folklore paper.
1624 Mellman, 2012
1625 Morriss-Kay, Gilliam M., 2010.
1626 Boyer, 2013
1627 Hitt, Christopher 'Ecocriticism and the Long
1628 Boas in Layton Chapter 2
1629 Northrop frye
1630 Campbell
1631 References from 1
1632 Serge margel
1633 Stanford imagination
1634 Wilby again
1635 cite
1636 Cite 1
1637 Cite 2
1638 Cite 1
1639 Cite 2
1640 Deist citation
1641 citation
1642 The myth of disenchantment

simplistic conceptions of a mechanistic, lifeless natural world beyond the human scale[1643][1644][1645]. Religion and science continued to intertwine as the cutting edge of human ingenuity studied new 'punctualisations' of the world around it.

In the arts, which had supposedly co-opted emotive and cognitive responses towards nature that had once belonged to religious practice into a new, 'disinterested' sandbox[1646], further complications arise. Anne herself is forced to confront these complications in the form of Elijah Knole: a man that had, previously, exemplified sober Enlightenment values of rationality and industry, but who is reduced to his own form of 'addling' in the face of nature's power. The image of Knole and his 'elite' companions stood huddled, shivering on the moortop awaiting a glimpse of the 'dignif[ied], incorruptible' cowherd Simon Awlbatch, a 'spyrit' of the moor in his own right, stands as a symbol of how aesthetic practices towards environment in the 18th century were anything but 'disinterested', depersonalised, or distanced[1647]. The Enlightenment trifecta of the picturesque[1648], the sublime and the beautiful[1649][1650] were aesthetic positions towards the world that failed to maintain their distance from older practices[1651]. From the continuing personification of nature along female or feminine parameters, in order to justify continued exploitation of its resources[1652][1653]: to burgeoning tourism industries, that provided ritualised 'engagement[s] with landscape'[1654] that were frequently framed in characterful narratives of communion or adversity ith natural forms[1655][1656][1657][1658]; from the dualism of humanity and nature charted by the sublime, and the imaginative relationship between the two that challenged

1643 Cite 1
1644 Cite 2
1645 Cite 3 (Heinz Kimmerle, animism in the sciences)
1646 History of aesthetics.
1647 History of aesthetics stanford
1648 Picturesque 18th Century Debate
1649 Beautiful,Sublime,Picturesque Review
1650 Gilpin originally
1651 Townsend 1997
1652 Emma curran paper
1653 Diderot
1654"On the simplest level, a sublime experience while crossing the Alps is an engagement with landscape"
1655 Mountains of the mind
1656 Flaneur reference
1657 Literature, science and exploration in the romantic era (paper for citation)
1658 Mountains of the mind.

human triumphalism[1659] and agency[16601661] in ways both similar and different to earlier religious beliefs[166216631664]; to the Romanticism and subsequent counter-rational movements that appeared in subsequent decades[16651666166716681669]; the belief that the arts lay in some 'improved' territory beyond action, beyond personification, beyond the everyday 'real', seems now woefully simplistic[1670].

* * * * *

Anne Latch never lived to see the rationalist, denatured and decharacterised utopia that she felt sure was fast approaching; as the (relatively) short review above demonstrates, it is arguable whether it ever did arrive. The idea that the Enlightenent 'disenchanted' nature and the human imagination, and provoked a 'religious-secular dichotomy'[1671], is provably oversimplistic[1672]: the intellectual movements of this period were a 'diverse phenomenon'[1673] that represented fluctuations in a continuous spectrum of the 'psychic claims that human beings have made on nature'[1674].

For many modern critics, the Enlightenment represents less of an abnegation of the trappings of socialised, environmental interaction, and more of a reinvigoration of individual imagination and critical thought in regard to it[1675]. Such critiques led to an even more diverse range of subsequent artistic, philosophical and social trends, in constant, roiling discourse with each other, that continue to mutate their way across the early twenty-first century – from the 'Counter-Enlightenment' of

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1659 Nayar
1660 cite
1661 Majorie Hope Nicolson 'Mountain Glory'
1662 Hitt again
1663 Natural sublime and feminine sublime
1664 Sublime as religious experience.
1665 ". In overturning the aesthetic dogmatism of the seventeenth century, the eighteenth-century cult of the picturesque helped prepare the way for the aesthetic liberation of the romantic era"
1666 Ruskin 1897, 3: 161-77
1667 cite
1668 Peter conrad split religion - "the transposition of Christian ways of thinking into secular termst hat is such a prominent feature of the modern period"
1669 Why the enlightnement was not the age of reason
1670 'this fact prompts the question whether... the concept of the aesthetic is inherently problematic and it is only recently that we have managed to see that it is.
1671 Sorkin nyt
1672 Aeon disenchantment essay
1673 Why the enlightenment was not an age of reason
1674 cite
1675 Who said this?

Romanticism to Horkheimer and Adorno's vision of modernism in the early twentieth century[1676][1677]. Like those (and other) critical movements, the current 'post-classical', postmodern milieu owes much to the Enlightenment, and what came both before and after it[1678]. Below is a short list of some contemporary discourse which honours this fundamentally autocosmic conception of the human imagination, and its relationship with the spaces it inhabits: relationships that resonate with active, personified force.

- The prevalance of modern, 'new'[1679] or 'critical'[1680] modes of anthropomorphism and animism across a variety of disciplines[1681][1682][1683]. These are often proffered as a scientifically valid[1684] way of taking an interpersonal, political, 'relational, embodied, eco-activist'[1685] stance towards the environment, that challenges the '*a priori* assumptions' of classical science[1686], and helps 'people [to] negotiate [the] everyday needs'[1687] that have historically been fulfilled by animism, while maintaining critical rigour[1688][1689][1690].
- The ever-growing prevalance of non-human (and even non-organic[1691]) narrators and characters in fictional narratives, in part a manifestation in the ever-increasing academic interest in the emotions, personalities and life-experiences of non-human

1676 Enlightnement stanford
1677 The trouble with the enlightenment
1678 cite
1679 Graham harvey introduction
1680 Critical and naive modes of anthropomorphism
1681 Jos Smith - (Jos Smith) - "mind – just as with Leach's ascription of reflective consciousness to animals and plants, or Dee's self-questioning wildebeest and knowledgeable gas – is understood to be spread out everywhere in nature, rather than a possession only of human beings.
1682 Giraldo herrera – microbiology animism
1683 Microanimism website
1684 Nadasdy
1685 Who?
1686 Povinellio 1995
1687 Tylor
1688 Animism in the sciences then and now
1689 Berenguer, 2007
1690 Saving mr nature
1691 Herman

animals[1692169316941695169616971698169917001701702]. This 'post-Darwinian' body of work draws on postmodernist philosophy[170317041705], notably distinct from previous Cartesian[1706] or Hobbesian[1707] depictions of animals as machines, allegories[1708] or human ciphers[1709]; framing them instead as autonomous, sentient agents in their own right[1710171117112] with whom we engage in narrativised, 'trans-species entanglements'[1713].

- The rise of 'environmental personhood' as a legal precedent, intermingling traditional religious belief with modern environmentalist legislation[171417151716].
- The persistent ascent of psychogeography[1717], nature writing[1718], econarratology[1719], the 'literature of place'[1720] and their neighbouring genres as exemplars of a politicised[1721] 'post-secular' narrative practice[1722]; an 'ecologically informed aestheticised observation'[1723] that draws equally on the imaginative and epistemological furniture

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1692 "anthropocentric ontologies deny proper selfhood to nonhuman beings"
1693 this other way of configuring creatural life allocates to a whole range of animals possibilities for selfhood that more restrictive ontologies limit to humans—or even to only a subset of the larger human population."
1694 Derrida
1695 Sober, 2005
1696 plumwood
1697 Sanders 1995
1698 Robinson Mikmaq
1699 Aaltola
1700 Nicola Taylor
1701 Never an it
1702 Eleanor sandry article
1703 Derrida
1704 Baudrillard
1705 Object network theory
1706 Descarte on animals
1707 Hobbes on 'artificial animal'
1708 DeMello
1709 “Immense symbolic responsibility” derrida
1710 " the conceptual integration of human and non-human traits"
1711 Storyworld/Umwelt: Nonhuman Experiences in Graphic Narratives

1712 Derrinoteda “An existence that refuses to be conceptualized”
1713 cite
1714 Gwendolyn Gordon
1715 Ohlin Miqmaq paper
1716 Personhood and neuroscience.
1717 flanagan
1718 Nature writing
1719 carraciolo
1720The “literature of place” - “proliferation of landscape writing in Britain and Ireland” is both stylistically innovative and mindful of ecology and conservation practice - against homogenisation - the “character” of place.

1721 Characters are relating to space all the time, but new nature writing mirrors the concerns of academic ecocriticism, which has similarly explored how scientific and cultural understandings of nature have created hierarchical distinctions between the human and non-human through metaphors of empirical mastery or romantic rapture, but which also acknowledges that such myths are, in Jonathan Bate’s words, ‘necessary imaginings, exemplary stories which help our species to make sense of its place in the world’.
1722 Hampton - A post-secular reconceptualisation of our relationship to nature”
1723 Who said this?

of religion, science and fiction[1724][1725][1726][1727] alike, while defining itself as none of these entirely. It is a class of narrative that often uses the framework of the personal encounter with place to demonstrate a 'dialogic relationship' between 'the natural and social worlds'[1728] - between animals and humans[1729][1730], between place and person[1731][1732], or between observer and system[1733] - as an ongoing social, interactive arrangement. They explicitly rekindle the role of narrative as, primarily, a ritualised, personified engagement with place; a 'psychotherapy [or] psychodrama'[1734] involving 'a rather larger than usual cast of characters'[1735].

- The sophistication of fictional world studies in literary theory[1736][1737][1738], grounded in possible world theory and reorienting scholarly attention on 'imaginary worlds'[1739] as perdurant, 'ontologically complete'[1740] and systematic 'transmedia entities';[1741] individuals worthy of 'interest in themselves'[1742] alongside the persons that inhabit them[1743][1744][1745][1746]. For many, the importance of imaginary worlds can be taken further: they become the most important entities *within* a text, agents in their own right, enacting plot[1747] and manipulating the doings of characters[1748] who regress to become mere 'functions of landscape'[1749]. This

1724 From new nature writing essay: "deploying techniques drawn from novelistic discourse in their treatment of nonfictional material."
1725 Gross 2018
1726 Gibson Gibson - "re-sacralizing animals"
1727 cite
1728 Owain jones conception of the rural
1729 H Is For Hawk
1730 The PEregrine
1731 Cite
1732 Mountains Of The Mind
1733 Nan Shepherd
1734 Oakley thesis
1735 mabey
1736 Mark j. wolf
1737 Ryan
1738 Celia Pearce on LOTR
1739 Building imaginary worlds review.
1740 Routledge encyclopedia of narrative theory possible worlds
1741 "our present fascination with imaginary worlds has deep roots in human evolution"
'at the intersection of agents and situations scattered across time and space'(Hones 2008: 1307, 1302).
1742 Mark J. Wolf book
1743 Lawrence Durrell - "You write... as if the landscape were more important than the characters'.
1744 Broadly speaking, narrative tends to place human characters in the agentive position, while nonhuman realities (including nonhuman animals and natural landscapes or processes) are relegated to the position of objects: tools to further human ends, or a backdrop to human-centered events.
1745 Handbook of narratology space
1746 Fludernik 1996 'anthropomorphic bias'
1747 Lotman 1970
1748 "Lotman views the world of a story as structured by a system of relations between symbolic domains delimited by spatial boundaries."
1749 Caracciolo

econarratological[1750][1751] perspective privileges the environments of fiction as the prime 'produce[rs of]... symbolic and emotional meaning [and]... direct[ors of] patterns of reader engagement'[1752], relying on our evolved architectures of embodied cognition[1753][1754].

- The rise of climate literature and the 'literature of the Anthropocene'[1755][1756], serving both as aesthetic response to climate change and as a 'persuasive resource' for political action[1757]. Such work encourages active engagement with environment at a variety of 'punctualisations', both towards animals, ecosystems and the planet as a whole[1758][1759].
- The interdisciplinary turn toward the 'post-human' and the 'post-humanist'[1760][1761][1762][1763][1764]; a diffuse project which deprioritises classical humano-centric ontologies of knowledge into 'flat'[1765] ontologies incorporating the more-than-human world. In its more extreme form, it seeks to dissolve the human being as a subject entirely, redrawing the boundaries of subjecthood to instead focus upon the 'network of connections... with all forms of life'[1766].
- The sophistication and diversity of thought around landscape and environment interpretation and preservation in the heritage sector[1767], particularly in the fields of phenomenological archaeology[1768], virtual heritage[1769] and affective heritage interpretation[1770][1771][1772].

1750 Erin James (2015)
1751 Alexa Weik von Mossner (2017)
1752 Certeau 1984
1753 caracciolo
1754 The beenfits of bringing cognitive sciences into ecocriticism
1755 Eco and geo book
1756 Caracciolo
1757 Gross, 2018 CogSci in EcoCrit: emotions created to promote political and social change, environmental texts exert a deep and effective impact on their readers. .
1758 " specific entities such as animals and seas are core in people's mental images of nature (e.g., van den Born,Lenders, de Groot, & Huijsman, 2001)".
1759 Gaia
1760 The 'non-human' turn
1761 Alien phenomonology
1762 latour
1763 Deleuze and guattari
1764 Cary Wolfe 2010
1765 Alien phenomenology
1766 Nayar, 2014
1767 Kryder-Reid
1768 Tilley
1769 Erik Champion Champion - "A visitor perceives space as place, and inhabits (modifies the place)"
1770 Moscardo
1771 Schakley 1996
1772 "The artifacts act like a library of memory cues to remind people how to behave according to certainevents or locations, (Johnson 1997, Crang 1998, Relph 1986).

Reaching the present day in this overview of humanity's imaginative engagement with space and place, there is much to critique in my approach. The examples I have used are necessarily selective, drawn from the specialisms that have influenced my project. They skirt over some of the complexities of 18th century thought, particularly in relation to differences in the conception of empiricism versus idealism, such as in Hume and Kant[1773]; this is something I would like explore more in future theoretical work. For a review of *human* imaginative response, I am overly focussed on Western discourses[1774][1775]; there are many other examples, from around the world, that could perhaps have taken their place. Lastly, finding a point to stop my analysis is difficult. New and interesting developments appear almost every day in the media: the public reaction to the burning of Notre Dame in 2019, for example, has many intriguing features salient to the autocosmic scholar[1776].

What this cursory, longitudinal survey demonstrates, however, in the context of this thesis, is the continuous, undulating qualities of humanity's imaginative engagement with the environments in which it lives, dreams and thinks. Patterns emerge which complicate the 'myths'[1777] of progressive despiritualisation, of the depopulation and decharacterisation of our lived environments; of the separation of the real and the fictional, the believed and the known, into strict and tidy denominations. Instead, we see cycles, suppressions and reawakenings[1778], again and again: scientific modernity is 'reconcile[d]... with a certain protomodernity'[1779], an emergent 'synergy'[1780] between rationalism and irrationalism. From biological 'first principles' to the latest manifestations of long-relevant cultural movements[1781], it seems clear that humanity's engagement with places has always been, in some manner, autocosmic, resonant, systemically interactive and (in some manner) interpersonal. This relationship has always overwhelmed any

1773 Cite this
1774 Peters
1775 caracciolo
1776 cite
1777 Myth of disenchantment
1778 Disenchantment ENCOURAGES enchantment.
1779 Westphal
1780 Calls 2nd half of 20th century a "synergy" between religion and sceince. - room for a 'God of the gaps'.
1781 Harvey "cognitive mechanisms arising in the deep evolutionary past but continuing to affect contemporary behaviours"

simple categorisation concerning truth-status[17821783], social function[17841785178617861787], or 'simplistic[,] deterministic'[1788] prescriptions of belief or non-belief. It is an inescapable, synchretic suite of narrative experiences and actions that oscillate between fact and fiction, the everyday and the sacred, bodily and intellectual, aesthetic and non-aesthetic. They are experiences which draw on a powerful evolutionary impulse to 'nominalise'[1789] and characterise the complex, unpredictable and seemingly 'living' systems of the world, of any world; to build and tell stories about them, and to use those stories in a vast array of practical applications.

In part, this section has simply served to bolster my conception of the autocosmic, as it was delineated in Chapter 1, across one, specific realm of human existence. However, it also points the way to something more practical. The autocosmic depth and breadth of humanity's engagement with environments, both within the arts and without, can serve a methodological purpose. In Project `knole`, I have used this spectrum of human experience, and cultural output, to find new opportunities for approaching artistic challenges: in particular, the challenge of developing resonant computational characters. As the next section explores, examples of human encounters with a systemic, environmental personhood prove to be surprisingly useful launchpads for marrying the systemic and the personal in comp-art as well: creating a methodology freed from the strictures of purely aesthetic precedent.

1782 Kapogiannis
1783 Ryan on ritual (semi real)
1784 "crossing the boundaries between arts, humanities and sciences".
1785 Gaskill, 2017
1786 Inner Lives
1787 "the institutions of religion never fully disappear but, rather, are simply temporarily suppressed by the sediment of alternative myths until new social circumstances allow them to re-emerge."
1788 Gaskill, 2017
1789 Nominalization - turning verbs into nouns - processes into agents.

Section 3.3: Computational Spaces, & Character-As-Environment

Given the overwhelming importance of environmental engagement to the human animal, it is unsurprising that our development of the computational paradigm has been inextricably spatial. It is beyond the scope of this thesis to determine whether this quality is intrinsic to the form, at the conceptual level, or whether it is merely humanity's best framework for manipulating information, because of our evolved and enculturated sensibilities[1790]. Answering such a question would require a deeper analysis of mathematics[1791], cybernetics[1792] and systems theory[1793], amongst other disciplines. It is enough to state that, as Lev Manovich has it in *The Language of New Media*, that the history of computation in the twentieth and twenty-first centuries - from electromechanical to digital form, from military to civilian application[1794] - has seen 'navigable space' become a 'cultural form in its own right... a new tool of labor... [and] a common way to visualize and work with any data'.[1795]

Today, it is almost unimaginable that computation could be anything other than spatially conceived. The language and mechanics of computing are riddled with dimensional terms and concepts: the 'network' of the Internet and its related concept of the hypertext, flowing between hypothetical and geographical space[1796][1797]; the 'architectures' of AI systems, and the programmers and engineers who stand as 'architects' of these intermeshed physical and virtual topologies[1798][1799][1800]; the manner in which users, in cybernetic feedback with the machine, 'navigate' and 'search' their way through environments composed of information[1801][1802][1803][1804]. The shibboleth of the spatial shows no signs of abatement as the development of the computational continues[1805]. Computers remain, primarily, a tool for the

1790 Manovich p.823
1791 Cite
1792 Citation for this.
1793 cite
1794 Manovich again
1795 manovich
1796 As Wertheim argues: “Despite its lack of physicality, cyberspace is a real place. I am there—whatever this statement may ultimately turn out to mean” (2000, 229; italics in original).
1797 Citation for this
1798 cite
1799 Koenitz in IDN for chnange talking about the history of calling designers 'architects'.
1800 Who else says this?
1801 Vance Byrd review "how spatial metaphors help us imagine how information is organized and how we gain access to it through hypertexts, in "windows," and "cyberspace.""
1802 Cite 1
1803 Cite 2
1804 Cite 3
1805 Something from John hopkins.

construction of environments of information, from the representation of the relationships within 'abstract information spaces'[1806] and systems[1807], to the simulation of 'physical spaces' directly: both real and fictional[18081809181018111812].

It is in computational art, particularly narrative comp-art, that the systemic, interactive simulation of spaces, of worlds and environments, finds its most natural home: where the primacy of space in the computational, and in narrative, are best-suited to interpenetrate[1813]. In videogames we interact with 'simulated, rule-governed worlds' [1814]18151816 as 'graphic realms' of a particular narrativity[181718181819182018211822182318241824]. In interactive fiction, text becomes a spatial mechanism, a simulated world[1825], to be navigated as a topography of 'twisty little passages'[1826] representing a gamut of human experiences[18271828]. Real and virtual spaces are entwined and interpolated in MR and XR artwork[1829183018311831], the traversal between them, and the manipulation of each, a key driver of a still-emerging form of storytelling. In virtual and digital heritage interpretation, we undertake 'virtual travel'[1832] to preserved or long-gone cultural spaces, in order to understand them in manners different from the study of relics or the

1806 Manovich again
1807 Cite from john hopkins (database)
1808 Manovich - "computer technology privileges spatial dimensions"
1809 'spatial analogy' of donald norman
1810 Ryan
1811 Nitsche
1812 Who said this?
1813 Ryan on worlds and space.
1814 Ryan, 2001
1815 Ariosto piece ryan
1816 Havot & Wesp - “virtual world geographies”,
1817 Gazzard, 2011
1818 The future of tourism
1819 Newman, 2004 - “Typically, videogames create ‘worlds’, ‘lands’ or ‘environments’ for players to explore, traverse, conquer, and even dynamically manipulate and transform…” (Newman, 2004, p.108)
1820 "Collisions, spatial rela- tions of bodies to each other, audiovisual representations of the environment, interaction with objects in the world and with the world itself—all necessarily highlight the spatial qualities of the game." - videogame spaces.
1821 “the gameworld functions as a meaningful place” (Miller)
1822 "The history of videogames reveals an almost linear trajectory of increasingly rich and integrated ecologies of gameworlds."
1823 Henry JenkinsHenry Jenkins - "game designers don't simply tell stories: they design worlds and sculpt spaces."
1824 "machines for generating compelling spaces".
1825 IF as nick montfort
1826cite
1827 Montfort Twisty Little Passages
1828 IF representing minds
1829 Cite 1
1830 Cite 2
1831 Naigation stuff from benford.
1832 Playing the past.

reading of texts[1833][1834][1835][1836]. In each case, the architects of these ‘procedural, participatory, spatial and encyclopedic'[1837] worlds, 'ripe with narrative possibility'[1838], deliberately use their audience's evolved and enculturated capacity for environmental engagement as a driver of resonance. Ancient (and not so ancient) 'reservoirs of emotional, intellectual and physical experience'[1839] with place provide the foundations for narrative 'involvement'[1840][1841][1842][1843][1844][1845][1846][1847][1848][1849].

It is not hyperbole to state that, since the form's earliest years, the representation of functional, interactive space has proven to be the most successful form of resonant narrative expression in comp-art[1850][1851][1852][1853][1854]. Much of what is termed 'narrative design' in the field is, at its best, a form of environment design[1855][1856][1857][1858][1859]: in which practitioners transform topography and ecologies into what Henry Jenkins calls a ‘narrative architecture’[1860].

Fifteen years ago, Jenkins identified four main ways in which environmental design in comp-art facilitated resonant narrative experiences: fifteen years later, his taxonomy of 'evocation, embeddedness,

1833 Champion 1
1834 “ indexical storytelling ” (Fernández-Vara 2011)
1835 LaMotta, 2012)
1836 Shawn graham
1837 murray
1838 Jenkins
1839 Haptic landscape.
1840 calleja
1841 calleja
1842 Mark J. Wolf (or other Wolf?)
1843 Manovich
1844 n Na Pali - Game 'environments' are not necessarily the encoded environments - code and assets - but the EXPERIENCED spaces.
1845 “Game designers routinely theme game spaces… to provide players with a mental attitude well-honed in the real world”
1846 "In a game we continually inhabit the present, trying to make sense of ourselves and our positions in space.
1847 “manifest the haptic qualities of the landscape” - “the player-game connection is not simple mimesis, but mental and physical investment as intention and action are directed towards the game world."
" the interactive process of virtual navigation mirrors active participation in the real world"
1848 Miller
1849 Bogdanovych
1850 Smith and worch
1851 Nitsche, 2008
1852 Calleja paper - "The spatial structures of games have an important influence on the structure of the narrative."
1853The need for a “great world” (Strik).
1854 "The immersive quality of these games lies as much in the responsiveness of their world as in the pursuit of the game goals."
1855 Marie laure ryan on game spaces.
1856 One more citation
1857 Games designers stick to genres that most invested in world-building and spatial storytelling (Jenkins).
1858 M barton 2008
1859 Vara indexical storytelling.
1860 Jenkins

enactment and evocation' still stands[1861]. The plotting in videogames and interactive fiction often remains wedded to the topology of the gameworld: the landscapes and environmental systems providing the narrative framework for Campbellian quests or murder mysteries[18621863186418651866 1867]. 'Environmental storytelling'[1868] remains firmly in vogue, by which narrative information is embedded into an (often-depopulated[1869]) environment in order to create an interactive structure of 'epistemological discovery' and investigation[18701871187218731874187518761877187818791880 1881]. The navigation of systemic space is sometimes used more metaphorically, an interactive allegory for other, more complex phenomena[18821883188418851886188718881889 18901891]. When the 'simulation model' is more complex[1892 1893], dynamic and less-rigidly controlled, practitioners allow the simulation to generate narrative scenarios emergently from the simulated environment[18941895189618971898189919001901].

1861 Jenkins again.
1862 Ryan on this.
1863 "Space creates narrative in all senses" (Zimmerman & Salen)
1864 Montfort twisty passages.
1865 Tightening the world-plot interface.
1866 Manovich navigable space.
1867 Na pali "slow unveiling of the world"
1868 cite
1869 Cite bogost
1870 costikyan
1871 Smith and worch
1872 Vara again
1873 champion
1874 One other for digital interp.
1875 Minecraft great fire of london
1876 Rose theatre
1877 Tavinor
1878 Videogames are better without stories.
1879 Miller 2008
1880 Biederman and Vessel in Bateman 2014
1881 The girl in the bell tower.
1882 My boyfriend came back from the war
1883 navigable space... accomplishes the same effects that before were created by literary and cinematic narrative'
1884 Talks about Calkins character as a psychological maze - different rooms for different moods
1885 Curtain
1886 The binding of isaac
1887 La maison sensible
1888 Dear Esther
1889 " a projection of the narrator's trauma onto a landscape"
1890 The image of a game space.
1891 "architecture substitutes for psychology."
1892 The Virtual Ecology Of Game Environments
1893 The conversation
1894 bogost
1895 Accidental carjack
1896 Youngblood
1897 mateas
1898 Red dead
1899 alien
1900 the alien - "perhaps the mosst remarkable NPC I have ever encountered in a videogame."
1901 M Barton

In my gameplay study (see Appendix 2), this inextricable link between environment and narrative in comp-art was plain to see in my participants' play, and their comments on their own play. Their attention, their actions, their emotions and their cognition was captivated by the worlds they found themselves in: most of their strategy, curiosity and narrative engagement co-opted into the navigation and manipulation of worlds both fantastical and familiar. After playing *Everybody's Gone To The Rapture*[1902], one player struggled to remember any of the (deliberately) insubstantial characters he had encountered, or their stories: it was the village, the winding network of hedgerows, the empty houses and discarded objects that the characters that had left behind, that most captivated him. Another participant, making his way through the 'beautifully-realised', misty hills of *The Elder Scrolls V: Skyrim*[1903], crystallised this bias. To him, his narrative experience was *with* the environment, rather than any other element within it: in its systemic complexity, representational wealth and its reactive stance towards the player, it was the most important element of that experience, beyond the characters or plotlines vying for his attention. The province of Skyrim became the 'principal actor'[1904] of the game's drama: an environmental entity that 'demands our attention', that impels us to interact, to 'know… intimately', with far more persuasiveness than any other entity within it[1905][1906].

The reasons for the prevalence of environments that balance narrative resonance and computation in this manner, as opposed to other narrative elements (such as characters or plot) which do the same thing, are manifold. They are perhaps impossible to fully delineate: but for an artist seeking a methodology, it would be best to focus on practical issues. If (as Chapter 2 supposed) the key potential here is to meaningful represent something of the *functionality* of the narrative element in question, it is clear that comp-art is 'structurally predisposed' to represent the *functionality* of space, ecologies, environments[1907], rather than the *functionality* of personhood. It is arguable (see Conclusion) whether or not space is represented more meaningfully in comp-art, or whether we merely tolerate a lower semiotic resolution, and a greater mechanomorphism, from

1902 cite
1903 cite
1904 Noah berry
1905 Martin, 2011
1906 Newman, drawing on Friedman 2002
1907 Playing nature paper

perceived environments than we do from perceived persons[1908]: the answers to this question lie in the subtleties of human evolution[19091910]. Whatever the case, it is certainly true that, as Bruno Dias has it, 'palaces are cheap, and kings are expensive'[1911]: from videogames[1912] to digital heritage interpretation[1913], the 'stock affordances'[1914] of computational time and space for resonant narrative engagement are easier to achieve than the use of computational characters. As such, practitioners – from risk-averse commercial markets to academic AI developers[1915] to cash-strapped creatives[1916] - explore the path of least resistance and greatest appropriateness: the disparity between environment and character becoming wider and wider as resources and creative effort are ploughed into the former rather than the latter. As Chapter 2 demonstrated, this disparity is visible in many different forms across the comp-art spectrum. Characters are often neglected as 'animatronic'[1917] caricatures, or 'navigation cues'[1918] within a far more resonant, systemic world. Sometimes, characters are limited to non-human protagonists and deuteragonists, functioning as 'pets, companions, enemies [and] tools'[1919] in ways that better suit the mechanics of ecological simulation. The qualities of such characters can range from the 'coldly mechanical' and utilitarian[1920192119221923] to the more-nuanced and complex[19241925]; in either case, the animal characters function more successfully as a component of the wider, virtual environment than a human character of similar complexity; lending themselves more easily to the ecological or archetypal narrative forms found in comp-art.

1908 Skyrim makes a fantastic impression not because its individual elements are sharply honed, but because they contribute to a grander whole. (VanOrd, 2011)
1909 Cite 1
1910 Cite 2
1911 Bruno dias
1912 Cite 1 ex
1913 Cite 2 ex
1914 Bogost on gta
1915 Patrick Wilson on complexity of environments over agents.
1916 Bruno dias
1917 Bogost
1918 Playing with the past
1919 Animal characters in videogames'
1920 Jess joho
1921 Inder wildli
1922 Other one 1
1923 Other one 2
1924 Jess joho
1925 Inderwildi again

In works as diverse as *Walden*[1926] and Lawrence Lek's *Dalston, Mon Amour*[1927], characters are made deliberately absent or firmly preterite[1928], the 'empty… world'[1929] becoming narrativised as an interlocutor, an 'orthogonal' access to 'virtual pasts'[1930], or virtual elsewheres[1931][1932][1933][1934][1935][1936]. In other works, characters are deliberately simplified and subsumed into the systemic complexity of the world they inhabit, becoming 'tiny element[s]'[1937] in wider, flatter networks; crowds[1938] within less-granular simulations of personhood at scale[1939][1940][1941][1942][1943]. It is this cultural and industrial primacy of the computational environment (in combination, certainly, with the 'post-classical' and econarratological discourses explored in the previous section) that frequently sees the promotion of computational environments to the role of 'compelling, albeit unconventional, character[s]'[1944] in their own right. By any measure – of narrative resonance, of computation, of agency - they are often the most resonant characters in the entire experience[1945][1946][1947][1948].

* * * * *

Paradoxically, it is in these particularities of comp-art – the form's overwhelming reliance on environmental forms to support all manner of narrative experiences – that I believe a methodology for creating resonant computational characters presents itself. In Chapter 1 of this thesis, I defined an autocosmic methodology as one in which an artist draws on human engagement with objects, experiences and situations beyond the

1926 Cite again
1927 cite
1928 Characterisation in absentia emily short.
1929 bogost
1930 La motta, 2012
1931 Dias
1932 Paul martin
1933 cite
1934 Calleja 'ruins fetish'
1935 Meredith, like champion
1936 De Gruyter arctic base paper
1937 Building character rpi arts
1938 Machidon on crowd in virtual heritage john hopkins
1939 Cite again
1940 Phenomenology of real and virtual places.
1941 Alex smith rps crowds article.
1942 https://killscreen.com/previously/articles/minecraft-no-mans-sky-and-hunt-true-archaeology-sim/
1943 Champion "their rapture would leave no trace"
1944 The pastoral and the sublime in elder scrolls.
1945 Carbo-Mascarell
1946 Pastoral and sublime in oblivion
1947 Garden of bodies
1948 Paul Martin

bounds of their aesthetic remit – beyond the bounds of aesthetics entirely - as models for how their own audiences might engage with their work. In this chapter, I have demonstrated how lived and imagined environments have often been engaged by human subjects: as interactive, systemic social others in their own right. Combining such research with the clear strengths of existing environmental narrative design in comp-art suggests a different perspective on computational character altogether. If I draw on research into how human beings have bodily and psychically engaged with environment beyond 'the boundary between subjectivity and materiality, agency and passivity', beyond the 'divide[between]… characters and settings'[1949], can I use that research to then inform a methodology whereby I use the techniques and philosophies of environment design to inform character design? Can I look at how I can create computational characters that function more like computational environments, relying on my audience's evolved acclimatisation to interaction with environments as 'systemic persons'? Can characters become more like environments, and vice versa?

This functional metaphor (in Caracciolo's sense of the phrase[1950]), relying on an autocosmic consideration of imaginative engagement with place beyond the arts, has the potential to achieve the elusive balance between computation and narrative resonance that continues to elude computational characters; to solve the long-standing tension that Chris Crawford identified between 'spatial… [and] social reasoning' that lies at the heart of the form[1951]. If we stop trying to pursue systemic, functional models of personhood grounded in human psychology, or biology, or information science; if we move away from the unsuitable exemplars of other artistic forms; I believe that we can find new models of production, and reception, for characters that allow for complexity and depth, intimate interaction and knowledge, through computational simulation and interaction.

In Project `knole`, I have taken this autocosmic prompt and explored it in several ways, seeking inspiration for environment-led character design from a non-prescriptive continuum of human experiences and imaginings. Within the narrative of the project of a whole, and in the

1949 eskenlinen
1950 Econarratological theory of character.
1951 cite

interaction of its computational and non-computational elements, `knole` stands an example of an autocosmic approach to resonant computational characterisation: the final section of this chapter will explore some of the ways that this principle of 'character-as-environment' was applied.

Section 3.4: ‘Character-As-Environment’ In `knole`

PART 4 TO GO HERE.

"This goodly Work"

Concluding, And Continuing, Project `knole`

As she comes to sign off the letter that opens the *Housekeeping* – the last element to be written before it is 'Packett[ed]' and sent down to Mr. Cryer in the city – Anne's tone is measured, even sanguine. Despite her perceived disgrace at the hands of county wags, the death of her adoptive parents, and the failure of her intricate rituals to protect her from the 'Auld Fate' of women everywhere, in every age, she leaves Nighthead more determined than ever of her vindication. The near-miraculous powers of her 'beest' are never questioned: her mistakes are caused by the demands for her services, rather than any failure in her personal cosmology. Her anger, guilt, sorrow and traumas are cossetted and stifled in a cloak of superciliousness, weary superiority and, ultimately, blind confidence. She is certain that the young woman from her rare 'Dreems', her supposed 'subscryber', will climb the 'Auld Road' to Nighthead, take up their unexpected inheritance, and continue her 'goodly Work': how, in the light of what she has 'Viewed', could they not?

Project `knole` is an approach to a specific and long-standing challenge in narrative computational art: the challenge of balancing the necessary resonances of a character and its narrative with the 'particular'[1952] technical potentials of its realised form. In researching this specific issue, and developing practices to tackle it, I have derived a more general methodology: what I call the autocosmic. Rather than a unified, 'descriptive' theory of narrative[1953], the autocosmic is a 'stance' in the manner that Dennett defines that term. It is a design philosophy that 'produce[s] new ways of looking at things... ways of framing the questions.'[1954]. In theoretical terms, it is a nominal amalgamation of interrelated 'post-classical'[1955] positions across many discourses, all of which are concerned with 'the nexus of narrative and mind'[1956], and the indistinctions between previously-segregated areas of human narrative experience. I am not an originator of these ideas, merely their collator and

1952 Who says particular again?
1953 Koenitz
1954 dennett
1955 That quote again
1956 David Herman

their beneficiary. I have bound them together into a code of practice that can be used to 'prescribe'[1957] how artists might approach their work differently: beyond subject matter, political position or tools, but instead through the very basis of their audience's reception, and the methods of producing that reception. At its most basic, the autocosmic is an invitation for practitioners to cross borders that may once have seemed difficult to breach.

In the specific case of `knole`, I have used this autocosmic invitation to find alternate models of creating and maintaining personhood within narratives, beyond aesthetic tradition. I have tried to explore a wider gamut of human experience: those spheres in which we have perceived, and engaged with, systemic representations of personhood. I have used these exemplars as models for creating resonant computational characters in works of narrative comp-art: most visibly, through the consideration of character as a sort of ecology, or environment, and ecologies as persons in their own right.

Writing Anne as a major character, I've been painfully aware of her hubris, and it has made me cautious to avoid my own. Whether the audiences for my project 'subscrybe' to these methodological ideas – whether the resultant artworks resonate – remains of primary concern to me. However, measuring and analysing the results of my work, as Chapter 1.2 outlined, is difficult for *any* artistic work, even within well-defined disciplinary bounds[1958]. In that Chapter I tentatively set out some criteria by which the success of my work could be judged, both by myself and by others. In summary, drawing on my own observations during development of `knole`, and evidence both anecdotal and controlled (see Appendix 5), I believe that I have succeeded in creating a resonant, computational representation of narrative personhood: creating 'an enjoyable, satisfying and engaging experience'[1959]. The installation experience is one of complexity, empathetic interest, emotional engagement, corporeal activation, historical and contemporary context and interpersonal connection. I have used the systemic, interactive qualities of computation to stimulate, inform and entertain, drawing on my audience's intrinsic

1957 Koenitz again
1958 Koenitz
1959 Can an immersion exhibit

historical knowledge, evolved interpersonal sensibilities, and a capacity for critical consideration and insight[1960][1961][1962]. My work has inspired pleasure and delight, sympathy and regret, play and experimentation[1963], deep intellectual discussion and technical appreciation.

Beyond this specific implementation, however, I believe that my autocosmic methodology has interesting ramifications for future work. Developing it in tandem with `knole` has been an energising experience. It has helped me to develop a much deeper understanding of the mechanics of narrative response, and to recognise a need for greater interdisciplinary exploration into how narratives might be constructed to elicit this response. In particular, I am excited as to how it might be further applied to the challenges of narrative computational art: a form that, as Koenitz states, stands as the current 'narrative avant-garde'[1964].

* * * * * *

Like any artistic practice, or indeed any research project, success is a matter of degree, rather than binary achievement. Project `knole`, and the framework of the autocosmic, have taken me nearly five years to bring to fruition. In that time, I have encountered many challenges and redirections in my philosophical position, and technical challenges to my practice. My work has warped and wefted, and I have ended up in a very different place from the one I first envisaged in 2015. To my mind, there remain four major weaknesses to this project, and the autocosmic approach, which temper their effectiveness in solving the issues that I have identified in this thesis:

1) Weaknesses Of The Autocosmic Theory Itself.

In discussion with other scholars, I have concluded that the nominalised concepts of resonance, and the autocosmic, are the elements of this project that are most open to criticism. Of the two, I feel that resonance

1960 https://www.google.com/search?client=firefox-b-d&q=%22a+successful+interpretation+should+also+enable+the+visitors+to+make+their+own+constructions+of+the+past.%22
1961 Kidd 2015
1962 IDN for change.
1963 copplestone
1964 Koenitz

is markedly less controversial. At its heart, it is only a summation of the theory of audience response, a convenient term to stand for the gamut of 'active involvement[s] in the appreciative process'[1965], which remain the critical heart of most artists' pursuit of their goals. Autocosmics, however, is more indistinct, and less defensible: an attempt to create a new philosophical position, a 'generalizable convention'[1966], from a vast range of heterogenous 'postclassical' discourses across the arts and sciences.

It might simply be argued that autocosmics is a redundant concept, with little to differentiate it from the general postmodern[1967], or postpostmodern[1968], blurring of ontologies. As a methodology for working artists, it owes much to the modernist movement: the work of Magritte[1969], and Duchamp[1970], of the pop artists and the surrealists and the 'event artists', who sought to draw together scientific or political non-aesthetic practices with the 'ritualistic roots' of art[1971]? It might reasonably be asked why I had to invent a new term, and a new position, when I could have appealed to any one of the authorities that I have cited in Chapters 1 and 2 of this thesis. I am aware of how infectious this malady is amongst PhD students: inventing grand terms, and platforms, for discourses that already exist in only a slightly different form[1972], and thereby further 'dilut[ing their] terminological precision'[1973].

More pressingly, it might be argued that the pillars upon which autocosmics rests – the contingency of aesthetic distance, the evolved origins of narrative response and so on – are flawed in and of themselves. In all of the fields that I have cited in this thesis, the two tenets of imagination and narrative remain contested, troublesome, with as many arguments against the positions I take as exist in their favour[1974][1975][1976]. More than one source cautions that the imprecision of these terms means that they can always be moulded to fit any arbitrary intellectual position[1977][1978].

1965 AR paper
1966 Koenitz – design approaches to IDN
1967 Cite 14
1968 Cite 28
1969 cite
1970 Domain Of Images
1971 Desmond Morris
1972 Cite 22
1973 Calleja 2013
1974 Kind, 2013
1975 Stanford imagination entry
1976 Caracciolo – neuroscience is still in its infancy
1977 Ryan on Alan Palmers minds
1978 Calleja 2013

Interdisciplinarity, by its very nature, increases the risk that findings shared between fields will be 'miscommunicat[ed]'[1979] in some manner[1980], especially when crossing the conceptual divide of the arts and the sciences. It is tenable to suggest that the concept of the autocosmic, upon which I have based all this work, simply reflects a contingent, and quite possibly incorrect, conception of humanity's relationship to the world.

By their very nature, these are the hardest criticisms of my work to address. Autocosmics certainly is a part of the 'postclassical' position – a distillation of some of its findings to a particular end. It shares many of the tenets of its fellow travellers, from modernist art[1981] to cognitive narratology[1982] though (as I have asserted elsewhere) it lacks the political or 'descriptive'[1983] tendencies of these frameworks. I certainly feel that it is fair criticism of this thesis to state that it focuses on delineating and evidencing the *concept* of the autocosmic at the expense of detailing how this translates into a practical methodology. However, I do feel that for my own artistic development this delineation was necessary. In my research, I failed to identify another 'generalizable convention' that precisely fulfilled the criteria that I required of the autocosmic: the importance of the theorised homogeneity of human imaginative response to artistic practice. It is a convenient summary of multifarious strands of evidence that point to an uncertainty, a prevarication, at the heart of 'dominant models[,] that marginalize knowledge of alternatives'[1984] of 'broader conception[s] of narrativity'[1985]. It is a provocation, rather than a defense of all aspects of the 'postclassical' position. If I find an existing methodological position or theoretical standpoint that encapsulates my own ideas, I am happy to let the autocosmic be subsumed: it will have served its methodological purpose, at this stage in my artistic career. As for the correctness of the theories upon which it rests, I can only appeal to my research, and its evidence in this thesis. The benefit of using theory to inform methodology is that its integrity, or lack of it, can become embarrassingly apparent when it is implemented. An artwork's ability to resonate, it might be argued, is easier to determine than the integrity of a purely intellectual position: and

1979 Koenitz design patterns
1980 Marie-Laure Ryan - "problematic relation" between narratology and cognitive science.
1981 Cite 12
1982 Cite 13
1983 Koenitz again.
1984 cite
1985 cite

so my artistic practice will continue to serve as a partial, rolling litmus of the autocosmic's efficacy.

To conclude, I am happy for autocosmics to remain a particular manifestation of wider trends in intellectual discourse; one that does not strive for completionist rigour, but for its provocative ability as a 'boundary object'[1986], and its functional utility as a metaphor[1987]. It is designed to galvanise new action in the 'pragmatics' of narrative[1988], rather than to determine its nature. Perhaps it will have no direct use beyond this one project: and even if it does, perhaps it will have little to offer a wider community of artists, remaining an idiosyncractic expression of my own 'personal universe'. I look forward to finding out.

2) Weaknesses Of Execution And Ambition.

As I have stated elsewhere in this thesis, the process of developing the practice-based elements of `knole` has been a long process of trial, error, creativity and learning for me as an artist. Much of my practical progress with the `masterbeast`, the *Housekeeping* and the installation experience was hampered by how much I had to learn personally about the practicalities of comp-art. I could not just implement all of my ideas with an existing skillset, and often I found myself 'reinventing the wheel' solely in order to gain the foundational knowledge required to tackle a challenge. My ideas developed, changed or were discarded in response to my need to improving my programming abilities: to research and test a wide range of established AI algorithms; to develop new tools for sensor fusion in a mixed reality environment, because none of the existing products fitted my objectives or skillset. Sometimes, the tools I used were simply insufficient for the task at hand: Gamemaker: Studio, a game engine meant mainly for creating simple platformers videogames, began to struggle under the graphical and computational weight of the `masterbeast` simulation. It could certainly be argued that I had insufficient technical ability to match the work required: more than once it was suggested that I employ a programmer to help me develop boilerplate content so that I could focus on the more novel, creative elements of the project. Developing ragtag,

1986 Benford and giannachi
1987 Caracciolo.
1988 Ryan

personal implementations of long-standing computational practice was not, as Koenitz himself argues, a productive use of an artist's time[1989].

I would agree with some of the force of this argument: however, quite apart from the issues of cost involved in collaborating with a technical partner, I do feel that my piecemeal, stumbling progress through the technical aspects of the project did have its advantages. Gaining a holistic understanding of both the narrative and technical constraints of computational character helped me to develop my autocosmic theories in tandem with my practical work, and helped to provoke more novel solutions to those constraints. It was only by immersing myself in the practice of environment design, behavioural algorithms and procedural animation that I developed my 'character-as-environment' approach, by recognising that these 'low-hanging fruit' of computational design might be used in a way perpendicular to their original intention. Farming this work out to somebody well-versed in their conventions would, I propose, have made it far more difficult to question them. Of course, there is also the issue of personal development: I am now a more accomplished computational narrative artist, and I have already seen my new technical expertise benefit my work on other projects.

There is, however, still the question of overambition. The building of a systemic AI architecture, bringing together different techniques and modules from across the AI world, the development of MR sensor solutions *and* the creation of a well-researched historical narrative has been an enormous amount of work. Many features were prototyped but cut from the final build, including a fully-functioning vocal engine for the 'spyrit'[1990], a lighting engine, physics soft-body manipulation[1991], and a functioning, parasitic ecosystem ranging across the creature's skin, a systemic metaphor for Anne's relationship with Simon Awlbatch, the wandering cowherd at the centre of her psychic landscape[1992]. In hindsight, my project management left much to be desired, my production targets constantly moving and diverted by interesting ginnels of research. While a certain amount of experimentation is necessary for any artist improving their skills, I do feel that my time may have been better spent in focussing

1989 Koenitz' ASAPS work.
1990 See Appendix #9, Figure 12.
1991 See Appendix #9, Figure 9a.
1992 See Appendix #9, Figures 3a – 4a.

on a smaller remit, by which I might have avoided the hurdles of my overambition: from the overcomplexity and instability of the `masterbeast` simulation[1993] to the slightly underdeveloped nature of some of the project's features.

Finally, there are fair criticisms to be levelled at the 'situation factor'[1994] of `knole`. Its development as a situated installation with mixed reality functionality, and the transmedial 'user journey' from website, to the static *Housekeeping* text, to the final visit to the exhibition, has created issues of usability, and of resonance. My reasons for pursuing this mixture of methdologies with `knole` were both practical and ideological. As explored in both Chapter 2 and 3 of this thesis, I wanted to develop a mixed reality installation because of the resonant advantages afforded by that dynamic, as well as to remove practical hurdles, such as having to provide compatability with my audience's chosen hardware. As a practitioner increasingly working as a producer of interactive narrative experiences for museums, galleries and other public spaces[1995], I was interested in exploring some of the challenges peculiar to such narratives through my autocosmic methodology: in particular, the challenges of textual content in exhibition spaces, and the relatively-short dwell times of average visitors[1996][1997]. Some of my developmental decisions – for example, to deliver the *Housekeeping* to the audience member before their visit, were attempts to ameliorate these issues. However, as my time at the MWM showed (see Appendix #5), there remain many challenges to providing complex narrative experiences within an exhibition space. In particular, I am interested in exploring further how to manage the short duration, and shallow engagement of the average visitor's experience[1998] alongside the depth of simulation and narrative world, as compared to the 'huge psychological weight' and long-term engagement opportunities of the domestic videogame[1999]. There are two lines of enquiry here that I believe require further study:

1) What is the resonant value of framing individual, fleeting experiences of an exhibition narrative as individual components of a larger, composite

1993 Harvey Smith, 2002, in Tronstad
1994 kuzmicova
1995 Bonfire dog website.
1996 Ben gammon
1997 Exhibiting difficult games.
1998 Haywood and cairns
1999 This quote

experience, of many visitors working asynchronously to effect and affect a narrative world?[2000][2001] This is something I began to explore through the narrative conceit of the multiple recipients of Mr. Cryer's pamphlet (see Appendix #3), and through the persistence of audience member's actions (in the form of bruises, scars and the creature's ongoing emotional and physical state) for reception by subsequent visitors. I am further interested in the value of comparing and contrasting the different levels of engagement for different demographics of visitor, and understanding the relative value of each: even if some are arguably 'less-engaged' than others[2002].

2) How might an exhibitionary narrative such as `knole` court an ongoing, ideal relationship between visitors and a narrative world: perhaps by encouraging return visits, or self-documentation, so that 'interaction sessions are cumulative in their effect, [and] progressive and long-term relationships can develop'[2003]? Can a regular pilgrimage to a well-loved site, and deeper and deeper familiar engagement with an exhibit there, prove a viable framework for a situated narrative experience[2004][2005]?

3) Weaknesses Of Evaluation.

All of my work on `knole` has suffered for the simple fact that my public testing and evaluation of the project has been limited by logistical and practical issues. While the work has been informally tested and engaged with by a wide range of peers and potential audiences as I have worked on it, my residency at the MWM has been the only major public outing of the project prior to completing my PhD (see Appendix #5). At this point in development, the *Housekeeping* was not complete, and so the visitors to the Museum had to rely on hastily-devised contextual labels, and samples of final *Housekeeping* content, to frame their experiences with the `masterbeast`. I do not think this undermines my findings: as Chapter 1.2 of this thesis explores my own ' 'bottom-up... self-examination'[2006] of my work has intrinsic value as an evaluative source. Marie-Laure Ryan writes

2000 Cite 25
2001 Cite 30
2002 cite
2003 Intimate Machine 30 years frude
2004 Cite 98
2005 Cite 122
2006 Ryan

extensively of the value of 'speculative' narrative work, as opposed to purely 'experimental' approaches[2007]; and both Brenda Laurel and Mattie Brice question the necessity of experiencing a conceptual work in its entirety in order to understand its significance[20082009]. However, I cannot avoid the fact that any theory based on the nature of human response to art objects stands to gain from being fully tested with real human responses.

4) Weaknesses Of Virtual Environments.

My major implementation of the autocosmic methodology for resonant computational characters – the concept of 'character-as-environment' – rests upon the conviction that virtual environments are currently more resonant than virtual characters. I stand by the wealth of evidence to this effect: however, it also remains clear that, as Manovich states, 'computer spaces have a long way to go'[2010]. The 'formality gap'[2011] between the narrative significances of real, 'smooth' space and virtual, 'striated' space is well-defined in the literature[2012]: and many examples exist of computational environments that, similarly to computational character, fail to achieve a balance between resonance and computation. I saw this myself in my exploration of *The Elder Scrolls V: Skyrim* as part of my 'digital fieldwork' for this project (see Appendix #6): documenting a world that could feel mechanical, static or empty[201320142015]: 'mere setting or scenery'[20162017] with little immersive quality[2018] or 'cultural presence'[2019]. It was a criticism made by my study participants, as well: complaints that game environments were too 'static', too constrained, or too shallow[2020]. Indeed, as I argued in Chapter 3.3, the possibly lower standards of resolution we require from the computational depiction of space, and the instrinic mechanical resonance of spatial navigation, means that many methodologies exist – from procedural generation and graphical realism to

2007 Ryan
2008 Cite
2009 cite
2010 Manovich.
2011 Cite again
2012 Deleuze and guattari
2013
https://www.gamasutra.com/view/news/296319/Opinion_Why_does_Mass_Effect_Andromedas_open_world_feel_so_closed.php
2014 Playing The Past
2015 See Appendix #9, Figure 5e.
2016 Virtual ecology paper
2017 Bogost 'potemkin villages'
2018 Patrick lindseythe immersive fallacy
2019 Champion
2020 Bruce Janz

topographical breadth and 'worldfilledness'[2021202220232024202520262] - for the development of 'environments as simplistic vehicles for graphical spectacle or extractive resource management'[20272028].

Many of the citations above are rapidly aging, and other scholars have explored how digital environments are achieving greater and greater levels of systemic resonance with each passing year[2029]. However, it is clear that computational environments are not faultless exemplars of computational resonance, and that they still have many challenges of their own to face as the form evolves. As I explore in the final section of this conclusion, this raises further interesting questions which autocosmics may also be qualified to answer. In a reversal of the concerns of this thesis, perhaps environment design might benefit from practitioners looking beyond the narrow band of influences frequently cited (architecture and civic engineering, for example[20302031]) to find new models of creating spaces and places: perhaps, even, in the practice of creating characters[2032].

* * * * *

As Anne packs away the trappings of her new career, readying to leave behind her beloved father's house, her husband, the 'beest', her 'goodly Work', and the community that both shuns and needs her – that sustains her through their misunderstandings – she tries defiantly to hide her uncertainty about her next steps. Perhaps, she writes, she will try to find somewhere safe to see out her unwanted pregnancy: maybe, she writes, in 'that Plase they callt Lundon'. Perhaps, she concedes with not a little defeatist flair, she shall 'go where Gravitas may whim me, alyke a Stane upon the Brook'.

2021 Champion
2022 Kate Compton 10000 bowls of oatmeal
2023 Tanya Short
2024 Haptic Landscapes " "However, they are often used uncritically: space is just a container for something else, whether as a setting for a story or as a field for gameplay. "
2025 Hayot and Wesp 2009
2026 Nitsche 2008
2027 Virtual ecology
2028 Strick - "we are constantly presented with games that take those ideas, the product of a decades-long conversation, as immutable received wisdom."
2029 Digital ecologies
2030 Cite 23
2031 Cite 29
2032 Umran ali article rdr2

Considering my own next steps, I hope to go forth with slightly more direction than Anne. In the short term, I hope to take the finished installation, and all its component media, to showcase and test in other venues and exhibitionary spaces. These outings will provide me with opportunities to properly address the project's weaknesses, and gather more empirical data about its resonance with a variety of audiences.

Considering longer term prospects, I hope to continue working with cultural institutions on complex narrative experiences, both as a resident artist[2033] and as a professional consultant[2034]. As I have stated elsewhere in this thesis, advancing the work of heritage interpretation, and the other objectives of 'memory institutions'[2035], will require consideration of many of the ideas developed in Project `knole`: the use of narrative and character[2036], of mixed reality techniques[2037], of systemic and procedural expression[2038], and of environmental and interactive design[2039], to name but a few[2040]. Hopefully, these projects will be smaller in scope, and more iterative: helping me to improve and advance my ideas on character design and narrative resonance on a much more sustainable timeline.

In particular, I am excited to use such projects to refine my concept of 'character-as-environment', finding new ways to use an autocosmic exploration of the personifying, interactive and systemic relationship between humans and place to inform the construction of characters and their narratives. There are many avenues of research that I still want to explore, that I could only touch on briefly during my PhD studies: fields such as systems biology[2041][2042], the 'new cybernetics'[2043], econarratology[2044] and posthumanism[2045], which continue to introduce new and exciting fusions between systemic computation, narrative and ecology. These fields are full of ideas – such as symbiogenesis[2046], actor-network

2033 Artist website
2034 Consultancy site
2035 cite
2036 Citation for this
2037 citation
2038 Greef and latioli
2039 - "ecocritics and game designers may find an increasingly ripe source for analysis in the worlds constructed in videogames."
2040 Champion "Virtual environments can also present ideas, objects, or techniques difficult to perceive or conceive of in real-world form, or in conventional media."
2041 nayar
2042 varela
2043 cite
2044 caracciolo
2045 Nayar
2046 Margulis

theory, distributed cognition, morphogenesis[2047] and variable alterity[2048] - that further complicate and invigorate debates around the conceptual boundaries of personhood and environment. In general, they move away from considerations of 'sovereign, autonomous entities'[20492050] within environments, towards new 'punctualisations'[2051], new enframings of agency and individuality. In such discourses, the boundaries between agents, and the environments within which they act, are porous[2052]: the 'scale of analysis''[2053] is no longer the characterised individual, but systemic constructs at every level. In making such autocosmic forays beyond existing artistic methodologies, perhaps I can find even more exciting models for characters that move beyond the constraints of the traditional aesthetics – perhaps even beyond traditional biology – to refine the role and nature of character in narrative. Such environmental, systemic, decentralised notions of what a person can be seem well-suited to the concerns, and constraints, of narrative comp-art.

Of course, such approaches, particularly posthumanist and econarratological approaches[20542055], could be argued to threaten the concept of character altogether, and thus the precepts of this very thesis. They seek to 'unsettle the metaphysical primacy of the human'[2056], and all acts of anthropomorphisation. For some scholars, it means reducing character – indeed, personhood – to a Formalist construct, an arbitrary division of complex, interpenetrated biological and environmental systems. For Ian Bogost, himself a proponent of a posthumanist, 'flat' ontology, this is the primary reason why 'videogames are better without characters': that computational art should be concerned with artistic representations of 'systems larger than ourselves': letting 'processes predominate' as the primary foci of these experiences, rather than any semblance of a human-scale narrative[20572058].

2047 Hofstadter 545
2048 cite
2049 barbieri
2050 nayar
2051 cite
2052 Felix Geyer and Hans van der Zouwen.
2053 cite
2054 cite
2055 cite
2056 cite
2057 caracciolo
2058 Bogost critical path

I remain interested in redefining what character is and can be, from a methodological standpoint: to use provocative, interdisciplinary ideas as fodder for new implementations of character, in new implementations of narrative. However, I am not sure that I agree with Bogost and Caracciolo that this necessarily means removing all of 'narrative's tendency to foreground human protagonists, psychological causality, and human-scale temporality and spatiality'[2059]. Bluntly, I doubt that this is even possible. My research into evolved narrative responses (see Chapter 1.4) leads me to suspect that a narrative focus on the higher, systemic foci, without the grounding of a 'perdurant' human-esque character at their centre, will struggle to resonate as effectively. While Bogost takes his argument a step further, insisting that computational art is profoundly anti-narrative in any sense[2060], it seems clear in the various responses to his articles on this topic[2061][2062][2063] that comp-art will always be considered a viable option for narrative expression: and as such, I remain dubious that we can 'extricate character' – this intrinsic component of narrative - 'from anthropomorphic conceptions'[2064]. In my own work, I hope that I can extend and modify, rather than delete, a humanocentric conception of character in narrative comp-art. In drawing on these contemporary, interdisciplinary debates, I can already foresee autocosmic metaphors that I can apply to the concept of character, playing with concepts of personhood and humanocentric reception. This hybridity of character – of considering how human-esque agents can be conceived as more systemic, more interconnected, more environmental and ecological – at all sorts of scales and punctualisations - is to me the most interesting approach to 'character-as-environment'. I remain unsure what kinds of narratives are feasible, desirable or even imaginable within the bounds of computational art, but embracing a methodology that welcomes new ideas while understanding the value of long-seated conventions seems wise. It is out of such ambivalent concerns that resonant, systemic narratives can arise: experiences that are about systems not 'larger than ourselves'[2065], but precisely as large, and as complex, as we are.

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2059 cite
2060 cite
2061 Cite 123
2062 Cite 421
2063 Cite 422
2064 Cite
2065 Cite bogost

Beyond this one, particular implementation of the autocosmic, however, are larger questions: how this methodology might benefit artistic practice more generally. As Janet Murray asserts, we are at a milestone moment for 'interactive digital narrative', or narrative comp-art[2066]. Many different practitioners, schools of thought, methodologies and research frameworks now exist within the field: a field that is moving out of segregated disciplinary 'siloes' and into greater collaboration with others[2067]. Murray identifies the challenges that the field faces – many of which I have explored in this thesis – as well as the need for 'structural innovations' to help solve these challenges. I hope that the autocosmic, in its current and future forms, can be the source of some of those innovations, and that it will help me to continue pursuing my own 'goodly Work' – 'pushing the envelope of interactive narrative forms'[2068] - down whichever channels my career may eventually flow.

2066 Murray presentation.
2067 Thon
2068 Koentiz

Appendix 1

Fieldwork #1: Observation Of Character-Reader Relationships Within Reading Group

The theory of audience reception (which forms the heart of my autocosmic framework) sites as much of the constructive reality of a work of art in the mind of that audience as in the skill of the artist.[2069] Correspondingly, direct, qualitative, sometimes-longitudinal study of that audience has often been used by scholars to demonstrate, in 'real' respondents, how such construction manifests. While many of these studies exist[2070207120722073], I wanted to cement my co-option of the existing literature with a small piece of my own primary research, particularly as my work is concerned directly with the methodology of resonance. If, as an artist, I want to know how to produce resonance in my practice, it benefits me to see that resonance demonstrated by real audiences directly, rather than merely relying on scholarly accounts of it occurring.

The objective of this study was to delineate a general, Platonic baseline for character, outside of responses to specific media, against which I could later juxtapose the 'particular' responses to characters in computational art.[2074] Of course, it is arguable that an unmediated character does not exist, and I therefore chose the fictional characters of novels, and their readers, as my subjects. Given the form's ubiquity and originating position within narratology, literature seemed as good a window as any into 'typical' or 'universal' responses to fictional character.

Between September and December 2016, I shadowed a pre-existing reading group in the city of Derby in England; attending four meetings, one per month. The group was entirely female, and discussed a range of contemporary novels from *Kafka on the Shore*[2075] to Rose

2069 Wilson, Tony *Understanding Media Users: From Theory To Practice*. New Jersey: Wiley-Blackwell, 2009.
2070 Holland, Norman N *The Nature Of Literary Response: 5 Readers Reading*. London: Transaction, 1975.
2071 Mar, Raymond A *et al.* 'Exploring the link between reading fiction and empathy: Ruling out individual differences and examining outcomes'. *Communications* 34 (1) 2009, pp. 407-428.
2072 Bleich, David *Subjective Criticism*. Baltimore: The John Hopkins University Press, 1978.
2073 Slatoff, Walter J *With Respect to Readers: Dimensions of Literary Response*. New York: Cornell University, 1970.
2074 Keogh, Brendan, 2015.
2075 Murakami, Haruki *Kafka on the Shore*. London: Vintage, 2005.

Tremain's *The Road Home*[2076]. A different member hosted each meeting and provided a list of questions about the work to anchor the discussion, though talk often ranged far from the source text into discussions of other novels, the lives of the group's members and sundry topics.

During these sessions I sat within the group and silently observed the discussion, taking notes on how the group both individually and collectively conceptualised the characters of the source texts and judged their mimetic and metaleptical qualities. In particular, I was interested in how their choice of language concerning these characters revealed the nature of their autocosmic relationship with these 'non-actual persons', and how their judgements and discussion marked the effectiveness (or not) of that character's ability to resonate with them.[2077] At two of the meetings, I asked the group additional, direct questions about characters in prose fiction. The ensuing discussions ranged from identification of the important qualities of characters generally, to disussing characters from other works whom they disliked as narrative constructions: that is, characters who lacked resonance.

While many studies exist which try to understand personal responses of real audiences to character, as a way to evince the theories of audience reception, my small study provided me with my own direct data, tailored to my particular enquiry. It has allowed me to develop an understanding of how audiences recieve, extrapolate and help to construct characters into *persons* of their own, and how artists creating those characters might facilitate this process. Importantly, it also provided examples of the 'qualities [of]... more static art-forms', mentioned in my primary research question, which become an important point of comparison later in this thesis.

2076 Tremain, Rose, 2009.
2077 Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions'. p. 3

Appendix 2

Fieldwork Report #2: Supervised, Self-Narrated Interaction With Computational Characters

While audience reception theory has been explicitly paralleled within computational art, in particular within game studies[2078][2079], critical observations of 'real' audiences undertaken within such a framework remain rare[2080]. As a point of comparison to my reading group study outlined in Appendix 1, I wanted to use direct observation of videogame players to augment my theoretical outline of how autocosmic responses to characters in computational art both cleave to, and differ from, the more general precepts of reception theory. In particular, I was interested in how such variations impact on concepts of imaginative engagement, character, narrative and discussions of quality and resonance. I wanted to codify how an illustrative range of modern videogames, as prime examples of narrative computational art, approach the tensions that arise from these variations; tensions which form the central problem of this thesis.

Over the course of two days in March 2017 I invited self-selected participants, recruited through the Bath University message boards and the Computer Science Department internal mailing list, to participate in the study. Of the six participants, two were female and four were male. All had played videogames in the past, though some were far more active consumers than others, and they demonstrated a range of tastes, preferences and previous experiences with the form. The participants were invited to sit at a desktop PC and play one of four videogames for one and a half hours[2081]. The choice, in part pre-determined and in part shaped by the participant's own preferences, lay between fantasy roleplaying game *The Elder Scrolls V: Skyrim*[2082], minimalist platformer *Thomas Was Alone*[2083], the narrative nature game *Shelter*[2084] and the 'walking simulator'[2085] *Everybody's Gone To The Rapture*[2086].

2078 Sanders, April *Parallels Between The Gaming Experience and Rosenblatt's Reader Response Theory*. Ph. D thesis. The University of North Texas, 2013.
2079 Sanders, April 'Understanding The Video Game Experience Through Reader Response Theory'. *Read* 2 (3). 2016, pp. 45-63.
2080 Roth and Koenitz
2081 See Appendix #9, Figure 1.
2082 Bethesda Game Studios, 2011.
2083 Bithell, Mike, 2012.
2084 Might And Delight *Shelter* [PC Software] US: Might And Delight, 2013.
2085 Carbo-Mascarell, Rosa 'Walking Simulators: The Digitisation of an Aesthetic Practice'. *Proceedings of the First International Joint Conference of DiGRA and FDG* 1 (13), 2016.
2086 The Chinese Room *Everybody's Gone To The Rapture*. UK: Sony, 2015.

While the participants were playing the game, I asked them to self-narrate their experience: a well-established technique in commercial videogames testing[2087]. I sat beside and slightly behind the participant during their play session, taking notes both on my observation of their manual and autocosmic interactions with the game, its systems and environments, its characters and their narratives, and their self-narration of those interactions. The day after the study, I sent the participants an exit questionnaire which asked them to give more considered answers to questions about the qualities of the characters they had experienced, both as constructed, procedural elements of a computational artwork and as 'non-actual persons'[2088][2089].

This study provided an interesting companion to my original reading group study. It demonstrated the similarities and differences between audience reception of characters in literary and computational art, revealing some of the apparently universal qualities of fictional characters and those which are 'particular' to computational art.[2090] Most importantly, it helped to directly demonstrate the problems of current characterisation practices in videogames and narrative computational art more generally, and provided clear, methodologically-relevant connections between the literature and 'real' audiences responding: a vital component of my own development of a resonant computational character, similarly designed for the reception of 'real' audiences.

2087 Hoonhout, Henriette 'Let The Game Tester Do The Talking: Think Aloud and Interviewing to Learn about the Game Experience'. In: *Game Usability: Advice from the Experts for Advancing the Player Experience*. Burlington: Morgan Kaufman, 2008, pp.65-77.
2088 Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions'. p. 3.
2089 See Appendix #9, Figure 14.
2090 Keogh, Brendan, 2015.

Appendix 3

A Discussion Of Player Characters (PCs), Non-Player Characters (NPCs), And Their Relevance To This Project

In this thesis, I have explicitly focussed on those 'distinct… entit[ies]'[2091] in computational art whose perspective and personhood are distinct from that which the audience adopts as an interactant; characters over which the audience does not have any major,'explicit'[2092] control, and who do not 'function… as a focus for… [the player's] agency'[2093] or as a 'digital prosthesis'[2094]. Videogames provide the clearest definition of this distinction: between NPCs or 'non-player characters'[2095], and the player character, 'avatar' or PC. This is a definition which has transcended one particular industry and is now regularly employed in reference to other narrative, character-led computational artworks, including those within cultural heritage[20962097]. While I would assert that both are examples of computational character, and both are capable of resonance through autocosmic engagement, there remain complex, mode-specific differences between them which limit my ability to address the latter within this project.

The idea of player character is unquestionably tied up in the complex narratological concepts of protagonism, narration[2098], empathic identification, 'experience-taking'[2099] and the 'meeting of minds'[2100] which form one of the 'basic psychological process[es]'[2101] of engaging with fictional characters. However, a complication in this relationship arises from the fact that such characters are not merely observed and

2091 Banks, Jaime *et al. 100 Greatest Video Game Characters.* Maryland: Rowman & Littlefield, 2017, pp. 47.
2092 Salen, Katie and Zimmerman, Eric. *Rules Of Play: Game Design Fundamentals.* Cambridge: MIT Press, 2004, p.60.
2093 Liboriussen, Bjarke *The Mechanics of Place: Landscape and Architecture in Virtual Worlds*. Ph.D. thesis, University of Southern Denmark, 2009, p.45.
2094 Papale, Luca 'Beyond Indentification: Defining The Relationships Between Player And Avatar'. *Journal Of Games Criticism* 1(2). 2014, pp. 1-12.
2095 Tronstad, Ragnhild 'NPC (Nonplayer Character)'. In: *The John Hopkins Guide To Digital Media*. Baltimore: John Hopkins University Press, 2014 p.
2096 Vosinakis, Spyros 'Digital Characters in Cultural Heritage Applications'. *International Journal Of Computational Methods in Heritage Science* (1), 2017.
2097 Granstrom, Helena *Elements In Games For Virtual Heritage Applications.* Masters thesis, University of Skovde, 2013, p. 14.
2098 Margolin, Uri *Narrator*, 2014. [Online] Available from: http://www.lhn.uni-hamburg.de/article/narrator [Accessed 18th August 2018].
2099 Kaufman, Geoff and Libby, Lisa 'Changing Beliefs and Behavior Through Experience-Taking'. *Journal of Personality and Social Psychology.* 2012, p. 1.
2100 Oatley, Keith 'Meeting of minds: Dialogue, sympathy and identification, in reading fiction'. *Poetics* 26 (1), 1999, pp. 1.
2101 Bley, Edgar S 'Identifcation: A Key to Literature'. *The English Journal* 34 (1), 1945, p. 26.

incorporated into the audience's experience autocosmically or empathetically, in the same manner as other people (as I assert in Chapter 1), or even merely interacted *with* in computational art, but are materially and directly controlled by the audience themselves as an 'epistemic and behavioural proxy'.[2102] The approaches that computational artists take to this component of their work are numerous, as demonstrated by the games played by my study group (see Appendix 2). Some games, such as *Skyrim*[2103], are steeped in a tradition of providing the audience with the ability to almost completely define their protagonist's appearance, personality, actions and character, albeit from a large subset of predefined traits, races and classes, all with their own authored affordances. Others, such as *Shelter*[2104], present you with an individual character already authored, set into a particular circumstance and wedded to a very specific sort of expressive control. Others, such as *Thomas Was Alone*[2105], maintains an indistinction between NPC and PC, allowing you switch at will between several, well-defined characters who maintain relationships with each other, made explicit by the narration. Who the 'player character' is in this scenario is indistinct.

Alongside this range of approaches is a similarly diverse array of theoretical engagements with the autocosmic relationship between audience and player character. Scholars debate to what extent audiences 'adopt'[2106] pre-existing characterisations as their own identity, or preserve an 'alterity'[2107] which allows that audience to conduct parasocial or social relationships with the PC as they take on their perspective[2108][2109][2110][2111]; some chart the audience's ability to 'introject'[2112] or 'self-insert'[2113], treating the

2102 Tavinor, Grant, 2007, p.84.
2103 Bethesda Softworks, 2011.
2104 Might And Delight *Shelter*.
2105 Bithell, Mike, 2012.
2106 Hefner, Dorothee *et al*. 'Identification with the Player Character as Determinant of Video Game Enjoyment'. In: *Proceedings of ICEC 2007*. Shanghai: ICEC, 2007, pp. 39 – 67, p. 39.
2107 Seraphine, Frederic. *Ludonarrative Dissonance: Is Storytelling About Reaching Harmony?,* 2016 [Online]. Available at: http://www.fredericseraphine.com/index.php/2016/09/02/ludonarrative-dissonance-is-storytelling-about-reaching-harmony/ [Accessed: 18th August 2018].
2108 Banks, Jaime and Bowman, N.D. 'Avatars are (sometimes) people too: linguistic indicators and social ties in player-avatar relationships'. *New Media and Society* 18 (7), 2016, pp.1257 – 1276.
2109 Richard Bartle 2004 'role-playing paradox'
2110 Vella, 2013
2111 De Wildt, 2014
2112 Van Looy, Jan. *Understanding Computer Game Culture: The Cultural Shaping Of A New Medium*. Saarbrucken: Lambert Academic Publishing, 2010, p .117.
2113 Ashwell, Sam Kabo *A Bestiary of Player Agency,* 2014 [Online]. Available at: https://heterogenoustasks.wordpress.com/2014/09/22/a-bestiary-of-player-agency/ [Accessed: 18th August 2018].

characters-as-represented as objects[2114], tools or 'vehicular embodiement[s]'[2115] for their own self-determined characterisations. I certainly observed this range of autocosmic responses within my study group. Some participants verbally and behaviourally identified with the characters they controlled, treating them as extensions of their own body and mind, or as tools for interaction with the gameworld: others spoke about the characters on screen as persons in their own right, with whom they were conducting a relationship only partly based on control.

Project `knole` does not ignore the concept of player character. As one of 'the most important aspects of game storytelling'[2116], the perspective that the interacting audience takes affects almost every other part of the experience, including the resonance of non-player characters such as the 'spyrit'. I chose to minimally define the audience's perspective, and the character that they must adopt, through their interaction, within `knole`'s storyworld: there is no particular, author-defined avatar, but instead a direct interaction with the physical and virtual elements of the installation using the visitor's own bodies, postures, interactions and performances, facilitated by the natural interfaces of the work. I designed for direct engagement with the 'spyrit', with no 'avatar bias'[2117] and an almost-complete 'motor convergence'[2118] between visitor and 'player character' for several reasons. Primarily, this design served to reduce the distance between the visitor and the 'spyrit' as a character, allowing me to experiment with intimacy, direct manuipulation and other mixed-reality concepts as facilitators of resonance. The design served to focus attention on the 'spyrit' as character, rather than splitting investment between the 'spyrit' and some protagonist whom the visitor would almost certainly prioritise (see Chapter 2.2). While the characterisation I do provide is certainly subject to what Harvey Smith calls the Imago Effect[2119], guiding the context of the visitor and encouraging certain behaviours and interactions with the 'spyrit', I did not want to constrict or pre-define the audience's autocosmic engagement more than was necessary or appropriate

2114 Martin, Paul 'The Pastoral and the Sublime in Elder Scrolls IV: Oblivion'. *Game Studies* (11) 3, 2011.
2115 Newman, James, 2002.
2116 Lankoski, Petri 'Player Character Engagement In Computer Games'. *Games And Culture* 6 (4), 2011, pp. 291-311, p. 292.
2117 Seraphine, Frederic 2016.
2118 Gregerson, A.L. and Grodal, T 'Embodiement and Interface'. In: *The Video Game Theory Reader 2*. London: Routledge, 2009.
2119 Smith, Harvey. *The Imago Effect: Avatar Psychology*. Game Developer's Conference, San Francisco, March 5th 2007.

within the fiction. This was particularly important because, as my installation at the Museum of Witchcraft and Magic demonstrated (see Appendix 5), visitors can be intimidated by the demands of interaction and performance within an installation space; something which, it may be theorised, specific roleplaying requirements may exacerbate.

Instead, the light-touch characterisation of the visitor opened up several, non-prescriptive interpretations of their role in the installation, responsive to the level of engagement they adopted. The *Housekeeping,* if closely read, encourages the reader to identify with the young woman to whom Anne Latch addresses her missive: a well-to-do young debutante of Sheffield's new middle classes, bored of her cossetted existence, and to whom Anne leaves her entire operation with the 'spyrit'. Anne's almost-forensic dreams of the young woman, an account of which opens the *Housekeeping*, serve to facilitate adoption of this character's role, without explicit instruction, by the visitor/reader: characterising the young 'Miss' as more accustomed to the comforts that twenty-first century life now affords to rich and not-so-rich alike (constant diversion, warm housing and exotic food) than the impoverishments that Anne's working-class contemporaries are forced to suffer; conditions which Anne, through her 'moderne' work and her flight from Nighthead, seeks to escape.

The narrative also reveals, and facilitates, a much wider set of characterisations for the audience to adopt: as Anne's publisher William Cryer does not honour her wish to only print one copy of the *Housekeeping*, and instead publishes hundreds in order to capitalise on Anne's scandalous reputation, each visitor to the installation can potentially adopt the role of another, anonymous purchaser of the pamphlet, come to Anne's kitchen to claim the 'spyrit' and Anne's house for themselves. The cumulative effect of multiple visitors upon the 'spyrit's' body and psychology, then, becomes a powerful representation of Mr. Cryer's greed, the power of the emerging mass media in the eighteenth century, the hubris of Anne's superstitious infamy, and the effects of instrumentality and mechanomorphism upon real and digital persons alike.

The visitor may, of course, merely identify as themselves: twenty-first century visitors to Anne's kitchen, discovering a creature who

has been waiting nearly 250 years for its mistress to return. Each perspective is 'coherent' with the work, facilitates resonant engagement with the storyworld, and deals with different facets of the work's thematic concerns: allowing the reader to engage with the historicity and narratology of the work through lenses of gender, labour relations, social relations and others. Whichever role is adopted, the 'spyrit' at the centre of the installation is concerned, behaviourally, with only one metric: how the visitor's actions and performances and chosen 'role' cleave, or do not cleave, to Anne's own actions and performances, as laid out in her *Housekeeping*. In performing her 'cunning' work with the 'spyrit' for two years, Anne's relationship and presence has come to define, and structure, its entire existence. In this, it is Anne herself which the visitor is most invited to identify with, and her role and presence which they are most encouraged to adopt.

Perhaps the most important reason for taking this less-than-prescriptive approach to visitor characterisation is that the resonance of player characters lies, necessarily, outside the purview of this thesis. While I certainly think that the autocosmic model would be of great use to 'player character' design, the many complications of the task – between characterisation and instrumentality, between what Calleja calls the 'entity' and the 'self'[2120], and the potential for dissonance between player and character[2121] - may require a different direction for the researcher or artist seeking such a particular brand of resonance, and different examples and inspiration from beyond the narrowly aesthetic upon which to draw. Such 'non-actual persons'[2122] lie along a more complicated, yet equally fruitful, line of enquiry than my own.

2120 Calleja, Gordon, p. 124
2121 v, Frederic 2016.
2122 Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions'. p. 3.

Appendix 4
Videogames, Digital Installation Art And Their Critical And Methodological Overlaps

Project knole, beyond being a work of comp-art, might more specifically be defined as a piece of digital installation art. This is a well-defined area of study and practice in its own right[2123], and I have drawn on its discourses throughout the development of the Project. However, it will be clear from my bibliography and this thesis that a larger proportion of my research has been drawn specifically instead from videogames culture and its academic corrollary, game studies[2124][2125][2126]. This is despite the fact that, at first glance, knole has little in common with the 'classical' videogame.

The reasons for this discrepancy are several, though primarily because videogames are the cultural manifestation of comp-art with which I have most familiarity. I grew up playing videogames, rather than visiting digital installations; my introduction to programming and interactive narrative design came under the aegis of text-based and graphical games; my professional networks and didactic influences arose from that culture; and my interests in the wider academia around such practices have, naturally, stemmed from the same discipline.

However, under scrutiny the divisions between these two seemingly disparate examples of comp-art are significantly weakened, and the utility of game studies and videogame practice to *all* comp-art becomes apparent. In a detail which perhaps mirrors the wider trend toward post-classical, relational and expressive definitions of artforms charted throughout this thesis, the popular definitions of videogame have shifted from the 'narrow discussions of formal definitions' which dominated early discourse[2127], focussing on ludological 'artificial conflicts', skill-based competitions and 'quantifiable outcomes'[2128] (often, as Chapter 2 outlined,

2123 Mondloch, Kate, 2014, p.149.
2124 Voorhees, Gerald 'The Character of Difference: Procedurality, Rhetoric and Roleplaying Games'. *Game Studies* 9 (2), 2009.
2125 Ryan, Marie-Laure 'Beyond Myth And Metaphor – The Case of Narrative in Digital Media'. *Game Studies* 1 (1), 2001.
2126 Simons, Jan 'Narrative, Games and Theory'. *Game Studies* 7 (1), 2007.
2127 Keogh, Brendan 'Across Worlds And Bodies: Criticism In The Age Of Video Games'. *Journal Of Games Criticism* 1 (1), 2014, p.1.
2128 Salen, Katie and Zimmerman, Eric, 2004, p.

arguing against the role of narrative in games altogether) to a greater pluralism[2129][2130][2131][2132] which concentrates on a more multidimensional consideration of the form; encompassing affective, phenomenological, social and narrative elements[2133] united only, at the most base level, by the computational mode, a 'system... defined by rules'[2134]. The 'game/not game'[2135][2136] demarcation that has often occupied critical theory in the form is now a shifting and evolving one. There is much more engagement with works which possess few, if any, of the ludological tenets that define earlier and more purely formal definitions of the videogame, and which often directly challenge the 'designed presumptions'[2137] of the paradigm: particularly when it comes to confronting issues of narrative, using unusual input/output media, and employing novel models of interaction. Now the economic, social, cultural, methodological and philosophical bounds of videogames parlay with 'not-games'[2138], 'playable stories'[2139], interactive fiction such as Twine Stories[2140], avant-garde works[2141], academic outputs[2142], 'art-games' and 'critical games'[2143], 'interactive experiences'[2144] and 'strange... unstable... hybrids between games and narratives'[2145] of all stripes, most of which 'cannot be easily folded into the field of games in general'[2146]. There continues to be much discussion about the 'conceptual baggage'[2147] of the term 'game' in the culture, particularly as it bleeds into surrounding discourses of comp-art: terms such as 'virtual interactive media'[2148] and

2129 Zimmerman, Eric. *No Single Definition*, 2013 [Online]. Available at: http://www.criticalpathproject.com/video/no-single-definition/ [Accessed: 18th August 2018].
2130 Alderman, Naomi *Don't listen to those who try to own the definition of a video game*, 2015 [Online]. Available at: https://www.theguardian.com/technology/2015/dec/04/video-games-gaming-dudegamers [Accessed: 18th August, 2018].
2131 Kahurlahti, 2015
2132 Keogh
2133 Calleja, Gordon, 2011.
2134 Salen, Katie and Zimmerman, Eric, 2004.
2135 Kopas, Merritt *ed. Videogames For Humans.: Twine Authors In Conversation.* US: Instar Books, 2014.
2136 Anthropy, Anna *Rise of the Videogame Zinesters: How Freaks, Normals Amateurs, Artists, Dreamers, Drop-outs, Queers, Housewives, and People Like You Are Taking Back an Art Form*. US: Seven Stories Press, 2012.
2137 Salen, Katie and Zimmerman, Eric, 2004.
2138 Samyn, Michel *Not a manifesto*, 2010 [Online]. Available at: http://notgames.org/blog/2010/03/19/not-a-manifesto/ [Accessed 18th August 2018].
2139 Koenitz
2140 Kopas, Merritt, 2014.
2141 Schrank, Brian. *Avant-garde Videogames: Playing with Technoculture*. London: MIT Press, 2014.
2142 Pearce, Celia 'Independent and Art Games'. *In:* Ryan, Marie-Laure *et al. The John Hopkins Guide To Digital Media*. Baltimore: The John Hopkins University Press, 2014.
2143 Flanagan, Mary, 2009.
2144 Kill Screen, *Is It Time To Stop Using The Term 'Walking Simulator',* 2016 [Online]. Available at: https://killscreen.com/articles/time-stop-using-term-walking-simulator/ [Accessed: 18th August 2018].
2145 Jenkins, Henry, *Response to Bogost (Part Two)*, 2006 [Online]. Available at: http://henryjenkins.org/blog/2006/08/response_to_bogost_part_two.html [Accessed: 18th August 2018].
2146 Calleja, Gordon, 2011, p. 183.
2147 Veale, Kevin '"Interactive Cinema Is an Oxymoron, but May Not Always Be'. *Game Studies* 12 (1), 2012.
2148 Mol, Angus *et al. The Interactive Past: Archaeology, Heritage and Video Games.* Leiden: Sidestone Press, 2017, p.

'interactive digital narrative'[21492150], have been proposed, while others see the term 'game' as a necessary shibboleth for talking about a wider, and ultimately untriangulated, landscape of works[21512152].

Correspondingly, other forms of 'digital art', 'new media' and comp-art have borrowed from the videogame canon and blurred the boundaries even further. Ryan compares the videogame to the novel as the dominant storytelling form within digital culture, holding the most cultural prominence, methodological influence and focus upon narrative practice[2153]: a 'paradigmatic emblem'[2154] of the fusion of systemic procedurality, human-computer interaction and expressive meaning-making[2155]. For Reidl, similarly, it is 'the largest class of commerical product through which the public regularly comes into contact with artificial intelligence' (presumably in the sense of embodied virtual agents)[2156], and for Champion, its 'massive influence on culture' make it impossible to segregate from the rest of the comp-art landscape[2157]. Consequently, discourses as diverse as human-computer interaction[2158], narratology[2159], artificial intelligence[216021612162], and heritage interpretation[21632164216521662167216821682169] have all drawn from the videogames discourse to advance their own resonant practice. Of particular interest is the osmosis between digital installation art and

2149 Koenitz, Hartmut, 2015.
2150 Janet Murray presentation
2151 Hecker, Chris *The Word 'Game'*, 2016 [Online]. Available at: http://www.criticalpathproject.com/video/chris-hecker-the-word-game/ [Accessed: 8th August 2018].
2152 Zimmerman, Eric *Heller Interview*, undated [Online]. Available at: http://www.ericzimmerman.com/texts/HellerInterview2.htm [Accessed: 8th August 2018].
2153 Ryan, Marie-Laure, 2009.
2154 Manovich, Lev, 2001, p.
2155 Newman, James, 2002.
2156 Riedl
2157 Champion 'applying game design'
2158 Dix, Alan *et al.,* 2004.
2159 Ryan, Marie-Laure, 2014.
2160 Stuart, Keith, 2016.
2161 Russell,Stuart and Norvig, Peter, 2009, p.
2162 Yannakakis, Georgios and Togelius, Justin *Artificial Intelligence and Games*. New York: Springer, 2018.
2163 Champion, Erik *Game Mods: Design, Theory and Criticism*. Australia: ETC Press, 2012.
2164 Graham, Shawn *Writing History With Interactive Fiction*, 2010 [Online]. Available at: http://www.playthepast.org/?p=68 [Accessed: 8th August 2018].
2165 Chapman, Adam. *Digital games as history: How videogames represent the past and offer access to historical practice*. London: Routledge, 2016.
2166 Ioannides, Marinos *et al. Mixed Reality and Gamification for Cultural Heritage*. London: Springer, 2017.
2167 Tyler-Jones, Matthew *Building an Apotheosis Machine*. York University Department of Archaeology, February 10th, 2015.
2168 Machidon, Octavian *et al.*, 2016.
2169 Champion Book

videogames[217021712172], with many artists such as Lawrence Lek[2173], Jeremy Couillard[2174] and Ian Cheng[2175] combining videogame technologies and narrative techniques with the participatory, spatial elements of installation art, producing works that are more at home in galleries than living rooms.

Thus my reliance on videogames and game studies for this Project's foundation is an exercise in broadening my methodology, rather than narrowing it. However helpful or limiting the term 'videogame' might be, it certainly encompasses far more discussion, and practical exemplars, for the computational artist than its ludic connotations would imply. It is where many of the challenges and problems of computational character that I identify in Chapter 2 are not only evident, but actively tackled. Videogames remain the 'current apotheosis of high-level human-computer interaction'[2176], the poster child of narrative comp-art, and in this `knole` is as much a videogame, an interactive, procedural, systemic work of narrative expression, as the latest *Mario* release. Consequently, it shares a similar crop of concerns with other works that lack a 'well-established and fixed field'[2177]: concerns that have their roots, ultimately, in computation.

Appendix 5

2170 Thom, Danielle *Are art installations the new video games?,* 2014 [Online]. Available at: https://www.apollo-magazine.com/art-installations-new-video-games/ [Accessed: 8th August 2018].
2171 Poulsen, Diana *Art and Video Games: Intersections*, 2011 [Online]. Available at: http://www.gamasutra.com/view/feature/134796/art_and_video_games_intersections.php [Accessed: 8th August 2018].
2172 Flanagan, Mary, 2009.
2173 Lek, Lawrence *Bonus Levels*, undated [Online]. Available at: http://bonuslevels.net/ [Accessed: 8th August 2018].
2174 Couillard, Jeremy *jeremy c*, 2018 [Online]. Available at: http://www.jeremycouillard.com/ [Accessed: 8th August 2018].
2175 Cheng, Ian, 2018.
2176 Newman, James. 'In search of the videogame player'. *New Media And Society* 4 (3), 2002, pp.405-422, p. 405.
2177 Montfort

Fieldwork Report #3: Pilot Study of Project `knole` at the Museum Of Witchcraft and Magic, Boscastle, Cornwall

In July 2018 I undertook an intensive three-day residency at the Museum of Witchcraft and Magic (MWM) in Boscastle, Cornwall, showcasing a prototype version of `knole` to the museum's visitors. I had conducted several smaller, more informal tests and demonstrations of my practice throughout my PhD, but this was to be the main public user study of the work prior to submission.

The residency was designed to fulfil several objectives. It was to give my work exposure to a 'real', rather than an 'ideal'[2178] or self-oriented[2179] audience; an audience from a wide variety of unpredictable demographics, backgrounds and perspectives, united only by their attendance at an institution whose historiographic remit had inspired and informed much of Project `knole` itself[2180]. The MWM has several permanent displays on cunning folk, familiar spirits and the rituals of popular magic[2181], and I felt that it would be an apt testbed for observing how my theories on resonance, autocosmics and computational character manifested *in situ*, as well as allowing for more mundane methodological testing of my practice, the technology employed and the installation dynamic at work.

The `masterbeast` installation, in its prototype form, was set up in the Library space above the museum proper[2182]. Most of the physical and computational elements were fully implemented, including the darkened room, voice recognition software, webcams for motion and face detection, the LED candles, the chalked circle and many of the props. The *Housekeeping* was not at that point sufficiently developed (nor were its ritual components sufficiently integrated into the `masterbeast`'s codebase) to provide a draft for download on the website. Instead, I created some supplementary materials specifically for the installation: these included samples from the *Housekeeping*, interpretative texts to introduce Anne's narrative, my research and its context within the museum itself, as

2178 DeMaria Jr., Robert 'The Ideal Reader: A Critical Fiction'. *PMLA* 93 (3), 1978, pp. 463-474.
2179 Murray, Donald, 1982.
2180 Museum of Witchcraft and Magic *Visit*, 2017 [Online], Available at: https://museumofwitchcraftandmagic.co.uk/visit/ [Accessed: 8th August 2018].
2181 Ibid.
2182 See Appendix #9, Figure 13e.

well as some samples of Anne's ritual instructions to guide visitors' interactions with the installation.

For some months before and during the residency, both I and the museum's curators had been publicising the installation online[2183][2184] and in the museum's marketing literature, and directing interested parties to the Project's website to learn more about the work and sign up for the mailing list. This tactic only garnered 10 new subscriptions to the mailing list prior to the start of July, though the curator reported that he had received much verbal expression of interest from regular visitors, volunteers and 'friends' of the museum[2185]. During the residency, visitors were also informed at reception about the installation (access to which was included in their ticket price), and through the use of billboards directing them to the usually-private Library entrance.

Once they had entered the Library, visitors were free to interact with the installation for as long as they wished, and to return as many times as they liked. The `masterbeast` dominated the room (which could fit roughly 6 members of the public and myself), and to one side was a table containing the supplementary textual materials. I was present in the installation space at all times during the three-day period: welcoming visitors, answering their questions if prompted, taking notes, and (with written permission) video-recording their interactions with the `masterbeast` for later analysis. Certain visitors (again subject to permission) were also asked a series of questions about their experience both during and immediately after their visit, including:

- Did you enjoy the experience?
- What were your initial impressions of the character portrayed in the installation?
- Can you describe their personality?
- How did you feel towards the character?
- How did it relate to what you experienced in the museum itself?

2183 Museum of Witchcraft and Magic @mwm *Meet a spirit familiar* ***@witchmuseum*** *this july http://museumofwitchcraftandmagic.co.uk/event/meet-the-spyrit-familiar-of-an-18th-century-cunning-woman/ ...*, 25th April 2018 [Twitter] Available at: https://twitter.com/witchmuseum/status/989052889447436288 [Accessed: 8th August 2018].

2184 Sherman, Robert *Museum Library Is Home To A 'Witch's Familiar' This Week,* 2018 [Online]. Available at: https://museumofwitchcraftandmagic.co.uk/news/museum-library-is-home-to-a-witchs-familiar-this-week/ [Accessed: 8th August 2018].

2185*Friends of the Museum of Witchcraft and Magic*, 2018 [Online]. Available at: http://friendsofthewitchcraftmuseum.co.uk/ [Accessed: 8th August, 2018].

Over three days, the installation attracted roughly 80 visitors. Approximately 5% of these were self-identified magical practitioners or followers of pagan religions[2186], a rather unique demographic in the museum's customer base who tend to be particularly engaged and regular visitors. Roughly 55% were deliberate yet first-time visitors to the museum for personal or academic reasons. The other 40% were curious (but otherwise uninitiated) day visitors to Boscastle who had decided to visit the Museum on a whim. Of all visitors, roughly 7% had engaged with the Museum's marketing materials directly and had cited the installation as at least part of the reason for their visit. Gender demographics were roughly equal. As for demographics of nationality, a large majority (around 80%) of visitors were British nationals, though other nationalities represented included Thailand, the Netherlands, Scotland, the United States and the Republic of Ireland. Age demographics skewed heavily to the adult, with only five children under 18 attending: not surprising, considering that the residency took place in the working week outside of the standard UK school holiday period.

The responses to the installation were extremely varied, and pointedly individual, though certain patterns did emerge. Some found the `masterbeast` 'terrifying', 'uncomfortable', 'unnerving' and 'like the Devil itself'. Some held back from entering the room because they were professedly 'scared', and I was told that dogs sitting with their owners in the courtyard below had started whining when the sound of the installation had drifted down through the open windows. A minority of visitors, both professed believers/'practitioners' and not, had strongly superstitious or seemingly undistanced reactions. One woman refused to come into the room, darkly stating that she would 'never sit in that circle', and left extremely quickly. One man refused to recite the Lord's Prayer as part of a ritual with the `masterbeast`, though latterly explained that this was a tenet of his existing pagan beliefs. Another woman told me that she had always 'felt things', and that she got a 'bad feeling' from the room and the installation, refusing to engage with it at all.

2186 Hutton, Ronald *The Triumph Of The Moon: A History of Modern Pagan Witchcraft*. Oxford: OUP, 2001.

Such visitors represented a minority of recorded responses: the majority had strong, positive and intriguing reactions to the work. Verbal judgements ranged from 'fascinating', 'beautiful' and 'amazing' to 'interesting' and 'excellent', with one man stating that he 'had never seen anything like it'[2187], and another reporting that the entire installation made him 'want to dive right in' to Anne's world. Many people stopped on the threshold of the installation when they saw the `masterbeast`, standing open-mouthed, whispering, cooing, and watching the simulation from a distance until they felt ready to approach: such an interval ranging from a few seconds to three or four minutes.

Over three-quarters of the visitors chose to read the textual material before interacting with the installation, and spent an appreciable amount of time (some more than ten minutes) poring over it. Over half interacted directly with the `masterbeast`, either sitting inside the chalked circle or standing outside it: in each case using their voice, movement and touch as inputs for interaction. Visitors' response to the `masterbeast`'s physical appearance and perceived personality was very diverse: several people said it looked like their pet cat or dog, three separate visitors compared it to a 'tree spirit', another to a horse, and another to a rabbit. A young girl of thirteen said that it 'doesn't look like any animal I know'. Depending on the state of the creature's emotional model and their interactions with it, they characterised the creature as 'apprehensive, but wanting to be stroked', 'happy', 'relaxed', 'scared', 'waiting for visitors', 'wanting to commune, to communicate', 'pretending to be scary', 'strong', 'cheeky', 'playful' or 'gentle'.

Of those who did interact directly with the `masterbeast`, a variety of approaches, techniques and self-narrations were in evidence[2188]. When reading in the supplementary materials that the 'spyrit' liked to have its nose rubbed many visitors chose to do so, some for many minutes on end. Numerous personal variations were in evidence: some stroked slowly, and others fast (with one woman remonstrating her partner to not 'muss him, be gentle'). Some experimented with different parts of their finger on the touchscreen, others shushed or spoke encouraging words to the

2187 See Appendix #9, Figure 13u.
2188 See Appendix #9, Figures 13a – 13w.

'spyrit'[2189]; many exclaimed that it demonstrably preferred one phrase or touch over another. Many visitors tried stroking the creature in other places to elicit different responses. One woman told me that, in stroking the creature and observing it initially shrinking away from her approaching hand, yet slowly becoming more confident, she was reminded most of her experiences with stray cats, and the process of gaining their trust. One man chose to sit in front of the 'spyrit' for nearly ten minutes, eyes shut and legs crossed, matching his breathing to the simulated creature's own, slow breaths[2190]. When they left, many visitors would say goodbye to the `masterbeast`, and even admonish their partners for not doing so themselves. One woman, who saw the 'spyrit' move forward on the screen when she went to leave, remarked with evident delight that, because they had treated the simulation kindly, 'he [was] trying to follow'[2191].

Many visitors voluntarily used soft tones, and were visibly reluctant to use the sharp and authoritative voice encouraged in the sample ritual material. Some stated that they 'felt bad' when they pulled out the 'spyrit's horns or ears as part of the same ritual process; especially when observing the corresponding emotional change onscreen. Several (both adults and children) verbally apologised to the `masterbeast` several times, and used the nose-rubbing interaction as a means to calm and ameliorate the simulation after such woundings. When (upon occasion) the distressed 'spyrit' retreated into the simulated darkness, almost all of these visitors stated that it was 'their fault' that this had occurred. Other visitors relished shouting at the 'spyrit' to command it to 'begone' and 'return', and laughed with surprise and disgust when hurting or disfiguring the 'spyrit'.

One of the most striking features of the residency was the number of visitors who related their visit to the installation to their own experiences and backgrounds, and their evident eagerness to discuss this with me. Visitors from Thailand and the Ukraine both engaged me in detailed, lengthy discussions about traditions of supernatural spirits, witches and healers from their own cultures, and how the `masterbeast` reminded them of those traditions. Those visitors who had a background in computer programming were eager to comment upon and learn more about

2189 See Appendix #9, Figure 13d.
2190 See Appendix #9, Figure 13m.
2191 See Appendix #9, Figure 13b.

the codebase behind the `masterbeast`, and offer suggestions and praise for the technical effort that had gone into designing the underlying systems. Many of those visitors who identified as pagan were keen to offer their own perspectives and opinions upon my interpretation of belief, ritual practice and magic, especially considering the computational elements of this interpretation. One particularly engaged Dutch visitor, a tarot reader, was interested to discuss the role of emotion and personal perspective in magical practice, and about the challenge of using such perspectives and emotions with a computational partner: a challenge which, in his view, I had gone some way to resolving[2192].

I consider the MWM residency a successful illustration-in-action of many of the concepts at the centre of this thesis: serving as an example of computational characterisation that was (at least by my own measures) resonant with its audience. However, it was not without its issues. A minority of visitors to the installation did not engage with the experience: some would drift into, and then swiftly out of, the room, without engagement, and those who did stop for a few moments told me explicitly that the installation was 'not their kind of thing': others explicitly stated that it was the pressure of 'performing', whether observed or not, in a public exhibition that was the main deterrent. For others, the complexity of the simulation, the relative density of the storyworld and its related materials, and the importance of prior engagement on the Project's website, meant that ultimately the installation was just too inaccessible for a casual visitor: one woman even turning to me and asking 'so, what is it we actually do?'

The variety of audience response in museums and galleries, and the difficulty of overcoming the reticence of visitors to participate in performative interpretations is well understood in the literature[2193][2194]. Also at issue is the difficulty of delivering complex narrative experiences in museum environments where, outside the comfort of their own home and in a public arena, a visitor's engagement with installations is 'inevitably controlled, structured and brief'[2195]; particularly experiences like `knole`

2192 See Appendix #9, Figure 13w.
2193 Scott, Susie *et al.* 'Goffman in the Gallery: Interactive Art and Visitor Shyness'. *Symbolic Interaction* 36 (4), 2013, pp.417 – 438.
2194 Scott, Susie. 'Shyness in interactive art galleries and museums: a symbolic interactionist account'. Nordic Sociological Association (NSA) Annual Conference, Oslo, Norway, 2011.
2195 Parry, Ross, 2013, p.

where, (as game designer and installation artist Lea Schonfelder delineates) the complexity of the simulation, and the depth of the fiction, 'need[s] some time to understand them right'[2196]. Other, more mundane issues of accessibility arose, always of concern in art galleries and museums[2197], but particularly at the MWM due to the cramped and narrow passages, small rooms and winding staircases that form part of the centuries-old facilities in which the museum is housed.

While I made the decision for `knole` to be a piece of installation art rather than an item of downloadable media for a number of good reasons (see Conclusion), such issues are perennial for similar works in museums, art galleries and other heritage institutions, and I will continue to explore how to overcome them in my work. Another productive comment may be made about the unavailability of the *Housekeeping* both prior to or during this prototype installation. This unavailability meant that much of the depth of Anne's fiction, and the importance of the instructive interaction between text and simulation (see Chapter 3), was not able to be adequately tested with audiences, and many of the features of the Project remained inaccessible. It was clear that the website and the *Housekeeping* are important, valuable and attractive factors for engaging visitors in the complex installation experience and ameliorating some of the problems mentioned above. Several visitors explicitly asked about the availability of the *Housekeeping*, professing to be eager to read it in the comfort of their own home after or before their visit to the installation: and those who had visited the installation after viewing the Project's website were demonstrably more engaged with the experience. They stayed for longer, experimented with the 'spyrit' more extensively, and derived more resonance than casual visitors. While this gives me confidence that this dynamic between `knole`'s components will work well when fully implemented, it will important to undertake further studies to test this, and to use these studies to provide more detailed conclusions on some of the more advanced theories of this thesis. These include Anne's role as a resonant character, the function of instructional literature in computational narrative experiences, the 'character-as-environment' methodology

2196 Jansson, Mathias *Interview: Lea Schonfelder Makes Games For Adults*, 2011 [Online]. Available at: https://www.gamescenes.org/2011/10/page/3/ [Accessed: 8th August 2018].
2197 Zierbarth, Beth *(eds.) Smithsonian Guidelines For Accessible Exhibition Design*, undated [Online]. Available at: http://www.sifacilities.si.edu/ae_center/design-accessibility.html [Accessed: 8th August 2018].

specifically, and the semantic value of individual visitor experiences in aggregate during a persistent installation (see Appendix 3). An unexpected question arising from the installation was how the role of aesthetic distance (something which my autocosmic theory already questions) is complicated by the specific superstitions, beliefs and psychological phenomena of visitors to institutions which, like the MWM, deal specifically with questions of human spirituality. While this lies outside the remit of the Project, it is certainly an intriguing prospect to investigate.

Despite these issues, the study did represent an encouraging and intriguing first pass on demonstrating the utility of my theories, practice and goals as delineated in this thesis' Introduction and first chapter. It is clear that the majority of the visitors to the installation experienced a resonant, character-led experience through a balance of my systemic, computational authorship and their own imaginative engagement. Their experiences were deeply personal, informed by their own memories and drawing on established aesthetic and non-aesthetic imaginings and practices from their own lives. The 'spyrit' was treated as a complex and coherent person, experienced as a characterful and arresting system both emotionally and intellectually, that visitors were curious to explore using their social faculties; augmented by the thematic environment of the museum, the supplementary materials, and the physical and environmental elements of the installation itself[2198]. Visits to this relatively-small installation often consumed a large portion of the fifteen to thirty minute average of exhibition visit time currently agreed in the literature[2199][2200][2201], and seemed to also fulfil Tilden's classic definition of the 'provocation'[2202] that lies at the heart of good heritage interpretation. It prompted debate and reconsideration, incorporated and honoured personal perspective, and provided an arresting presentation of the themes that lie at the heart of the Museum's work and the Project, both historical and academic: including digital narrative and character, the nature of witchcraft and belief in the past and today, cunning folk and the history of magical practice, the nature of control and power in magic, and the emotional and

2198 Mondloch, Kate, 2014, p.
2199 Falk, John 'The use of time as a measure of visitor behaviour and exhibit effectiveness'. *Roundtable Reports* 7 (4), 1982, pp. 10 – 13.
2200 Davey, Gareth 'What is Museum Fatigue?'. *Visitor Studies Today* 8 (3), 2005, pp. 17 – 21.
2201Hornecker, Eva and Stifter, Matthias 'Learning from interactive museum installations about interaction design for public settings'. *Proceedings of the 18th Australia Conference on Human-Computer Interaction*, Sydney, November 20th – 24th, 2006, pp. 135 – 142.
2202 Tilden, Freeman, 1957.

'intimate supernatural relationships' between cunning folk and their spirits, as one visitor had it. Many visitors explicitly commented on how the work naturally complemented, challenged and enlarged their considerations of the museum, and increased their 'context and understanding' of its materials. One visitor explicitly made a critical link between the interactive, systemic installation and the static 'tableaus' downstairs, arguing that a computational interpretation 'brought it all home to you'.

The study was also useful for providing me with methodological feedback, and allowing me to tweak and modify the installation based on the responses of the audience: an important part of both exhibition and computational design[2203][2204]. The study came quite late in the development of `knole`, and so did not lead to any major structural modification of the work. However, I was able to tweak many elements, including the personality and emotional models, to accomodate my observations of what had resonated with audiences. It was an opportunity to observe what interested visitors (for example, the creature's voice, 'natural' interactions such as grooming, and the 'spyrit's' complex emotional display) and what did not (the necessity to read large blocks of text while interacting with the simulation). Visitor's understandings of the creature's behaviour and personality, and how these understandings informed subsequent interactions, helped me to create a balance between a simulation that behaved unpredictably and opaquely, as a complex simulation of personhood reliant upon engagement with a fictive universe, and an accessible experience that avoided frustration and obfuscation. It also helped me to decide which features of Anne's storyworld it was necessary to materially simulate (in order to provide coherent, resonant responses to the audience's interactions) and which were more productively left to the imagination. More mundanely, it helped me to test the voice recognition features with a range of pitches, voices and tones, to observe the intuitiveness of the touch interface, think through how to instruct visitors in stance and posture during interaction, and to devise technical solutions to the software bugs, performance and responsiveness issues and unhelpful afforance that inevitably arise during software development and artistic practice more generally.

2203 Dean, David, 2004.
2204 Dix, Alan *et al.* 2004.

Appendix 6

Fieldwork Report #4: Skyrim Field Studies

In August 2016 I undertook several sessions of 'digital fieldwork' in order to collect raw data on the features, strengths and weaknesses of one of the major 'circumscribed areas of study'[2205] for this thesis: the virtual environments and 'gameworlds' that form the focus of Chapter 3. I chose for this what I felt to be one of the most representative modern examples of a virtual environment: the 'open world'[2206] model provided by the fantasy roleplaying game *The Elder Scrolls V: Skyrim*.[2207] Not only was this a videogame that had served as a research focus for my participant study (see Appendix 2), it was the latest iteration of a franchise that has 'for decades... refin[ed] the same open world formula'[2208], critically acclaimed for its 'glimpse[s] into another world'[2209], designed computational spaces with which the player can interact through 'naturally paced, non-linear play and explorative flow'[2210]. Despite being nearly seven years old, it is still held up as one of the best examples of 'a rich and varied landscape'[2211] rendered computationally; as close to a characterful, 'resonant' virtual 'place' as any.

Digital and virtual fieldwork – in which virtual environments, rather than real places, are used as sites for data collection – remain an emerging methodology, being pioneered in both the life sciences[2212] and game studies. It provides the 'methodological and methodical groundwork'[2213] for studies into player engagement[2214], archaeological practice[2215], and the dynamics of online communities[2216]. The *Elder Scrolls*

2205 Burgess, Robert *In The Field: An Introduction To Field Research*. Hemel Hempstead: George Allen and Unwin, 1984, p. 1.
2206 Berry, Noah. *Finding The Look Of Open Game* Environments, 2015 [Online]. Available at: https://80.lv/articles/building-open-worlds-with-skyrim-envir-artist/ [Accessed 8th August 2018].
2207 Bethesda Softworks, 2011.
2208 *The best open world games | PC Gamer*, 2018 [Online]. Available at: https://www.pcgamer.com/best-open-world-games/ [Accessed 8th August 2018].
2209 Ibid.
2210 Berry, Noah 2015.
2211 Kelly, Andy *GTA V to Skyrim: the 10 most beautiful walks in gaming*, 2014 [Online]. Available at: https://www.theguardian.com/technology/gallery/2014/may/05/gta-v-to-skyrim-the-ten-most-beautiful-walks-in-gaming [Accessed 8th August 2018].
2212 Taylor, Rex N *Virtual Fieldwork Project* [Online]. Available at: http://visualisation.soton.ac.uk/ [Accessed 8th August 2018].
2213 Heidibrink, Simone *et al*. 'Venturing Into the Unknown: Methodological Reflections on Religion and Digital Games, Gamers and Gaming'. *Heidelberg Journal of Religions on the Internet*, 7, 2015.
2214 Miller, Kiri, 2008.
2215 Reinhard, Andrew *Archaeogaming: An Introduction to Archaeology in and of Video Games*. Germany: Berghahn Books, 2018.
2216 Haverinen, Anna *Digital Death: Online Mourning Rituals and Practises*. London: Routledge, 2017.

series, and in particular their expansive and dynamic landscapes, are frequently used as destinations for digital fieldworkers with a variety of objectives. They have been used to study cultural presence[2217], conduct geographical analysis[2218] and forward demographic theories[2219], to name but a few. I had my own, specific objectives in coming to *Skyrim*: to directly observe and interact with its virtual environment in order to study and critique its computational systems and aesthetic representations, as well as my own imaginative engagement with them, in light of the theories put forward in this thesis. Additionally, I wanted to provide direct evidence of the paucity of resonant direct characterisation in such environments, and use this data as a template for my own autocosmic design philosophy: designing a character using the tenets of environment design, such as those employed in *Skyrim,* in order to capitalise on those environment's resonant effects.

I installed the base *Skyrim* game alongside several popular fan-produced modifications. Modifications are an enormously important factor in the success (and thus, the resonance) of the *Elder Scrolls* franchise[2220]. They are officially sanctioned by the game's designers, and so ubiquitous to most player's experience (particularly since becoming available for console versions of the game) that it seemed disingenuous to exclude them from my study in favour of some idealised 'vanilla' design (as it is often called). This is especially relevant considering the popularity and range of modifications which directly change or improve the landscape or environment of Skyrim, the titular virtual environment in which the game takes place.[2221]

As well as installing modifications which improved the appearance of the game's textures[2222], added new environmental effects such as shooting stars[2223], and wove into the game complex new systems for

2217 Champion, Erik *Social Presence and Cultural Presence in Oblivion,* 2007 [Online]. Available at: https://www.academia.edu/1003317/Social_Presence_and_Cultural_Presence_in_Oblivion [Accessed 8th August 2018].
2218 Hirschman, Jacob *Geography of Skyrim*, 2012 [Online]. Available at: https://geoskyrim.blogspot.com [Accessed 8th August 2018].
2219 Appleton, Conor and Morris, Jake 'Scaling Skyrim – a case study on the population of Solstheim'. *Journal of Interdisciplinary Science Topics*, 2018.
2220 Champion, Erik. *Game Mods.* Pittsburgh: ETC Press, 2012.
2221 Scott, Robin. *Skyrim Mod* Categories, 2018 [Online]. Available at: https://www.nexusmods.com/skyrim/mods/categories/ [Accessed 8th August 2018].
2222 Laast *Pure Waters*, 2014 [Online]. Available at: https://www.nexusmods.com/skyrim/mods/1111 [Accessed 8th August 2018].
2223 Isoku *Shooting Stars,* 2013 [Online]. Available at: https://www.nexusmods.com/skyrim/mods/25022 [Accessed 8th August 2018].

simulating enviornmental effects such as hypothermia and fatigue[2224], I also added a modification which allows the player to keep an in-game journal[2225], which I used to record my observations[2226]. In total I spent four in-game days (equivalent to roughly 5 hours of playtime) exploring Skyrim's varied environments; spaces both rural and urban, wild and cultivated, populated and unpopulated. I paid particular attention to how information about the 'character' of the environment – its history, secrets and dangers – was revealed through exploration, systemic reactiveness and player observation, and how both systemic and non-systemic components of the environment contributed to my imaginative engagement in their own manner[2227].

In general, my approach to the exercise was not to engage in the more granular activities within the landscape that form the game's primary narrative thrust, such as undertaking quests, engaging in combat or talking to characters. Instead, I attempted to make my journey across *Skyrim* one of direct engagement – indeed, even interpersonal interaction - between myself and the environment as a whole. Constantly I tried to think of Skyrim as a single entity, rather than as a collection of overlapping systems, or disparate provinces and towns; I tried to maintain that 'paradigmatic... unity'[2228], that animistic personification, which forms the basis of human autocosmic engagement with place (see Chapter 3). I tried to witness the numerous designed systems that make up the landscape-as-whole as multiple vectors of communication from a coherent individual, and by which that individual could be known, and responded to. This individual is the complex, resonant place-person who/which, as I argue in Chapter 3, is the most resonant character in the entire gamespace of *Skyrim*[2229].

My sojourn in *Skyrim*, and the primary data that I gathered, was my own attempt at the mindful, engaged journeys in virtual worlds that form the subject of much of my reading for Chapter 3; journeys which themselves are emulations of psychogeographic and Romantic practices

2224 Chesko *Frostfall – Hypothermia Camping Survival*, 2016 [Online]. Available at: https://www.nexusmods.com/skyrim/mods/11163 [Accessed 8th August 2018].
2225 LordConti2 *Take Notes – Journal of the Dragonborn*, 2014 [Online]. Available at: https://www.nexusmods.com/skyrim/mods/48375 [Accessed 8th August 2018].
2226 See Appendix #9, Figure 5c.
2227 See Appendix #9, Figures 5a – 5d.
2228 Margolin, Uri. 'Introducing and Sustaining Characters in Literary Narrative: A Set of Conditions'. *Style* 21 (1), pp.107 – 124, p.115.
2229 See Appendix #9, Figure 5e.

with real-world landscapes, and part of the same autocosmic spectrum of interaction with place that defines the human condition.

Appendix 7
Selected Links

Most of the supplementary material of Project `knole` which is not feasible to include in this thesis can be found at the following links. In each case, I have endeavoured to provide the most stable and canonical link.

http://bonfiredog.co.uk/knole
The portal webpage for the entire project, which serves as the ideal introduction to the work for the 'implied' audience to which it is addressed.[2230] It includes both theoretical and narrative context for the project, links to all of the project's other outputs and online presences, downloads of the *Housekeeping* and this thesis, as well as providing the ability to sign up for email updates about the project and its scheduled installations.

http://twitter.com/rob_sherman
My Twitter account (now deactivated but archived), which functioned as a continuous development diary for the project, as well as an avenue to seek advice and critique from other artists and academics.

https://www.zotero.org/bonfire_dog/items/collectionKey/SDA3R9CK
A complete and 'live' bibliography for the project, hosted on the open-source referencing service Zotero.[2231] Please note that this bibliography is not completed to the specification of Bath Spa University's Numeric Referencing System. [2232]

2230 Iser, Wolfgang *The Implied Reader: Patterns of Communication in Prose Fiction from Bunyan to Beckett*. Baltimore: The John Hopkins University Press, 1978, p.3
2231 Roy Rosenzweig Center of History and New Media *Zotero*, 2018. [Online] Available at: http://zotero.org [Accessed 25th August 2018].
2232 Bath Spa University *BSU Numeric Referencing System*, 2018. [Online] Available at: https://www.bathspa.ac.uk/media/bathspaacuk/library/policies-forms-and-documents/Numeric-referencing-guide.pdf [Accessed 25th August 2018].

http://bonfiredog.co.uk

My personal website.

http://bonfiredog.co.uk/bonfog/tag/knole/

A collection of development posts from my blog about Project `knole`.

https://github.com/bonfiredog/knole-latest

The Github repository for the Project. This repository includes drafts of this thesis, collections of notes and 'offcuts', the assets for the Project's website, screenshots and prototype code, iterative drafts of the *Housekeeping* and the source files for the final `masterbeast` installation. It also plays host to the illustrative videos, images and animations of the `masterbeast` that I use to augment my self-reflection throughout this thesis.

https://app.researchfish.com/awards/viewdetails/0?orderby=organisation&filter=AHRC-1672384

The Researchfish profile for this project.[2233] It includes all of the project's academic and non-academic outcomes and impacts, reported on an annual basis for up to three years after the work is completed. This profile is a stipulation of my funding from the Arts and Humanities Research Council.[2234]

2233 Research Fish Limited *researchfish(tm)*, 2018. [Online]. Available at: https://www.researchfish.net/ [Accessed 25th August 2018].
2234 Arts and Humanities Research Council *AHRC*, 2018. [Online]. Available at: http://ahrc.ac.uk [Accessed 25th August 2018].

Appendix 8

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Appendix 9
Illustrative Thesis Figures

These videos, images and executable files are intended as supplementary, illustrative material to the main body of this thesis, referenced throughout. They are stored in a secure repository on Github, a well-established code repository website. If this repository is ever compromised, I will endeavour to make the files available through some other source. Otherwise, the Internet Wayback Machine[2235] may have a copy of the files.

Various prototypes, screenshots and other illustrative material can be found at the following permalinks:

https://github.com/bonfiredog/knole-latest/tree/master/notes%20and%20addenda

https://github.com/bonfiredog/knole-latest/tree/master/masterbeast/prototypes

The permalink for the folder containing the illustrative figures is **https://github.com/bonfiredog/knole-latest/tree/master/notes%20and%20addenda/thesis_figs**, and the individual files are named as follows:

Figure 1 – An image of the room setup for my videogame play study, as described in Appendix #2 of this thesis.

2235 *The Internet Wayback Machine*, 2020 [Online]. Available at: http://archive.org [Accessed 20th February 2020].

Figures 2a and 2b – Initial character studies for the creature at the heart of Anne's narrative, as realised by artist Gus Storms[2236].

Figures 3a - 3g – Screenshots from a prototype created as part of the `masterbeast`'s development. In this prototype, the moles which roam the creature's body are controlled by an artificially-intelligent 'Moleherd': a symbolic, parasitic substitute for Simon Awlbatch, the focus of Anne's impotent frustrations with the natural world. This 'Moleherd' could control the moles movement, traversing the creature's skin like Awlbatch traversed the moor. In initial designs for `knole`, this character played a much larger role in the ritualistic interaction between audience and 'beest'.

Figure 4 – The executable Windows file for the above prototype.

Figures 5a - 5d – Screenshots from my *The Elder Scrolls V: Skyrim* environment study, as described in Appendix #6. In particular, Fig 5c shows the diary that I used to record my observations while in-game.

Figure 5e – A text file export of the journal kept as part of the study described in Appendix #6.

Figure 7 – A demonstration version of the 'Temple' functionality of the creature. Inspired by a smartphone locking interaction, this became an important part of interacting with the 'spyrit' – and, by extension, of Anne's flawed, circumstantial cosmology.

Figures 8a – 8c – Various iterations of the installation housing, from initial design to final prototype.

Figures 9a and 9b – Early prototypes for the creature, including physics-based interaction and fur generation.

Figure 10 – A demonstration of the use of Microsoft Oxford Project's emotion recognition API as a key part of the interaction with the creature[2237].

2236 Storms, Gus, *Gus Storms*, 2020 [Online]. Available at: http://gusstorms.com [Accessed 20th February 2020].
2237 cite

Figure 11 – A demonstration of an advanced liquid engine, not used in the final version of the `masterbeast`.

Figure 12 – A demonstration of an early version of a fine-control vocal engine for the creature, not used in the final version of the `masterbeast`.

Figures 13a – 13w – Images and videos of audiences interacting with the prototype version of Project `knole` at the Museum of Witchcraft and Magic in Boscastle, Cornwall, as described in Appendix #5.

Figure 14 – A PDF of the Google Forms exit questionnaire given to participants in my videogame study, described in Appendix #2.

Figure 15 – A playable demonstration of the 'cellar couple' functionality, as described in Chapter 3.4.