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

Project knole

An Autocosmic Approach To Authoring Resonant Computational Characters

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A thesis submitted in partial fulfillment of the requirements
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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

Project `knole`, consisting of this thesis and a mixed reality installation artwork centred around a computational simulation, is a practice-based response to the question of how a character in a work of computational narrative art might maintain their defining quality of dynamic agency within a system (arguably one of the key potentials of the form), while achieving the ‘resonant’ qualities of characters in more materially-static artforms.

In all aspects of this project, I explore a new design philosophy for achieving this balance; between the authorship of a procedural computational system, and the ability of that system to ‘resonate’ with the imagination of an audience. This philosophy, which I term the ‘autocosmic’, seeks inspiration for the curation of audience response outside the obvious boundaries of artistic discipline, across the wider spectrum of human imaginative engagement; examples often drawn from mostly non-aesthetic domains.

As well as defining the terms ‘resonance’ and ‘autocosmic’, and delineating my methodology more generally, this thesis demonstrates how the ‘autocosmic’ was employed within my creative work. In particular, it shows how some of the perennial problems of computational character development might be mediated by exploring other non-aesthetic examples of imaginative, narrative engagement with personified systems. In the context of this project, such examples come from the historio-cultural relationship between human beings and the environments they inhabit, outside of formal artistic practice.

From this ‘autocosmic’ launchpad, I have developed an artwork that starts to explore how this rich cultural and biological lineage of human

social engagement with systemic place can be applied fruitfully to the development of a 'resonant' computational character.

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Guidance For The Reader

Given the interdisciplinary nature of this thesis, interested parties may wish to approach its findings in a number of ways.

The flow of the work as it is written is designed primarily to suit a general reader: beginning with definitions of the nominal terms used in my investigation, followed by a description of the problem space, my proposed methodology and then an exploration of how that methodology was implemented. A short conclusion summarises my findings, and makes recommendations for future investigation. This is supported by a number of appendices, which include detailed descriptions of field work, case studies and literature views which ramify my thesis, but which would break the rhetorical flow of the main text.

Other readers, with different objectives, may wish to read only part of the thesis, or read it in a different order entirely. This introductory section is designed to therefore signpost how to access these different materials.

- The work's **Introduction** provides an overview of the artistic practice at the heart of the work, as well as a summary of the major arguments, key findings and structure of the thesis. It also provides nominal definitions for 'resonance' and 'fictional character', two of the key concepts in my work.

- **Chapter 1** further defines the term 'computational art', and reviews the opportunities, and challenges, for character-led narrative works in this medium to be both truly 'resonant' and computational; the main 'problem statement' of this project.

- **Chapter 2** provides further literature review of existing approaches to the challenge of ‘resonant’ characterisation in computational art, before establishing the interdisciplinary theoretical basis for the concept of the ‘autocosmic’; a new design philosophy for approaching this challenge.

- **Chapter 3** is the chapter in which I explore in detail my design process, my implementation of the ‘autocosmic’ philosophy, and the resultant artistic artefact. Specifically, it addresses how my work uses the relationship between humanity and its containing environments and landscapes as a template for curating audience interactions with works of computational art; with particular reference to contemporary environmental design in works of computational art like videogames. This address has four major elements: an exploration of historical human/environment relationships pertinent to the fictional context that I have chosen for my work; a description of how I built my computational characters using the precepts of digital environment design; how I used the concepts and narrative heritage of ‘the paratext’ and ‘the intertext’ to supplement my digital design practices; and finally, how these elements came together through the paradigm of ritual which was chosen as the major interactive metaphor for the work.

- The thesis’ **Conclusion** discusses the successes of the project, as well as identifying areas that require further development and study.

* * * * *

The **Appendices** contain material that is referenced throughout the main body of the thesis: studies, apologia and literature reviews pertinent to the project, but not necessarily part of its main argument.

- **Appendix 1** is a detailed case study of the project’s major audience test, as an artistic installation at the Museum of Witchcraft and Magic in Cornwall, England, in July 2018.

- **Appendix 2** is a description of a study I undertook with a literary reading group in 2016, as part of my efforts to properly define the relationship between an audience, a work of fiction and its characters;

- **Appendix 3** is a description of a study that I undertook with videogame players, to garner first-hand observations of the audience's relationship with computational characters; focussing on both similarities to, and differences from, those of the reading group studied in Appendix 2.

- **Appendix 4** is an explanation, by way of literature review, of the difficulties applying my particular thesis of 'resonance' and 'autocosmic' design to both non-player and player characters in works of computational art.

- **Appendix 5** discusses the advantages and disadvantages of focussing on one particular form of computational art (the videogame) rather than others with which my work also shares certain features.

- **Appendix 6** is a description of a session of 'digital fieldwork' that I undertook in the videogame *The Elder Scrolls V: Skyrim*, in order to understand how computational environments (such as 'open worlds' in videogames) trigger affective, even interpersonal, reactions in players.

- **Appendix 7** is a collection of Internet links to other resources pertinent to this project, including its Github repository.

- **Appendix 8** contain the project's acknowledgments.

- **Appendix 9** provides descriptive captions for all of the illustrative figures in this thesis: some reproduced in the body of the text, others available online at the provided link.

Given the diverse and diffuse range of influences and citations on which this work draws – and the relevance of particular citations across multiple sections of the thesis - I have limited direct, footnoted citations to explicit quotations and references only. The **Bibliography**, at the end of the thesis, contains all the consulted material for this project, organised alphabetically by subject.

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

Introducing Project knole

On 19th August 1758, at six o'clock in the evening, a bell sounded in the eaves of Mr. Elijah Knole's cotton mill, precisely as and when it sounded every day. The wealthy Methodist had built his mill on the high gritstone moors on the western outskirts of the English city of Sheffield, seeking to exploit the flow of the river Night as it tumbled from the moor's heights. Though he was something of a pioneer of mechanisation, Mr. Knole's 'stations' - which spun his cotton into thread, and wove that thread into cloth - were primitive, and still needed human operators. The rain-lashed moors were sparsely populated, and so Mr. Knole had built several new settlements to tempt prospective workers. When the final bell struck, the sixteenth time it had sounded since dawn, as it measured out the day shift, a stream of people left their 'stations' and began the short, uphill commute to these newly built hamlets.

Amongst them was a young woman named Anne Latch, returning with her husband John to their home in the village of Nighthead. Their Spartan-yet-sturdy gritstone cottage had been built by Anne's father, Caleb, a mason who helped to build many of Mr. Knole's model communities. Caleb had died when Anne was a girl, leaving her raising to his neighbours, Sarah and Matthew Marchand. When she was old enough she had joined them in working at the mill, and there met John - each subsequent day's passing measured out by the sounding of those bells.

It was raining, as it often did on the Derbyshire moors: there was little chance that evening of spying the comet, or 'hairy star', that had been predicted to appear across the country that year by the astronomer

and physicist Edmond Halley. Like many, Anne was hurrying home after a long shift, eager to shut herself indoors. Unlike many of her peers, however, fearful of the baleful influence of the comet, or the 'medley of supernatural figures'¹ which many still believed to lurk out on the moor, Anne's own fears were private and unexpressed; her personal universe populated by more mundane horrors.

Reaching the door ahead of her husband, Anne rushed straight into the kitchen – the quietest room, deep in the house, and the warmest; and thus her favourite. She knew its dimensions so well that, as she lit candles and carefully removed her soaked shawl, she instantly noticed that something was awry.

In the mortar of the ash-lared wall was a thin crack, about as tall as a mousehole, and emitting a pale glow. It had not been there that morning. She lowered herself onto her aching knees, and looked inside. A pair of wan, pupil-less eyes looked back, and from somewhere in that little, glowing darkness came a strong yet unearthly voice: asking politely for a glass of water.

* * * * *

Project *knole*, an original practice-based project of which this thesis is both a component and a formal companion, takes this event as the start of its trajectory into Anne's story. It is a 'frictional tale' (as one contemporary had it) which will engulf the following two years of her life, and bond it, inextricably, with that of the supernatural creature – a creature which Anne comes to call her 'Beest' - that has immured itself in the very fabric of her father's house. It is a narrative that sees Anne emancipate herself from her work at the mill, using the 'Beest' to transform into a 'cunning woman'; a breed of magical healer, soothsayer

¹Wilby, Emma 'The Witch's Familiar and the Fairy in Early Modern England and Scotland'. *Folklore* 111 (2), 2000, pp. 283 – 205, 2. 301.

and 'shrewd entrepreneur'² who throughout British history has tended to the superstitions, quarrels and psychosomatics of the populace.

With the 'Beest' as her 'familiar spirit'³, Anne fabricates a new, syncretic view of the world, drawing both on her peripheral understanding of new scientific advances and her own inescapable preoccupations. This 'new, inosent Theory of the world', as it comes to be known, catapults her into the public eye; individuals from all strata of society come to visit with her, and to pay her for the use of her creature's powers. Her new fame brings trouble, as well as renown. By the August of 1760, amid lurid stories of murder, bestiality and witchcraft, Anne – by now 'much-trafficked and feared' – is forced to flee Nighthead, her father's house, and the 'Beest' that brought this questionable fortune to her doorstep.

* * * * *

Anne Latch's tale is not just 'frictional', of course, but 'fictional' as well. While elements of her 'storyworld'⁴ impinge on the historical record, there are many 'points... [of] divergence'⁵; neither Anne, her husband John, the village of Nighthead nor many of the other narrative elements ever truly existed. The materials of the project, while presenting themselves as primary sources, are most properly considered 'counterfactual', pseudepigraphical, metafictional, semi-epistolary, or works of 'fantasy history'⁶. Hers is a specific and 'non-actual'⁷ version of 18th century England, occupying the common narrative space which

²Davies, Owen 'Cunning-Folk in England and Wales during the Eighteenth and Nineteenth Centuries'. *Rural History* 8 (1), 2008, pp. 91-107, p. 94.

³Wilby, Emma, 2000, p.301.

⁴Ryan, Marie-Laure *Storyworld across Media: Toward a Media-Conscious Narratology*. Nebraska: UNP, 2014.

⁵Willis, Connie *Blackout*. USA: Ballantine, 2010.

⁶Morse, 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.

⁷Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions'. *Style* 21 (1) 1987, pp.107-124, p. 110.

Maître delineates as 'an oscillation between could-be-actual and could-never-be-actual'⁸.

Of course pseudepigraphy, the 'blur[ring of] the boundaries between the fictional and real'⁹, the 'reauthoring process of "natural" into fictive discourse'¹⁰ and the use of non-traditional structures, are all well-established techniques across the history of narrative experience, and Project *knole* is no different. Like any work of fiction, it uses rhetorical, narrative and aesthetic techniques to explore and provoke ideas at many resolutions. At the most coarse-grained, it is concerned with the 'long eighteenth century'¹¹ itself: a tumultuous era which transformed the nature of many social, political and economic realities in Europe and beyond, including gender relations, the law, science, art, philosophy, class, the press and working life. It explores some elements of these philosophies and social practices in more detail than others; most notably, the nature of religious belief and superstitious practice in 18th century England through the traditions of 'cunning folk' and 'low magic'¹², familiar spirits, demons and fairies.

Such formal themes are complemented by, and parsed through, Anne's personal story; an example of how the practice of narrative (like the practice of history), most properly focuses on the 'subjectivity of individuals'¹³ 'making concrete choices in given circumstances'¹⁴ 'in [a] certain place... in certain times'¹⁵. Through Anne Latch, her 'Beest', and some of the other persons that intrude on their small, indoor universe, *knole* explores not just historical contexts, but human contexts, as well:

⁸Ryan, 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.

⁹Benford, Steve and Giannachi, Gabriella. 'Interaction As Performance'. *Interactions* 19 (3), 2012, pp. 38-43, p. 38.

¹⁰Beebee, Thomas O. 'Introduction: letters, genealogy, power'. In: Beebee, Thomas O. (eds.) *Epistolary Fiction in Europe, 1500 – 1850*. Cambridge: CUP, 1999, pp. 1 – 17, p. 8.

¹¹Davies, Owen and De Bleacourt, Willem *Beyond the Witch Trials*. Manchester: Manchester University Press, 2004.

¹²Davies, Owen, 2007.

¹³Neithammer, Lutz *Posthistoire*. London: Verso, 1992, p. 149

¹⁴Greenblatt, Stephen 'Resonance and Wonder'. *Bulletin of the American Academy of Arts and Sciences* 43 (4), 1990, pp. 11-34, p.30.

¹⁵*Inner Lives Project: Histories From Within*, 2018 [Online]. Available at: <https://innerlives.org/about/> [Accessed 18th August 2018].

contexts of love, toil, faith, misunderstanding, jealousy, loneliness, fear, revenge and hubris. Anne and her cohort are merely a handful of examples of the vast population of fictional characters in human culture that become, through their narratives, tools of 'communication and understanding'¹⁶; lives put to work in 'texts'¹⁷ for some communicative 'intent or purpose'¹⁸.

As a thesis, however – beyond its role as a fictional narrative – the project is not merely concerned with historio-social detail. *knowle* is not only a work *containing* fictional characters, whose narrative is *about* those characters' lives and times. It is a work concerning the very nature of 'fictional character's themselves, and the methods of their construction: namely, how they might be produced to a higher 'quality', particularly in works of digital, or computational, narrative art.

* * * * *

Before I continue, I will refine my chosen definitions of these two terms, 'fictional character' and 'quality'. The former, despite a seeming commonality in everyday discourse, 'is a matter of long-standing debate'¹⁹, exposed to the vogues and peccadilloes of literary movements, philosophical discourse and wider social contexts. From its formal origins in the dramatic and civil culture of Ancient Greece and Aristotle's concept of *ethos*²⁰, there remains what Keen identifies as a fundamental split in understanding of the concept²¹.

On one side of the debate stands what might be called a 'classical' or formalist position, borne out of that Hellenistic scholarship, and

¹⁶Oatley, 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.

¹⁷Lotman, Yuri *The Structure of the Artistic Text*. Ann Arbor: University of Michigan Press, 1977.

¹⁸Dean, David. *Museum Exhibition: Theory and Practice*. London: Routledge, 1994, p. 4.

¹⁹Jannidis, Fotis, 'Character' *the living handbook of narratology, 2013 [Online]*. Available at: <https://www.lhn.uni-hamburg.de/node/41.html> [Accessed: 20th October 2019].

²⁰Felski, Rita. 'Introduction'. *New Literary History*, 42 (2), 2011, pp.v-ix, p. v.

²¹Keen, Suzanne 'Reader's Temperaments and Fictional Character'. *New Literary History* 42 (2), 2011, pp.295 – 314, p. 295

taken up in recent times by scholars such as the American New Critics²², Russian Formalists²³ and certain feminist rhetorics. It is a view that defines characters not in terms of their personhood, but in terms of their role within a text. By such a definition, characters are merely 'humanised outcroppings'²⁴, 'clusters of... semes'²⁵ perceived as structural and 'functional categor[ies]'²⁶ or 'effect[s]'²⁷. On the other side is what has been called a 'commonsensical' view of character²⁸, as complete fictional *persons* distinguishable from their containing narratives. As well as being a position commonly taken by 'naive' audiences towards narratives²⁹, the position has found its scholarly foundations as part of the 'post-classical'³⁰ shift across the humanities³¹. 'Character-focussed criticism'³² thus privileges 'the world of individuals'³³ and 'existents'³⁴ over structural considerations; characters as perceived 'intentional agents'³⁵ rather than rhetorical devices or structural emergences. To such scholars characters are, in a very definite and precise way, *persons* of their own.

It may seem an academic nicety to agonise over these two positions, but the core question – whether or not a character can be conceived of as a distinct person, real or not – is an important distinction for this thesis. It is a distinction that decides not only how characters of 'quality' can be developed through practice (as this thesis

²² Richards, Ivor Armstrong *Practical Criticism*. London: Kegan Paul, Trench, Trubner, 1930.

²³ Propp, Vladimir *Morphology of the Folktale*. Texas: University of Texas Press, 1968.

²⁴ Bradbury, Malcolm 'Character'. In: Childs, Peter and Fowler, Roger *The Routledge Dictionary Of Literary Terms*. London: Routledge, 2006, p.23.

²⁵ Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions', p. 107.

²⁶ Ibid, p. 107.

²⁷ Jannidis, Fotis *Character*, 2013 [Online]. Available at: <http://wikis.sub.uni-hamburg.de/lhn/index.php/Character> [Accessed: 18th August 2018].

²⁸ Ryan, Marie Laure 'Kinds of Minds: On Alan Palmer's "Social Minds"'. *Style* 45 (4), 2011, pp. 654 – 659.

²⁹ Keen, Suzanne 'Reader's Temperaments and Fictional Character'. *New Literary History* 42 (2), 2011, pp.295 – 314, p. 295

³⁰ Mani, Inderjeet *Computational narratology*, 2013 [Online]. Available at: <http://www.lhn.uni-hamburg.de/article/computational-narratology> [Accessed 18th August 2018].

³¹ Felski, Rita 2011, p. v.

³² Currie, Gregory 'Narrative and the Psychology of Character'. *The Journal of Aesthetics and Art Criticism*, 2009, pp. 1 – 12, p. 61 – 71, p. 61.

³³ Martinez Bonati, Felix *Fictive Discourse and the Structures of Literature: A Phenomenological Approach*. New York: Cornell University Press, 1981, p. 3.

³⁴ Ryan, Marie-Laure, 2014.

³⁵ Mar, Raymond A. and Oatley, Keith, 2008, p. 3.

explores), but also what that 'quality' is, and how it is arrived at through 'judgements of relative value [and] evaluation'³⁶ - that is, what Shinkle calls the 'concern... with what cultural forms... do'³⁷, and how well they do it.

The component definitions of this 'quality', across many relevant critical fields, are strikingly diverse. Various, fictional characters 'of quality' are defined as 'evocative'³⁸, 'provo[cative]'³⁹, 'sympath[etic]'⁴⁰, 'memorable'⁴¹, 'rich'⁴², 'engaging'⁴³ and 'transporting'⁴⁴. The reading group I studied as part of my research into this topic (see Appendix 2) offered similar definitions of 'believability', 'well-drawnness' and 'plausibility'; of behaving 'realistically', of avoiding 'clunkiness' and the treatment of characters as mere 'devices'.

It is the 'post-classical' position of audience reception theory⁴⁵ which reveals the unifying theoretical factor behind the above remarks. While originating in classical concepts of narrative in drama and literature⁴⁶, this model has spread to cinema⁴⁷, the visual arts⁴⁸, theatre studies⁴⁹, exhibition design and museum studies⁵⁰ and is firmly part of

³⁶ Layton, Robert *The Anthropology Of Art*. Cambridge, CUP, 2009, p.18.

³⁷ Shinkle, Eugenie 'Videogames and the Digital Sublime' In: Karatzogianni, Athina and Kuntsman, Adi (eds.) Germany: Springer, 2012, pp. 94 – 108, p. 95.

³⁸ Turkle, Sherry *The Second Self: Computers and the Human Spirit*. Massachusetts: MIT, 2005, p. 19.

³⁹ Tilden, Freeman *Interpreting Our Heritage*. North Carolina: University of North Carolina Press, 1957, p.152.

⁴⁰ Oatley, Keith 1994, p.53.

⁴¹ Boswijk, Albert *et al. The Economy Of Experiences*. Amsterdam: European Centre for the Experience and Transformation Economy, 2012.

⁴² 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.

⁴³ Heidibrink, Simone *et al. 'Theorizing Religion in Digital Games. Perspectives and Approaches'*. *Online Heidelberg Journal of Religions on the Internet* 5 (1), 2014.

⁴⁴ Rain, Marina *et al. 'Adult attachment and transportation into narrative worlds'*. *Personal Relationships* 24 (1), 2017, pp. 49 – 74, p.49.

⁴⁵ Holub, Robert C. *Reception Theory: A Critical Introduction*. London: Methuen, 1984.

⁴⁶ Prince, Gerald *Reader*, 2013 [Online]. Available at: <http://www.lhn.uni-hamburg.de/article/reader> [Accessed: 8th August 2018].

⁴⁷ Hirschman, Elizabeth C. 'Applying Reader-Response Theory to a Television Program'. *Advances in Consumer Research* 26, 1999, pp. 549-554.

⁴⁸ Bal, Mieke *Reading Rembrandt: Beyond The Word-Image Opposition*. Amsterdam: Amsterdam University Press, 2006.

⁴⁹ Laurel, Brenda *Computers as Theatre*. Boston: Addison-Wesley, 1993.

⁵⁰ 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.

the 'subjective turn' more broadly⁵¹. 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 audience⁵²; a phenomenon originating in a representative text, but not constrained by it. The theory shows how the reception of a text by an audience leads to an imaginative galvanisation and extrapolation of the source material, an 'aesthetic engagement'⁵³ actively constructing characters into subjectively-complete persons within a 'temporarily shared social reality'⁵⁴. This reality is subject to many individual, 'culturally and temporally specific'⁵⁵ influences, including the audience's personal emotions and memories⁵⁶, their temperaments⁵⁷, 'identities'⁵⁸, personal 'schemas' of information about the world⁵⁹, and any 'interpretative communities'⁶⁰ of which they may be a part. Indeed, it also includes those 'metareferential'⁶¹ elements of the work; that is, those elements which signal that it is a constructed work of narrative rather than an objective reality, and allow the audience to navigate that construction through their 'media knowledges'⁶². To this theory, narrative is first and foremost a 'set of cognitive operations'; an experience rather than a text⁶³.

⁵¹Hiebert, Dennis "'The Massive Subjective Turn": Sociological Perspectives of Spirituality'. *Journal of Sociology & Christianity* 8 (2), 2018, pp. 55 – 75.

⁵²Iser, Wolfgang 'The Reading Process: A Phenomenological Approach'. *New Literary History* 3 (2), 1972 PP.279 – 299, p. 298.

⁵³Berleant, Arnold 'What Is Aesthetic Engagement?', *Contemporary Aesthetics*, 2013 [Online]. Available at: <https://contempaesthetics.org/newvolume/pages/article.php?articleID=684> [Accessed: 20th October 2019].

⁵⁴Rommetveit, 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.

⁵⁵Alexander, Marc and Emmott, Catherine, 2014.

⁵⁶Miall, David S. 'Anticipation and feeling in literary response: A neuropsychological perspective'. *Poetics* 23 (1), 1995, pp.275 – 298.

⁵⁷Keen, Suzanne, 2011.

⁵⁸Holland, Norman. *Poems In Persons: An introduction to the psychoanalysis of literature*. New York: W.W. Norton & Company, 1974.

⁵⁹Narvaez, 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.

⁶⁰Fish, Stanley *Is There a Text in This Class? The Authority of Interpretative Communities*. Massachusetts: Harvard University Press, 1982.

⁶¹Wolf, Werner *et al. Metareference across media: theory and case studies*. Amsterdam: Rodopi, 2009.

⁶²Neumann, 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].

⁶³Ibid.

The 'classical' position still has many advantages, not least in its reminder that fictional characters, despite the more-abstract debates on their philosophical and semantic reality, have no *biological* reality: that they are artificial, mediated, 'radically incomplete'⁶⁴ and constructed through originating 'texts'. If characters are indeed persons, that personhood is (in the most literal, practical sense) unreal.

However, the position of audience reception theory, supported by my own experiences as a researcher and as an artist, does not make personhood and artefactuality mutually exclusive. In the reading group I studied, and in my own observations of my artistic processes, characters are constructed *through* reception into 'coherent entities'⁶⁵, 'non-actual individual[s]... endowed with inner states, knowledge and belief sets, memories, attitudes and intentions'⁶⁶ - even if those aspects are never fully, explicitly delineated. As an artist primarily concerned with the production of characters, rather than their logical, semantic or academic nature, I must draw my definitions from such a dynamic. From my own perspective, this is where the nature and activity of characters is decided.

For the purposes of this thesis, I define fictional characters – my own, and those of others – as examples of:

'non-actual'⁶⁷, individual persons, initially and partially mediated within a system of narrative representation, and extrapolated into a more complete personhood through the necessary perceptions and imaginative processes of their audience.

⁶⁴ Genette, Gérard 'Discours du récit'. In: *Figures III*. Paris: Seuil, 1972.

⁶⁵ Laurel, Brenda *Computers as Theatre*. Boston: Addison-Wesley, 1993, p. 3

⁶⁶ Margolin, Uri, 1990, p. 844.

⁶⁷ Margolin, Uri, 1987, p. 3.

From this 'post-classical' definition of character, a general definition of the 'quality' by which such an artefact may be judged can also be gleaned. The static work produced by the artist – what Kuzmicova calls the 'text' factor⁶⁸ - is part of a larger, executive process (a 'reader' and 'situation factor'⁶⁹) where work – and persons - 'only come... to life'⁷⁰. 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 – what Champion calls 'hermeneutic richness'⁷¹ - which must ultimately concern them. This 'quality', being the focus of my study, needs a more definitive term: in the absence of an encapsulating alternative, I will hereafter be referring to a character's 'resonance'. It is a word that has useful, metaphorical connotations: connotations of potential, echo, relay, timbre, tone and volume; elements of communication which, above all, symbolise what a character 'makes the imagination *do*'⁷².

A character's 'resonance', then, may be defined as:

how, and to what degree, the representation of a character interacts with the imagination of an audience, both in becoming a non-actual person within a storyworld, and in how the context and ramifications of their containing text are explored through that imagination.

* * * * *

⁶⁸ Kuzmičová, Anežka 'Literary Narrative and Mental Imagery: A View from Embodied Cognition'. *Style* 48 (3), 2014, pp. 275 – 295, p. 280.

⁶⁹ Ibid.

⁷⁰ Huizinga, Johan. *Homo Ludens*. Boston: The Beacon Press, 1955, p. 165.

⁷¹ Champion, Erik 'Roleplaying And Rituals For Cultural Heritage-Oriented Games'. *Proceedings of DiGRA 2015: Diversity of Play: Games – Cultures – Identities*. DiGRA, 2015.

⁷² Moran, Richard 'The Expression Of Feeling In Imagination'. *The Philosophical Review* 103 (1), 1994, pp. 75 – 106.

Project `knole`, in its academic remit, is concerned with the 'resonance' of one particular form of character: those which feature in works that use digital computation as an integral driver of their narrative significances – such as videogames, digital installations and other works of 'digital art'⁷³.

Project `knole` has been developed as one of these works of computational narrative art (or 'comp-art'): a multi-modal or transmedial⁷⁴ work spread 'intracompositionally'⁷⁵ across several 'platforms'⁷⁶ but together forming a single 'distributed' narrative experience with digital computation at its heart⁷⁷.

The audience's experience of `knole` begins with the project's website (<http://robsherman.co.uk/knole>), which serves as an initial introduction to the narrative context of the work and my research. The website also serves as the delivery mechanism for the main textual element of `knole`'s intracompositional narrative. This is a downloadable collection of documents, supposedly digitised from paper originals, that represent the surviving documentary evidence of Anne Latch from contemporary sources, collected and distributed by a contemporary publisher. It is a fragmentary hodgepodge of contemporary ballads, court proceedings, Anne's written correspondence and the 'receipts', or spells, by which she performed her duties as a cunning woman. This collection (hereafter referred to as the *Housekeeping*, referring to the title given to it by its publisher) may be investigated at the audience member's leisure, and stands as its own, complex portrait of a woman caught in the jaws of a transformational experience, in a transformational age.

⁷³Paul, Christiane *Digital Art*. London: Thames & Hudson, 2015.

⁷⁴Dena, Christy 'Transmedial Fiction'. In: Ryan, Marie-Laure *et al.* (eds.), 2014, pp. 486 – 489.

⁷⁵Dena, Christy *Transmedia Practice: Theorising the Practice of Expressing a Fictional World across Distinct Media and Environment*. [PhD dissertation], University of Sydney, 2009.

⁷⁶Jenkins, 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].

⁷⁷Walker, Jill 'Distributed Narrative: Telling Stories across Networks'. In: Consalvo, Mia *et al.* *Internet Research Annual 2004*. Brighton: Peter Lang, 2004.



Figure 1: The website for Project knole⁷⁸.

While the *Housekeeping* can stand alone as a narrative artefact, it is designed to complement, and augment (along with the website material) another component of the experience entirely. This is a digital installation work, installed (for the purposes of my examination) at Corsham Court in Wiltshire, Bath Spa University's postgraduate campus. However, it has also been installed, during the course of my research, at the Museum of Witchcraft and Magic in Boscastle, Cornwall (see Appendix 1), and there is scope for the installation to be hosted elsewhere in the future (see Conclusion).

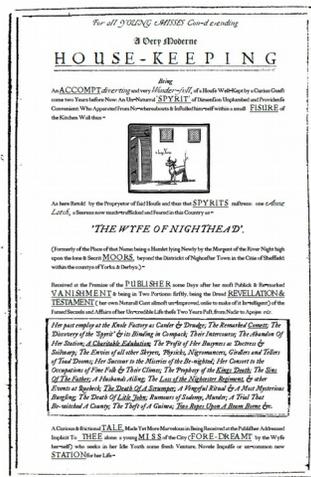


Figure 2: The title page of the *Housekeeping*⁷⁹.

Having visited the project's website, and read the *Housekeeping*, an audience member can visit the installation, wherever it is hosted, and enter a sparse simulacrum of Anne's kitchen: the locus of her personal,

⁷⁸ See Appendix 9, Figure 16.

⁷⁹ See Appendix 9, Figure 17.

historicised domain, and the lair of her 'Beest'. 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 nearly a metre high: far larger than when Anne first discovered it on that wet day in 1758.

Inside that crack, displayed on a large, portrait-oriented touchscreen, is a digital simulation of Anne's 'Beest'; an interactive character rendered as a virtual agent⁸⁰. Drawing on the principles of mixed reality (or, as Bolter might insist, 'augmented virtuality'⁸¹) to partially unite the physical and digital components of this installation, the virtual 'Beest' is sensitive to the audience member's presence through several modes; relying on three cameras, a microphone and a touchscreen to detect vocal volume, specific phrases, movement, facial features, emotions, physical objects and touch input. These inputs (and others) are supported by the use of well-established artificial intelligence techniques, including a behavioural model based on the work of Joanna Bryson at the University of Bath⁸², and a simple emotional/conceptual model that is a hybrid of several different approaches.

⁸⁰ Russell, Stuart and Norvig, Peter *Artificial Intelligence: A Modern Approach*. Boston: Pearson, 2009, p. 31.

⁸¹ 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.

⁸² 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].



Figure 3: The simulation of the 'Beest'⁸³.

The key to this physical/digital interplay is the *Housekeeping* itself. At the centre of the document are a selection of Anne's surviving spells: instructions for using this mysterious 'Beest' as an assistant, a source of ingredients and magical interface, to accomplish all manner of supernatural ends. Visitors can follow Anne's instructions with the 'Beest' themselves, exploring its unique biology and enacting rituals to supposedly cure everything from headaches to cancer; to brew a love potion, or stave off unwanted pregnancies. However, around and between Anne's own words are hints of a darker and deeper context for the 'Beest'. Visitors can err away from Anne's detached, sometimes-cruel directives, perhaps instead treating the simulated creature with something approaching kindness. In the act of interpreting the *Housekeeping*, and in experimenting with that interpretation through their exploration of the 'Beest' and its mixed-reality context, an audience member can illuminate some of those 'mundane horrors' of Anne's life and times; those subjective, emotional conflicts and perspectives that are important to historical and human understanding, but are so often lost to the record.

* * * * *

⁸³ See Appendix 9, Figure 130.

The creation of *any* sort of ‘resonant’ character is no easy task, requiring a keen balance between the affordances and potentials of the media employed, and the potentials for imaginative engagement with audiences. This is arguably the main creative work of any narrative artist. However, this thesis charts how the specific⁸⁴ potentials for the ‘resonant’ representation of fictional characters in the computational mode give rise to specific challenges which remain deep-seated in the practice of the form.

In short, such characters struggle to ally their computational nature with the necessity for them to ‘resonate’ as a ‘non-actual’ person in a narrative text. The most basic elements of such computational characters are still regularly debated at high-profile conferences⁸⁵, jeremiads both popular⁸⁶ and academic⁸⁷ written lamenting their failings; sometimes even their need to exist is questioned⁸⁸. The question remains: how can characters in works of computational art maintain their defining quality of dynamic agency within a system, while also achieving those ‘resonant’ qualities of characters found in more static artforms?

My artistic practice in this project, as an example of computational characterisation, represents an original contribution to this torrid field. Rather than exemplifying cutting-edge technologies, novel algorithms or new subject matter, I have approached this issue laterally. I have attempted to reorient the objective of computational narrative artists – the production of ‘resonance’ through mediating narrative devices - away from the exemplars of other narrative media, through a reconsideration of some of the elements underlying

⁸⁴ 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].

⁸⁵ Koster, Raph *et al.* *AI Wish List: What Do Designers Want out of AI?* San Francisco: Game Developer's Conference, 2018.

⁸⁶ 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].

⁸⁷ Tence, Fabian *et al.* 'The Challenge of Believability in Video Games: Definitions, Agent's Models and Imitation Learning'. France: UEB, 2010.

⁸⁸ Bogost, Ian, 2015.

‘resonance’ - in the main, the human imaginative impulse and its narrative consequences *beyond* the strictly artefactual. I believe this design philosophy, which I call the ‘autocosmic’, better suits the qualities of systemic procedurality and explicit interactivity that undergird many of the potentials of computational narrative art, and might better help such artists produce computational characters of ‘quality’.

This thesis explains and contextualises this design philosophy, and demonstrates how I used it in Project `knole` to create at least two ‘resonant’ computational characters; the ‘Beest’, rendered in simulation directly, and Anne herself, present in computational negative through her influence upon the creature’s closeted little realm: a realm of which she was both architect, and mistress.

The thesis is structured as follows:

Chapter 1 more precisely defines ‘computational narrative art’, and subsequently the concept of ‘computational character’, in the context of this thesis. It then explores the specific history and affordances of such characters: the particular potentials, and challenges, of creating characters that are both computationally meaningful and narratively ‘resonant’.

Chapter 2 proposes and develops the ‘autocosmic’ design philosophy, building on strong interdisciplinary consensus, as an approach to realising some of the aforementioned potentials, and addressing some of their accompanying challenges: primarily, through seeking practical exemplars of narrative engagement *outside* the purview of older, static artforms.

Chapter 3 is a more specific study of how the ‘autocosmic’ philosophy was employed in Project `knole`. In short, I detail how

human imaginative engagement with environments and ecosystems throughout history – engagement that is often systemic, narrative and socialised - serves as a better model for systemic, narrative representations of computational character with which an audience can socially interact; as opposed to traditional character models from literature, film and other static artforms. This model of ‘character-as-environment’ provides a basis for addressing the issues of computational character development through *knole*’s fiction, artefactual construction and strategies of audience engagement.

The **Conclusion** addresses the development of the artistic work, and avenues of study, initiated by this Project. It looks at possible future refinements of the ‘autocosmic’ philosophy, and the concept of ‘character-as-environment’, in future projects. Most broadly, it considers how a person-oriented, systems-focused, interdisciplinary approach to narrative production might yield ‘resonant’ results beyond those narrowly pursued in these pages, and in my shadowy recreation of Anne Latch’s kitchen.

"The Warmth Without The Fyre"

Specific Challenges To Authoring Resonant Computational Characters

Section 1.1: Fuller Definitions Of Computational Art & Computational Character

While the Introduction to this thesis gave broad definitions to set the most general bounds of my enquiry, 'transcending' any explicit form⁸⁹, Project `knole` is, in fact, in an explicit form, using an explicit set of modes and 'media ecolog[ies]'⁹⁰ to achieve its goals. In this chapter I focus on the specific ramifications of the type of narrative art, and type of character, that I am interested in building.

This specificity is not merely for reasons of scope, but also for those of theoretical rigour. As Marshall McLuhan suggested over fifty years ago, 'the medium is the message'⁹¹: though this statement was not without its ambiguities, it is true that the technologies, 'frameworks'⁹² 'tools... materials... and capacities'⁹³ that a narrative artist uses, alongside their attendant cultures, institutions and constraints, are not 'neutral vessel[s]'⁹⁴ for an imaginative process, or 'pipelines for the transfer'⁹⁵ of agnostic meaning, but are also constitutive 'languages'⁹⁶ and 'specific affordances'⁹⁷ by which meaning is constructed in the

⁸⁹ Koenitz, Harmut, 2015, p.94.

⁹⁰Goddard, Michael. 'Media Ecology' In: Ryan, Marie-Laure et al. *The John Hopkins Guide To Digital Media*. Baltimore: John Hopkins University Press, 2014, p. 331.

⁹¹McLuhan, Marshall *Understanding Media: The Extensions Of Man*. Massachusetts: The MIT Press, 1994.

⁹² 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.

⁹³ Thomson-Jones, Katherine *The Philosophy Of Digital Art*, 2015 [Online]. Available at: <https://plato.stanford.edu/entries/digital-art/> [Accessed: 8th August 2018].

⁹⁴ Parry, Ross *Museums In The Digital Age*. Oxon: Routledge, 2010, p. 226.

⁹⁵ Ong, Walter J. *Orality and Literacy. The Technologizing of the Word*. London: Methuen, 1982.

⁹⁶ Meyrowitz, Joshua. 'Images of Media: Hidden Ferment—and Harmony—in the Field.' *Journal of Communications* 43, 1993, pp. 55–66

⁹⁷ Koenitz, Hartmut 'Towards A Theoretical Framework for Interactive Digital Narrative'. *Proceedings of the Third Joint Conference on Interactive Digital Storytelling, ICIDS:*

audience's reception of that work. They not only facilitate a character's 'resonance', but help shape its very nature.

The installation, and the computational simulation at its heart, forms the thematic and methodological navel of the entire *know* experience. The *Housekeeping* and the website are augmentative of it, and are employed in support of it (see Chapter 3); while the transmedial nature of the project is an important drive for its narrative power, the project as a whole is undoubtedly, first and foremost, a work specifically of narrative computational art, or comp-art. This thesis stands as a 'medium-specific analysis'⁹⁸ of characters created using this subset of tools.

The term 'computational art' is a nominal one, designed to encapsulate an indistinct cluster of different artistic traditions, often 'present[ing]... liminal... category-challenging experiences'⁹⁹ in seemingly perpendicular cultures. There remains little agreement on how best to delineate and summarise its core qualities and member artefacts; the concept (however it is expressed) has variously stretched and shrunk to incorporate such diverse work as videogames, robotic art, interactive fiction, 'interactive digital narrative'¹⁰⁰, web art, 'interactive... immersion exhibits'¹⁰¹, digital installation art and many others. Terms like new media¹⁰², interactive art¹⁰³, digital art¹⁰⁴¹⁰⁵ or any other number of terms all have some lack, or imprecision, of their own.

Edinburgh, 2010, p.2.

⁹⁸ Hayles, Katherine 'Print Is Flat, Code Is Deep: The Importance of Media-Specific Analysis'. *Poetics Today* 25 (1), 2004, pp.67 – 90.

⁹⁹ 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].

¹⁰⁰ Koenitz, Harmut, 2015.

¹⁰¹ 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].

¹⁰² Manovich, Lev. *The Language of New Media*. Massachusetts: The MIT Press, 2001.

¹⁰³ 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.

¹⁰⁴ Simanowski, Roberto, 2014, p. 133.

¹⁰⁵ Paul, Christiane *Digital Art*. London: Thames and Hudson, 2015.

As a working artist who is undertaking a practical investigation, I prefer the phrase 'computational art' because it makes a practical distinction as to the methodological baseplate that such works share. It makes a distinction between the 'intramedial'¹⁰⁶, 'prototypical qualities' that candidate artworks all possess¹⁰⁷, and the modes and 'formal poetics'¹⁰⁸ by which they communicate their significances. In short, it is a term that speaks more precisely to *what* these works do, and *how* these works do it.

Above all else, 'comp-art' is art that computes – that dynamically 'calculate[s]'¹⁰⁹, manipulates, 'integrate[s]'¹¹⁰¹¹¹, generates or transforms variable information¹¹², as digitally-represented 'data'¹¹³, by means of an 'electronic computational device'¹¹⁴ operating according to sets of programmed instructions which represent the 'codified rules of operation'.¹¹⁵ Often (yet not always), this computation is defined by the 'explicit'¹¹⁶ influence and interaction of the audience themselves, allowing them to 'intervene in a meaningful way'¹¹⁷: by using a 'technical interface'¹¹⁸ which converts their physical actions into data parseable by the machine. This allows them to 'intentionally influence salient

¹⁰⁶ Ibid.

¹⁰⁷ Kahurlahti, Veli-Matti 'Defining The Videogame'. *Game Studies* 15 (2), 2015, [Online]. Available at: <http://gamestudies.org/1502/articles/karhulahti> [Accessed 8th August 2018].

¹⁰⁸ Galloway, Alexander, 2006, p. 113.

¹⁰⁹ 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].

¹¹⁰ Neitzel, Britta *Narrativity of Computer Games*, 2014 [Online]. Available at: <http://www.lhn.uni-hamburg.de/article/narrativity-computer-games> [Accessed 8th August 2018].

¹¹¹ Manovich, Lev, 2001, p. 47.

¹¹² Manovich, Lev, 'New Media: a User's Guide', *Manovich*, 1999 [Online]. Available at: <http://manovich.net/index.php/projects/new-media-a-user-s-guide> [Accessed: 20th October 2019].

¹¹³ 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.

¹¹⁴ Galloway, Alexander R *Gaming: Essays in Algorithmic Culture*. London: University of Minnesota Press, 2006.

¹¹⁵ Galloway, Alexander, 2006, p.5.

¹¹⁶ Salen, Katie and Zimmerman, Eric, 2004, p. 69.

¹¹⁷ Cameron, Andy *Dissimulations: Illusions of Interactivity*, 1995 [Online]. Available at: <http://infotype.rmit.edu.au/rebecca/html/dissimulations> [Accessed 8th August 2018].

¹¹⁸ Dreher, Thomas *History of Computer Art*, 2015 [Online]. Available at: http://iasl.uni-muenchen.de/links/GCA_Indexe.html [Accessed 8th August 2018].

aspects'¹¹⁹ of the representation and 'push... into the system'¹²⁰, either 'explor[ing]' that system or 'ontological[ly]' manipulating its data themselves, thus materially performing the narrative 'instantiation'¹²¹¹²². In narrative comp-art, the 'text' or experience is thus computed; no longer a purely static representation but to some degree manipulated, and 'instantiat[ed]', according to the host hardware, by the software's 'rules of operation'¹²³ and the various inputs to that instantiation.

'Computational' is not a perfect term, nor is it unique to modern digital technology. Some non-digital artforms, such as improvisational theatre¹²⁴, Oulipan literature¹²⁵ and tabletop roleplaying¹²⁶ are computational, with rulesets of varying determinacy. However, the term is now so naturalised to digital technology that it can usefully serve to collectively denote what Keogh calls a 'particular', rather than a 'unique'¹²⁷, sort of narrative art: works whose narrative elements, including their characters, are in part explicitly produced through the computational paradigm, and in part participatory of other narrative cultures, forms and modes.

If computational narrative art is a specific type of narrative, it follows that the representations of the characters in those narratives must be specific in their own way, while still sharing many of the same universal, 'intermedial'¹²⁸ qualities that *any* character possesses.

¹¹⁹ Roth, Christian and Koenitz, Hartmut 'Evaluating the User Experience of Interactive Digital Narrative'. *Proceedings of the 1st International Workshop on Multimedia Alternate Realities* (2016), pp.31 -36.

¹²⁰ Anthropy, Anna and Clark, Naomi, 2014, p. 137.

¹²¹ Koenitz, Hartmut *et al.*, 2015, p. 98.

¹²² 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.

¹²³ *Ibid.*

¹²⁴ Frost, Anthony and Yarrow, Ralph *Improvisation in Drama, Theatre and Performance: History, Practice, Theory*. London: Palgrave Macmillan, 2007.

¹²⁵ Matthews, Harry and Brotchie, Alastair *Oulipo Compendium*. London: Atlas Press, 2010.

¹²⁶ Bowman, Sarah Lynne *The Functions of Role-Playing Games: How Participants Create Community, Solve Problems and Explore Identity*. North Carolina: McFarland and Company, 2010.

¹²⁷ 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].

¹²⁸ Rajewsky, Irina 'Intermediality, Intertextuality and Remediation: A Literary Perspective on Intermedialities' *Intermedialities* 6 (1), 2005, pp. 43–64, p. 43.

Characters in work of narrative comp-art are still 'carefully structured and constrained'¹²⁹ and 'deliberately simplified'¹³⁰ representations of a non-actual personhood and their travails, manufactured within a 'system of representation'¹³¹ by an artist to be 'read'¹³² by its audience. The audience reception model, by which I arrived at my original definitions of character and 'resonance', is similarly important to comp-art. A privileging of the phenomenon of 'communication' and the 'participating act'¹³³, of comp-art as 'experience [rather than] artefact or object'¹³⁴, is identifiable across the literature: from Turing's original writings on artificial intelligence¹³⁵, within the game design canon and interactive design literature, through to human-computer interaction and game design's own investigations into audience reception theory explicitly. A computational character is thus still a member of the wider population of mediated, received 'non-actual' persons¹³⁶, and must still adhere to the most general precepts of their construction.

However, as the previous section delineated, a chosen medium gives a character a definite 'language'¹³⁷ through which these precepts can be reached in specific manifestations: in this case, the use of computational techniques to represent personhood, as a form of *computational character*.

Such characters can take many forms. Most commonly, they include 'system-based artworks... exhibit[ing] autonomous behaviours and... intentions'¹³⁸, 'computational entities that... interact... with

¹²⁹ Murray, Janet *Hamlet on the Holodeck: The Future of Narrative In Cyberspace*. Boston: MIT Press, 1997, p. 132

¹³⁰ Crawford, Chris *Art of Computer Game Design*. New York: McGraw-Hill, 1984, p. 9.

¹³¹ Mateas, Michael 'Expressive AI: A Hybrid Art And Science Practice' *Leonardo* 34 (2), 2001, pp. 147-153.

¹³² Flanagan, Mary *Critical Play: Radical Game Design*. Massachusetts: The MIT Press, 2009, p. 140.

¹³³ Koenitz, Hartmut *et al.*, 2015, p. 92.

¹³⁴ Candy, Linda and Ferguson, Sam (eds.) *Interactive Experience in the Digital Age*. London: Springer, 2014, p. 2.

¹³⁵ Sterrett, Susan 'Turing's Two Tests For Intelligence*'. *Minds and Machines* 10 (4), 2000, pp. 541 – 559.

¹³⁶ Margolin, Uri, 1987, p. 110.

¹³⁷ Meyrowitz, Joshua, 1993.

¹³⁸ Candy, Linda and Ferguson, Sam (eds.), 2014, p. 3.

human beings¹³⁹; 'sociable machines'¹⁴⁰¹⁴¹; or, more prosaically (and contestedly) artificial intelligence¹⁴². Some, such as the recently-dead scientists and soldiers of first-person shooter *Doom 3*¹⁴³ or the character of Henry David Thoreau's sister Sophia in 'heritage game' *Walden: A Game*¹⁴⁴, 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 approach, using the computational mode to build 'drama' or 'experience' managers¹⁴⁵ which compute dramatic structures, plots, genre conventions and narratological procedures rather than individual character's personhoods; perhaps the most well-known example of this remains the interactive drama *Façade*¹⁴⁶. 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; as Appendix 4 illustrates, such characters lie outside the purview of this thesis.

Perhaps the most paradigmatic approach – and the one which I have followed most centrally with Project `knole` – cleaves to the 'character-focussed'¹⁴⁷ theories outlined in the Introduction, by which characters are perceived as 'perdurant'¹⁴⁸, individual, complex and hermetic individuals; in other words, as 'intelligent agents'¹⁴⁹.

In such an approach, the practical and formal are tied to the theoretical; representations of characters are constructed so as to be, in

¹³⁹ Turkle, Sherry 'Artificial Intelligence At 50: From Building Intelligence to Nurturing Socialabilities'. *Proceedings of Dartmouth Artificial Intelligence Conference*, 2006.

¹⁴⁰ Brazeal, Cynthia *Designing Sociable Robots*. Massachusetts: The MIT Press, 2002.

¹⁴¹ Kidd, Cory *et al.* 'Effect of a robot on user perceptions'. *Proceedings of IROS 2004*: Sendai, 2004.

¹⁴² Russell, Stuart and Norvig, Peter, 2009.

¹⁴³ Id Software *DOOM 3*. [PC Software] US: Activision, 2004.

¹⁴⁴ Fullerton, Tracy *et al.* *Walden: A Game* [PC Software]. US: USC Games, 2017.

¹⁴⁵ Reidl, Mark *et al.*, 2011.

¹⁴⁶ Mateas, Michael and Stern, Andrew 'Facade: An Experiment in Building a Fully-Realized Interactive Drama'. Game Developer's Conference, 2003.

¹⁴⁷ Currie, Gregory, 2009, p.61.

¹⁴⁸ Lewis, David Kellogg, 1986.

¹⁴⁹ Bickmore, Timothy *et al.* *Proceedings Of The 14th International Conference on Intelligent Virtual Agents*. Boston: IVA, 2014.

procedural simulation, complex individuals featuring some of the elements 'central to personhood'¹⁵⁰; most commonly memories, emotions, 'reciprocity' and social interaction¹⁵¹, 'personality'¹⁵² and, perhaps most importantly, dynamic agency: the ability to in some way 'change, and create and pursue goals'¹⁵³ within a complex system. In its simplest terms, Project `knole` is a narrative work of comp-art centred around an agent-based computational character: the simulation of Anne's 'Beest'. It uses the tenets of computation to represent many of the qualities of personhood described above, featuring a simple emotional model, subdoxastic reactions to stimuli, the encoded apparatus of decision-making, and a simulated embodiment. 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, robots, 'virtual humans' and 'interactive, intelligent agents' in works of heritage interpretation and research¹⁵⁴.

Whatever their specific form, it can be argued that (borrowing Slater's pillars of traditional aesthetic judgement) such computational characters, and the narrative works that contain them, use the computational paradigm and the 'nature of complex systems'¹⁵⁵, in combination with the audience's imaginative faculties, to *form*, *represent* and *express* personhood 'resonantly'¹⁵⁶.

¹⁵⁰ 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.

¹⁵¹ Gouldner, Alvin 'The Norm of Reciprocation: A Preliminary Statement'. *American Sociological Review* 25, 1960, pp. 161-178.

¹⁵² Afonso, Nuno and Prada, Rui, 2008.

¹⁵³ Russell, Stuart and Norvig, Peter, 2009, p. 4.

¹⁵⁴ 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.

¹⁵⁵ Anthropy, Anna and Clark, Naomi *A Game Design Vocabulary: Exploring The Foundational Principles Behind Good Game Design*. Boston: Addison-Wesley, 2014, p.184.

¹⁵⁶ Slater, Barry, 2018.

Section 1.2: Specific Potentials For The ‘Resonance’ Of Computational Characters

Computational characters in works of narrative comp-art ‘resonate’ in specific (or ‘particular’¹⁵⁷) ways. They have definitive ways of achieving that resonance, and particular criteria for evaluating its effectiveness. My original definition of ‘resonance’, in this thesis’ Introduction, was a universal one; the nature and extent of the interactions between a character representation and its audience’s embodied imagination. I believe that this definition still holds, in the main, for computational characters. A comp-artist still ‘projects... a world’¹⁵⁸, just as any narrative artist provokes, semantically, a ‘virtual reality’¹⁵⁹ in the minds of their audience. They are still concerned with the ‘holding power’¹⁶⁰ of those realities and their denizens, their potential for ‘immersion’¹⁶¹, ‘incorporation’¹⁶², ‘presence’¹⁶³, involvement¹⁶⁴ and believability¹⁶⁵.

In order to test this, I supplemented my work with reading groups (outlined in Appendix 2) with a study into the experiences of participants playing a selection of videogames (see Appendix 3). Despite the diversity of character representation in the games under study – from the abstract blocks of *Thomas Was Alone*¹⁶⁶ to the ostensibly ‘realistic’ representations of fantastical characters in *The Elder Scrolls V: Skyrim*¹⁶⁷ - in each case the player undertook a familiar process of narrative engagement, recognisable from my original reading study.

¹⁵⁷Keogh, Brendan, 2015.

¹⁵⁸ 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.

¹⁵⁹ Ryan, Marie-Laure, 2015.

¹⁶⁰ Turkle, Sherry *The Second Self: Computers and the Human Spirit*. Massachusetts: The MIT Press, 2005, p. 65.

¹⁶¹ Thon, Jan Noel, 2014, p. 269.

¹⁶² Calleja, Gordon, 2011.

¹⁶³ Ludic Reality: a consecality: a construct for analysing meaning-mapping and epistemology in play’. [Research Paper]. University of Portsmouth, 2007.

¹⁶⁴ Ibid.

¹⁶⁵ Loyall, Bryan A. *Believable Agents: Building Interactive Personalities*. [PhD Dissertation]: Carnegie Mellon University, 1997.

¹⁶⁶ Bithell, Mike *Thomas Was Alone*. [PC Software] UK: Mike Bithell, 2012.

¹⁶⁷ Bethesda Softworks *The Elder Scrolls V: Skyrim*. [PC Software] US: Bethesda Softworks, 2011.

Partial representations of characters, through perception and interaction, were extrapolated and vivified through imaginative, 'social'¹⁶⁸ augmentation and reciprocal 'sensemaking'¹⁶⁹ and 'signification'¹⁷⁰ into 'autonomous intentional agents'¹⁷¹, drawing on a familiar suite of diverse 'underlying logic[s]'¹⁷², 'personal needs, associations, biases and fantasies'¹⁷³: the participant's personal memories, their socio-cultural contexts, their emotions, their bodies¹⁷⁴, 'non-diegetic'¹⁷⁵ elements such as game interfaces¹⁷⁶, and extra-textual knowledge of the form's conventions, cultures and norms. The participants, like those in my reading group study, were concerned with familiar markers of 'resonant' sophistication: a capacity for 'complexity', 'hidden layers' and the ability 'to make people care about... subjects, and... subject's feelings'.

All of the above qualities may, as in any character, be taken as markers of 'resonance': however, they do not speak to the narrower methodologies by which this 'resonance' is achieved; 'how', and 'to what extent', in my original definition, are left undefined, and are subjective to both the specific form of the character and the party undertaking the evaluation. Who decides on the measures of resonance, and how they will be evaluated?

Like other artefactual characters, computational characters may be judged according to the traditional yardstick of the author or

¹⁶⁸ Calleja, Gordon *In-Game: From Immersion to Incorporation*. London: MIT Press, 2011, p. 43

¹⁶⁹ Lucas, Pereira Luis and Licinio, Roque 'Understanding the Videogame Medium Through Perspectives Of Participation'. *Proceedings of the 2014 DiGRA International Conference: DeFragging Games Studies*, 2014.

¹⁷⁰ Flanagan, Mary, 2009, p.192.

¹⁷¹ Mar, Raymond and Oatley, Keith, 2008, p. 174.

¹⁷² Manovich, Lev, 'Database as a Genre of New Media', *AI & Society*, 2001 [Online]. Available at: http://vv.arts.ucla.edu/AI_Society/manovich.html [Accessed: 9th October, 2020].

¹⁷³ Baker, Malcolm and Richardson, Brenda *A Grand Design: The Art of the Victoria and Albert Museum*. London: Victoria and Albert Museum, 1997.

¹⁷⁴ Stojnic, Aneta 'Digital anthropomorphism'. *Performance Research* 20 (2), 2015, pp. 70 – 77.

¹⁷⁵ 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.

¹⁷⁶ Keogh, Brendan *On The Beginner's Guide*, 2015 [Online]. Available at: <https://brkeogh.com/2015/10/03/on-the-beginners-gude/> [Accessed: 8th August].

designer's 'communicative intention'¹⁷⁷, often 'persuasive [or] didactic'¹⁷⁸ in nature. 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'¹⁷⁹, and how it cleaves to those original intentions. Others (particularly in computational discourses) have de-emphasised the author's personal objectives and perspectives as biased, 'highly flawed'¹⁸⁰, patriarchal¹⁸¹, over-simplistic¹⁸² or irrelevant; instead favouring the criteria for judgement that arise from the audience themselves in reception of the text. However, in the search for a consensus of interrogable evaluative criteria, this 'messier' reliance upon the 'protean'¹⁸³ and diverse responses of mass audiences has often proved difficult to utilise for theoretical work and its attendant models; particularly when the difficulty of quantifying unexpected and 'aberrant encodings'¹⁸⁴ are taken into account. In computational art, often dominated by player-centric cultures of videogame practice, this over-privileging of audience response is increasingly being questioned.

Many evaluative models of audience reception, particularly in comp-art, do not treat 'resonance' as a quantitative gauge, but rather as 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; each perspective on such an interlock dependent on subjective concerns. While others may (and indeed do) have other perspectives on how I might define an achievable and desirable 'resonance' in my work, as both producer and critic of *knowle* (under the aegis of a self-reflexive academic investigation) it is my own perspective and objectives, informed by the literature, that must

¹⁷⁷ Schonert, Jorg *Author*, 2014 [Online]. Available at:

<http://www.lhn.uni-hamburg.de/article/author> [Accessed 8th August 2018].

¹⁷⁸ Wolf, Werner 'Aesthetic Illusion'. In: Wolf, Werner *et al. Immersion And Distance: Aesthetic Illusion in Literature and Other Media*. Amsterdam: Rodopi, 2013.

¹⁷⁹ Murray, Donald M, 1982.

¹⁸⁰ Wolf, Werner, 2004, p. 326.

¹⁸¹ Eagleton, Mary 'Feminism and the Death of the Author'. In: Eagleton, Mary *Figuring The Woman Author in Contemporary Fiction*. London: Springer, 2005, pp. 15 – 36.

¹⁸² Cioffi, Frank. 'Intention and Interpretation in Criticism'. *Proceedings of the Aristotelian Society* 64 (85), 1963.

¹⁸³ Keen, Suzanne, 2011, p.296.

¹⁸⁴ 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.

form the frame of my enquiry – for all their potential bias. 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'¹⁸⁵, seeking to satisfy some artistic objective; admittedly, this remains an under-explored area of study.

As such, I have judged the 'resonance' of my characters in both generic and specific manners, while attempting 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.

Like many narrative artists who subscribe to reception theory, I will consider my characters 'resonant' if my audience responds emotionally, socially and intellectually to them as realised, 'non-actual'¹⁸⁶ persons. I will also judge them by the extent to which they create a 'pluralistic'¹⁸⁷ and rich evocation of the historical era in which they are situated, and how they challenge existing ideas and attitudes, or 'unsettle established meanings'¹⁸⁸. However, I am also interested in two more contingent measures of my own: how well my characters explore and expand the concept of character itself, 'metareferential[ly]'¹⁸⁹; and finally, how my characters achieve all of these 'resonant' goals through the 'particular'¹⁹⁰ affordances and potentials of the computational medium.

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¹⁸⁵ Murray, Donald M. 'Teaching The Other Self: The Writer's First Reader'. *College Composition and Communication* 33 (2), 1982, pp. 140-147, p.140.

¹⁸⁶ Margolin, Uri, 1987, p. 110.

¹⁸⁷ 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.

¹⁸⁸ Bouquet, Mary. 'Thinking And Doing Otherwise: Anthropological Theory in Exhibitionary Practice'. In: Carbonell, Bettina *Museum Studies: An Anthology of Contexts*. Chichester: Wiley-Blackwell, 2012. p. 186.

¹⁸⁹ 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.

¹⁹⁰ Keogh, Brendan, 2015.

What are such potentials of the computational medium, and of computational characters? Many frameworks, theories, advocacies and artworks exist as evangelising examples of the 'new possibilities in art and entertainment'¹⁹¹ for 'unique aesthetic experiences'¹⁹², 'new models of character, story and language'¹⁹³ and an 'expan[sion of] the catalog of narrative modalities'¹⁹⁴ to 'deliver... radically new forms of art... and social experiences'¹⁹⁵ and 'augment and afford experiential understanding'¹⁹⁶. Of course, one must be cautious not to define any one, unique goal for an entire artform: as this thesis will explore, comp-artists have many different philosophies, and objectives, for their practice. What is more (and as Keogh's chosen adjective tries to encompass), terms such as 'new' and 'unique' are troublesome when one considers the venerability of the human imaginative response which all art draws upon. They are terms which are tinged with a utopianism and triumphalism that often infects technological discourses, and does not recognise the universalities in the purpose of *all* art. However, reviewing the literature it seems reasonable to state that there is a consensus of what a work of narrative comp-art – and a computational character – *might* do.

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 computers¹⁹⁷. In comp-art, this computation of audience engagement is partnered with the computation of the artwork itself: a systemic and materially dynamic, rather than merely mimetic and static, representation. It is from this partnership and interplay of computations and communications, of

¹⁹¹ Mateas, Michael. 'Interactive drama, art and artificial intelligence'. [PhD Thesis]. Pittsburgh: Carnegie Mellon University, 2002.

¹⁹² De Lucena, Daniel Pettersen and Da Mota, Rosilane Ribeiro, 2017, p. 816.

¹⁹³ Wardrip-Fruin, Noah, 2009, p.2.

¹⁹⁴ Ryan, Marie-Laure, 2001.

¹⁹⁵ Ryan, Marie-Laure 'Preface'. *In: Ryan, Marie-Laure et al. (eds.)*, 2014, p. ix.

¹⁹⁶ Champion, Erik 'Otherness of Place: Game-based Interaction and Learning in Virtual Heritage Projects'. *International Journal of Heritage Studies* 14 (3), 2008, pp. 210 – 228.

¹⁹⁷ Oatley, Keith, 2008.

these two sorts of Suzanne Keen's 'unpredictable afterwards'¹⁹⁸, that computational character draws much of its power.

Computational characters court the imaginations of their audiences not just as 'active' readers¹⁹⁹ of static texts, but as 'operator[s]'²⁰⁰ and 'participa[nt]s... in... cybernetic circuit[s]'²⁰¹, 'interaction trajectories'²⁰² which ergodically²⁰³ *produce* texts or, in Benford and Giannachi's conception, 'trajectories'²⁰⁴; 'dynamic syuzhets'²⁰⁵²⁰⁶ from authored *fabulas* of varying determinacy. These circuits, their resultant texts and the communicative acts which they entail thus can become complex, interpenetrated sites of 'resonant' imaginative engagement, interpretation or 'incorporation'²⁰⁷, creating 'beauty and meaning'²⁰⁸ through characterisation by their own means of 'expressive processing'²⁰⁹. These engagements include those with the structures of the database; with the 'coherent'²¹⁰ rulesets, 'dynamics' or 'mechanics'²¹¹ 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 in their 'cybernetic relationship'²¹², whether 'canonically' designed to occur or non-deterministically emergent; away from direct engagement through 'offline', 'macro' engagement²¹³, 'historic' recall²¹⁴ and 'synoptic'

¹⁹⁸ Keen, Suzanne, 2011, p. 300.

¹⁹⁹ Flanagan, Mary, 2009, p. 170.

²⁰⁰ Galloway, Alexander, 2006, p.5.

²⁰¹ Calleja, Gordon, 2011, p.2.

²⁰² Benford, Steve and Giannachi, Gabriella, 2011.

²⁰³ Aarseth, Espen. *Cybertext: Perspectives on Ergodic Literature*. Baltimore: John Hopkins University Press, 1997.

²⁰⁴ Benford, Steve and Giannachi, Gabriella, 2011.

²⁰⁵ Wood, Hannah 'Dynamic Syuzhets: Writing and Design Methods for Playable Stories'. *Proceedings of the International Conference on Interactive Digital Storytelling*, 2017, pp. 24 – 37.

²⁰⁶ Nietzel, Britta, 2014.

²⁰⁷ Calleja, Gordon, 2011.

²⁰⁸ 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.

²⁰⁹ Wardrip-Fruin, Noah *Expressive Processing: Digital Fictions, Computer Games and Software Studies*. Massachusetts: The MIT Press, 2009.

²¹⁰ Benford, Steve and Giannachi, Gabriella, 2011.

²¹¹ 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.

²¹² Mullaney, Brett *The Greatest Art Form: Video Games and the Evolution of Artistic Expression*. CreateSpace, 2013.

²¹³ Newman, James, 2002.

²¹⁴ Benford, Steve and Giannachi, Gabriella, 2011.

judgement²¹⁵; in totality, as a holistic, complex and multifaceted 'involvement'²¹⁶.

Specifically for computational characters - the very core of these narrative texts and interpretative acts - 'particular'²¹⁷ opportunities for engagement arise. They present interesting opportunities for narratively significant relationships between characters and audiences; 'co-presence'²¹⁸ with an 'intimate machine'²¹⁹, potential 'discussion partner'²²⁰ or 'social partner'²²¹ that goes beyond the parasocial and becomes truly social, leading audiences to experience personally-oriented emotions such as pride, shame and guilt as a direct result of their own actions, and potentially opening fresh lines of enquiry, understanding, empathy and engagement. 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' way to understand and represent the functioning of the complex 'cosmos' of personhood: directly utilising human sensitivity to relational elements, underlying patterns and systemic affordances in environments to create 'deeper understandings'²²², 'metaphors'²²³ and 'emotional nuance'²²⁴ for the complex beings, relationships and social processes that lie at the heart of all stories. For simulationists like Bogost and Frasca, the systemic and the computational can teach us, through a 'procedural rhetoric'²²⁵, what it means to be human²²⁶.

²¹⁵ Calleja, Gordon, 2011, p.4.

²¹⁶ Newman, James, 2002.

²¹⁷ Keogh, Brendan, 2015.

²¹⁸ Calleja, Gordon, 2011, p.4.

²¹⁹ Frude, Neil and Jandric, Petar 'The Intimate Machine – 30 Years On'. *E-Learning & Digital Media* 12 (3-4), 2015, pp. 410 – 424.

²²⁰ Crane, Susan, 2012, p. 308.

²²¹ Machidon, Octavian *et al.*, 2016, p. 250.

²²² 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].

²²³ 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.

²²⁴ Bogost, Ian, 2015.

²²⁵ Bogost, Ian, 2017.

²²⁶ Frasca, Gonzalo 'Simulation versus Narrative: Introduction to Ludology'. *In: Wolf, Mark and Perron, Bernard (eds.) The Video Game Theory Reader*. New York: Routledge, 2003.

Project `knole`, then, is an attempt to achieve ‘resonance’ through these specific potentials; and it is perhaps the greatest methodological challenge 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, interactive fiction and games design. `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: in its construction, and in its fiction, it is (quite literally) a face-to-face confrontation with the struggles of computational character to achieve this ‘particular’²²⁷ potential over its still-lengthening history.

²²⁷ Keogh, Brendan, 2015.

Section 1.3: The Challenges of Computational Characterisation

Given its role as one of 'the Holy Grail[s] of digital entertainment'²²⁸, art and education, one of its 'ultimate goal[s]'²²⁹, it is no surprise that the potential 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'²³⁰, 'as elusive as [they are] enticing'²³¹ and subject to fundamental difficulties and 'open problems'²³² that are 'particular'²³³ to the form.

For some, these challenges are always productive; for others, they threaten 'the viability of interactive digital storytelling'²³⁴ itself, relegating comp-art to '[playing] second fiddle to cinema, literature [and] music'²³⁵ as a narrative art-form, in which 'the best... stories are still worse than even middling books and films'²³⁶. Criticisms range from practitioners lamenting, as recently as 2013, that videogames can create more believable guns than people²³⁷; to charges of 'wooden cutouts'²³⁸, 'shallow, static and lacking in believability'²³⁹; virtual heritage specialists criticising the difficulties of achieving 'social' or 'cultural presence' in the

²²⁸ 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.

²²⁹ Machidon, Octavian *et al.*, 2016, p. 250.

²³⁰ 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].

²³¹ Ryan, Marie-Laure, 2014, p. 292.

²³² Riedl, Mark, 2012, p.3.

²³³ Keogh, Brendan, 2015.

²³⁴ 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.

²³⁵ 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].

²³⁶ Bogost, Ian, 2017.

²³⁷ 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].

²³⁸ Hruska, Joel *The Quest To Improve Videogame AI*, 2016 [Online]. Available at: <https://www.magzter.com/articles/1642/143107/56a26114033e9> [Accessed 8th August 2018].

²³⁹ Koenitz, Hartmut *et al.*, 2015, p. 2.

virtual spaces at the centre of their interpretations²⁴⁰; and 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'²⁴¹, and resurrect older debates about the role of narrative in comp-artforms such as videogames; asking provocative questions about whether 'interactive digital narrative' is any longer the most appropriate goal for scholarship and practice²⁴²: indeed, whether comp-art is really an appropriate tool for representing character and narrative *at all*²⁴³²⁴⁴²⁴⁵²⁴⁶.

While the execution of character in all works of narrative art is subject to criticism, there seems to be a typical difference in how computational character is discussed. There is a basal, historic challenge of 'resonance'; namely, a challenge in making characters *both* cleave meaningfully to the precepts of their form, *and* be resonant with the general imaginative 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 computer itself, its 'internal affordances'²⁴⁷ and 'prototypical qualities'²⁴⁸; and the cultural issues, in comp-artforms themselves, to which such formal issues inevitably and naturally give rise.

²⁴⁰ 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.

²⁴¹ Bogost, Ian, 2017.

²⁴² Szilas, Nicolas in Koenitz, Hartmut *et al.* (eds.), 2014, p. 136.

²⁴³ Bogost, Ian, 2015.

²⁴⁴ Bogost, Ian, 2017.

²⁴⁵ Jull, Jesper 'Games telling Stories? A brief note on games and narratives'. *Game Studies* 1 (1), 2001.

²⁴⁶ Eskenlinen, Markku 'The Gaming Situation'. *Game Studies* 1 (1), 2001.

²⁴⁷ Copplestone, Tara, 2017, p. 88.

²⁴⁸ Thon, Jan-Noel, 2014, p. 334.

Project `knowle`, both in its form and fiction, seeks to represent these challenges. It explores the fundamental 'technical limitations'²⁴⁹ of the computational mode; limitations that arise from the 'formality gap'²⁵⁰ in comp-art's communication of complete worlds through incomplete representation: the translation, as Simon Penny has it, of 'atoms into bits'²⁵¹.

* * * * *

Though her birth pre-dates the invention of the digital computer by some 200 years, the concerns of my character Anne Latch seem oddly familiar. In the letter at the heart of the *Housekeeping*, which forms a sort of proto-feminist rationalist manifesto, Anne laments the complexity, unpredictability and attendant dangers of the world around her; a world where the functionality of its systems are still largely misunderstood by a majority of the populace. In everyday life (particularly, as Anne bitterly notes, the lives of women), such obscure systemics are perceived variously as luck, fate, fortune, or the caprice of supernatural beings. In Anne's case, it is the personified whims of a malevolent 'Forse', drawing on a piecemeal, 'inosent' Theory cribbed from her semi-literate understanding of the principles of Gravity, which gofern[s]... over all Bodies', and underpins the workings of the Visible world. In such a world the ability to explain, to simplify, to map, to model – indeed to control – the ineffable and the inexplicable are highly sought; whether through the practice of modern (and ancient) scientific enquiry or the parallel traditions of magic.

The 'Beest' that arrives in Anne's home seems to provide its own, personalised solution to the issues of her environment's complex systems: a way not only to 'View' the 'Troth' that underlies existence, but to control it, as well. While the creature has the form, and many of the

²⁴⁹ Parry, Ross, 2010, p. 261.

²⁵⁰ Dix, Alan *et al.* 2004, p. 232.

²⁵¹ Penny, Simon, 2016, p.61.

trappings, of the 'familiar spirits' of witches and cunning folk in previous centuries²⁵², the 'Beest' seems to be divested of many of the more troublesome, naturalistic qualities of the beings that populated 18th century rural life; whether the moods of ornery cattle or the untameable predilections of supernatural entities. Anne writes in glowing terms of the 'Beest's' calm, compliant, almost-robotic behaviour, and plots the unerring predictability of its function and form. She insists that it has no desires, no wants, no 'Lusts' of its own; indeed no character, except that of a mechanomorphic servant.

Its only purpose is to 'Work' infallibly, with no 'froth[ing]... or Protest'; to be manipulated, like the 'stations' at Mr. Knole's mill, in a sequence of unambiguous actions designed for specific ends. Anne terms such actions and ends her 'Method' - a set of simple, algorithmic 'operaytings' of the Beest which she has developed to allow her to influence, and instrumentalise, the naturalistic chaos of 'GRAVITAS' which has previously ruled her life, and the lives of her peers. When Anne states that the creature is the 'Consoal 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.

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'²⁵³; 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 centuries²⁵⁴, 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'.

²⁵² Wilby, Emma, 2000.

²⁵³ Vella, Daniel, 2015.

²⁵⁴ 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: Palgrave Macmillan, 2016, pp. 173 – 189.

In the context of the burgeoning Enlightenment, and the coming Industrial Revolution (see Chapter 3), Anne's 'Newly Beest, some Beest verie Perfectt' seems more like a computer, with its logical systems and algorithmic operations, than a 'Beest' at all; indeed, Anne hopes that it is the first of many such 'Beests', in a 'Newly Age' of honest work, mechanised predictability, denatured 'Troth' and control.

Of course, not everybody in Anne's 'storyworld' shares her utopian, utilitarian views. In the ballad which is included with the *Housekeeping*, supposedly penned by a poor shepherd, or 'goodly Christian Witness' to Anne's growing notoriety, we are given another perspective on the 'Beest' and its work; a 'false Virtual', designed only to ensnare the foolish and the blasphemous. The writer of the ballad pours scorn on those who climb to the village of Nighthead to buy the spells and charms created by Anne and her Beest; characterising them as dupes falling for a clever trick that is fundamentally disconnected from the real world: a world full of analogue complexity, difficulty and God-given hardship. To place one's faith in something which appears to simplistically delineate the secret processes which underlie existence is, in the 'Witness's words, like seeking 'the warmth without the fyre'.

Indeed, considering Anne's eventual fate, it could be argued that this 'formality gap' between the reality of the 'Beest' and its work, and Anne's perceptions of it, is just too great to be overcome. Even in her final moments as the famed 'Wyfe of Nighthead' - shunned by the county, embroiled in scandal and rumour, her own rituals failing to prevent an unexpected pregnancy, Anne continues to believe in the revolutionary nature of her 'Work', and the creature which is its engine. 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'. To the very end, it might be argued,

Anne never overcame or tamed the complexity of the world: she merely reductively ignored it.

* * * * *

The similarities between Anne's particular conception of the 'Beest' and modern computers is not, of course, accidental. Just as the 'Beest' supposedly provides a meaningful, operable interface with the *functionality* of the world, so does narrative comp-art attempt to provide a procedural interface between the audience and a storyworld's characters, using the paradigm of digital computing. Unlike other narrative artforms, which hinge on static reproductions of certain elements of personhood, comp-art seeks to meaningfully *simulate* personhood; that is, to demonstrate something, through its 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'²⁵⁵: the embodied 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; the audience receives, responds and shapes. In each case, as Ken Perlin points out²⁵⁶, it is the human mind which undertakes this calculation; a tool evolved to execute these 'complicated recursive systems'²⁵⁷, the 'subjectively ambiguous'²⁵⁸, instinctive and often ineffable processes by which beings function; processes such as social conflict²⁵⁹, learning and emotion, 'interpersonal relationships'²⁶⁰

²⁵⁵ Oatley, Keith, 2008.

²⁵⁶ Perlin, Ken 'Can There Be A Form Between Game And Story?'. In: Wardrip-Fruin, Noah and Harrigan, Pat (eds.), 2004.

²⁵⁷ Hofstadter, Douglas, *Godel, Escher, Bach: An Eternal Golden Braid*. London: Penguin, 2000, p. 152.

²⁵⁸ Hugill, Andrew and Yang, Hongi 'The creative turn: New challenges for computing'. *International Journal of Creative Computing* 1 (1), 2013, pp. 1 – 15, p. 1

²⁵⁹ Salen, Katie and Zimmerman, Eric, 2004, p.382.

²⁶⁰ 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. 50.

and 'internal mental... action' - the elements, in short, of drama²⁶¹ - whose modelling forms the elusive objective of many disciplines, sciences and enquiries.

When this 'qualitatively variable'²⁶² 'squishy stuff'²⁶³, as Falstein calls it, is instead (in part) parsed through the rigid, 'objectively precise'²⁶⁴ and 'quantitatively controlling'²⁶⁵ machine, operated by the flow of electricity through integrated circuitry controlled by transistors which can perform binary logic operations on binary data, the fundamental differences between these two types of system become painfully apparent. 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. Douglas Hofstadter, in his early philosophical consideration of natural and artificial intelligence, maintains a 'reductionist faith'²⁶⁶ that computers can be used to imitate, in a functionally meaningful way, the 'incalculability of life'²⁶⁷ through a meaningful 'simplification... [of] real-world ideas'²⁶⁸; 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 'mechanizability'²⁶⁹ of intelligence – of personhood – is possible, and those who do not. 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, 'there is a long road ahead'²⁷⁰. The length of that road, especially for an impatient artist, remains frustratingly obscure.

²⁶¹ Ryan, Marie-Laure, 2001.

²⁶² Hugill, Andrew and Yang, Hongji, 2013, p. 1

²⁶³ Koster, Raph, 2018.

²⁶⁴ Hugill, Andrew and Yang, Hongji, 2013, p. 2.

²⁶⁵ Ibid.

²⁶⁶ Hofstadter, Douglas, 2000, p. 572

²⁶⁷ Murray, Janet, 1997, p. 297.

²⁶⁸ Gard, Toby *Building Character*, 2000 [Online]. Available at: <https://www.scribd.com/document/321423675/Toby-Gard-2000-Building-Character> [Accessed 8th August 2018].

²⁶⁹ Hofstadter, Douglas, 2000, p.58.

²⁷⁰ Hofstadter, Douglas, 2000, p. 573.

It is in reconciling this 'formality gap'²⁷¹ – in meaningfully representing the systemic procedurality of characters as 'non-actual' persons with 'vast[ly] discrepan[t]'²⁷² computational tools – that remains the greatest formal challenge to realising truly resonant computational characters as this thesis defines them²⁷³. It is from this discrepancy that much of the lack of resonance in such characters – their 'narrative dissonance'²⁷⁴, frequent charges of 'ludological centrism'²⁷⁵, their lack of believability, depth, subtlety, complexity – has arisen. Often, in works of narrative comp-art, 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'²⁷⁶, that one of my study participants labelled as the 'pressures of the medium': and it is these pressures which have in part informed the various artistic, critical and methodological discourses of comp-art culture, the 'external affordances of the discipline'²⁷⁷ and the 'changing political, social, and cultural contexts in which they are produced and consumed'²⁷⁸. In the mainstream videogame industry, perhaps the most common source of narrative characterisation in 'comp-art', and most influential on tangential disciplines (see Appendix 5), these limitations have contributed to a cyclical *status quo* of risk aversion, narrative conservatism and stagnation; '[the] ringing [of] changes on the same few subjects', methodologies, characters and their fictions²⁷⁹, a 'downgrad[ing]' of narrative sophistication and its implementation

²⁷¹ Dix, Alan *et al.* 2004, p. 232.

²⁷² Norman, Donald, 2007.

²⁷³ Ryan, Marie-Laure 'From Playfields To Fictional Worlds: A Second Life for Ariosto'. *New Literary History* 40 (1), 2009, pp.159 – 177.

²⁷⁴ Seraphine, Frederic, 2016.

²⁷⁵ Cășvean, Tulia Maria 'What is Games Studies Anyway? Legitimacy of Game Studies Beyond Ludo-centrism vs. Narrato-centrism Debate'. *Revista Româna de Jurnalism și Comunicare* 11 (1), 2016, pp. 48 – 59.

²⁷⁶ 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].

²⁷⁷ Copplestone, Tara, 2017, p.88.

²⁷⁸ Kerr, Aphra. *The business and culture of digital Games: Gamework/gameplay*. London: Sage, 2006, p. 4.

²⁷⁹ *Ibid.*

computationally²⁸⁰, and an underdevelopment of tools and techniques for addressing computational character: even a bizarre and defeatist surfeit of self-reflexive 'in-jokes' and indulgent neoteny about those very inadequacies²⁸¹. 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 resonant character does not achieve that resonance primarily through computation.

Anne's utopian conception of her 'Beest' - as a manageable, predictable and ultimately mechanomorphic being shorn of any Personality, a 'vending machine'²⁸² for particular purposes and uses – is matched by 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 in deficient practices of 'technological reductionism'²⁸³, with a focus on the 'low-hanging fruit' of simulation²⁸⁴ and 'mechanical parody'²⁸⁵.

Examples of such approaches include mechanistic and reductive depictions of romance and social interactions; frustratingly stupid 'companion' characters²⁸⁶; frequent 'glitches' or incoherences in

²⁸⁰ Newman, James, 2002.

²⁸¹ Williamson, Alan 'Yokosuka, 1986'. *Five Out of Ten* 3 (1), 2014.

²⁸² 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].

²⁸³ Ruffino, Paolo 'Narratives of independent production in video game culture'. *Loading...* 7 (11), 2012, pp.106 – 121.

²⁸⁴ Koster, Raph *et al.*, 2018.

²⁸⁵ Weizenbaum, Joseph *Computer Power and Human Reason: From Judgement to Calculation*. San Francisco: W.H. Freeman, 1977, p. 9.

²⁸⁶ Tremblay, Jonathan 'Improving Behaviour and Decision Making for Companions in Modern Digital Games'. *AIIDE 2013: AAAI*, 2013.

computational representations of character²⁸⁷; the vast number of 'utilitarian [and] transactional' conversation models²⁸⁸; and the crude 'moral calculus'²⁸⁹ and 'predictable, solvable problems'²⁹⁰ of simulations of social reputation, romance, persuasion and faction politics 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*²⁹¹ 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*²⁹².

In such cases, while characterisation is attempted through systemic means, the resulting characters function 'simpl[y] and dispensibl[y]'²⁹³, with little computational exploration of any inner, interpersonal life or its 'unique, complex circumstances'²⁹⁴. They serve as little more than 'props'²⁹⁵ and 'mere decoration',²⁹⁶ 'artificial constructs' or 'puppets'²⁹⁷, 'equipment to be utilised'²⁹⁸ in the pursuit of less personalised and more 'effectively computable'²⁹⁹ functionalities within 'misleading and impoverished social and cultural worlds'³⁰⁰. These functionalities include more 'tightly constrained domains'³⁰¹: the 'quantifiable outcomes'³⁰² and 'challenge-based' goals and 'flows'³⁰³ of

²⁸⁷ 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.

²⁸⁸ Bell, Alice *The Fuckeduplet 1: Dialogue in Games is Fucked - Alice Bell*. Videobrain, London, 2016 [Online]. Available at: <https://www.youtube.com/watch?v=nWD6bb3AbS8> [Accessed: 8th August 2018].

²⁸⁹ Champion, Erik, 2004.

²⁹⁰ Kopas, Meritt *Soft Chambers*, 2015 [Online]. Available at: <http://softchambers.com/> [Accessed 8th August 2018].

²⁹¹ Might & Delight, 2013.

²⁹² Bethesda Softworks, 2011.

²⁹³ Ryan, Marie-Laure 'Interactive Narrative, Plot Types & Interpersonal Relations'. *Intersemiose* 2 (4), 2013, pp. 26 - 37, p. 30.

²⁹⁴ Anthropy, Anna and Clark, Naomi, 2011, p. 185.

²⁹⁵ Koster, Raph *et al.*, 2018.

²⁹⁶ Machidon, Octavian *et al.*, 2016, p. 250.

²⁹⁷ Salen, Katie and Zimmerman, Eric, 2004, p.446.

²⁹⁸ Newman, James, 2002.

²⁹⁹ Finn, Ed *What Algorithms Want: Imagination in the Age of Computing*. Massachusetts: The MIT Press, 2017, p. 42.

³⁰⁰ Champion, Erik, 2015

³⁰¹ Winston, Patrick 'AI memo no. 366'. [Technical Report]. Massachusetts: MIT, 1976.

³⁰² Salen, Katie and Zimmerman, Eric, 2004, p.93.

³⁰³ Cowley, Ben *et al.* 'Towards an understanding of flow in video games'. *Computers In Entertainment* 6 (2), 2008, pp. 20:1 – 20:27.

'ludic' or skill-based contests³⁰⁴; the constructive, 'sandbox' elements of paidic play³⁰⁵; formalist and less character-centric narrative structures; and the 'kinaesthetic'³⁰⁶, 'spatial... temporal relations'³⁰⁷ used to represent Euclidian space; most often, as in Anne's conceptual universe, focussed on gravity and its various employments. Such focuses are reinforced and informed by other reductive practices: the prevalence of dehumanising interaction models, particularly through combat mechanics; an undervaluing of opacity, ambiguity and ineffability in computational representative systems in favour of 'goal-related engagement'³⁰⁸; and the over-emphasis of an audience's instrumental agency, which serves to 'fetishize control'³⁰⁹; emphasising reactivity and 'immediate response'³¹⁰ over passivity, unpredictability or introspection.

Represented characters in such works – iconified³¹¹, 'dumb[ed] down'³¹², transparent - often demonstrate a clear and 'dissonant'³¹³ space between their 'non-actual'³¹⁴ personhood and their reductive representation. The communication between artefact and the experience of that artefact *as a person* – 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'³¹⁵ of characterisation as a form of self-reflexivity or metalepsis, 'critiqu[ing or] subvert[ing]... the

³⁰⁴ Calleja, Gordon, 2011, p. 52.

³⁰⁵ Iversen, Sara Mosberg. 'Between Regulation and Improvisation: Playing and Analysing "Games in the Middle"'. [PhD Thesis]. IT University of Copenhagen, 2009, p. 77.

³⁰⁶ Calleja, Gordon, 2011, p. 55.

³⁰⁷ Gernsbacher, Morton Ann *et al.*, 'Do Readers Mentally Represent Characters' Emotional States?' *Cogn Emot* 6 (2), 1992, pp. 89-111, p.104.

³⁰⁸ Lankoski, Petri 'Player Character Engagement in Computer Games'. *Games & Culture* 6 (4), 2011, pp. 291 – 311, p. 291.

³⁰⁹ Galloway, Alexander, 2006, p.93.

³¹⁰ Ryan, Marie-Laure, 2001.

³¹¹ Majewski, Jakub, 2015, p.2.

³¹² Roberts, David *et al.* 'Beyond Adversarial: The Case for Game AI as Storytelling'. *Proceedings of DiGRA 2009*. DiGRA, 2009.

³¹³ 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].

³¹⁴ Margolin, Uri, 1987, p. 110.

³¹⁵ 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.

original function of the appropriated technology'³¹⁶ in order to express particular artistic agendas. A recent example of this applied to characterisation is Jimmy Andrews' and Loren Schmidt's *Realistic Kissing Simulator*³¹⁷, 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 act. For some, these works are an important avant-garde³¹⁸: for others, they are a 'reactionary'³¹⁹ 'reinforcing [of] the... monoculture'³²⁰ which ultimately 'devolves into conceptualism'³²¹ rather than tackling problems of characterisation directly.

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 which champion artworks as 'imaginative acts'³²², 'manifest through experiential effects'³²³. They are works of narrative comp-art, with their attendant characterisations, which do not centre on systemics, but rather the 'surface signs'³²⁴ of the mediated, 'embedded'³²⁵ mimetic. Such works are more static than procedural, having more in common with 'radio plays'³²⁶ or novels³²⁷, the computation (as in traditional works) offloaded onto the augmentative platforms of their

³¹⁶ Kroos, Christian 'The Art in the Machine'. In: Herath, Damien *et al.*, 2016 pp. 19 – 25, p. 25.

³¹⁷ Andrews, Jimmy and Schmidt, Loren *Realistic Kissing Simulator* [Online]. Available at: <http://jimmylands.com/experiments/kissing/> [Accessed 8th August 2018].

³¹⁸ Schrank, Brian *Avant-Garde Videogames: Playing with Technoculture*. Massachusetts: The MIT Press, 2014.

³¹⁹ Galloway, Alexander, 2006, p.125.

³²⁰ McMaster, Michael *Against Introspection: A speculative manifesto*, 2017 [Online]. Available at: <http://michaeljcmaster.com/writing/Against%20Introspection%20-%20Michael%20McMaster.pdf> [Accessed 8th August 2018].

³²¹ Bogost, Ian, 2017.

³²² 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].

³²³ Salen, Katie and Zimmerman, Eric, 2004, p. 323.

³²⁴ Aarseth, Espen, 1997, p.29.

³²⁵ 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.

³²⁶ 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].

³²⁷ Galloway, Alexander, 2014.

audience's embodied minds, and their faculties of 'projection'³²⁸, experiential modelling³²⁹, 'illusion'³³⁰, 'interpretative affordances'³³¹ and other psychological/physiological abilities³³²³³³. To such artists, these tools are far more powerful than the material technologies provoking them³³⁴.

Examples of such approaches include the trope of the cutscene³³⁵ in videogames; the use of fixed narrative elements to contextualise emergent, abstract gameplay, as in Mike Bithell's *Thomas Was Alone*³³⁶; the use of depopulated environments and objects to explore and embody personhood through 'environmental storytelling'³³⁷; the 'illusion of intelligence'³³⁸ in videogames and robotic art such as that of Edward Ihnatowicz³³⁹ and Simon Penny³⁴⁰; the use of 'negative agency'³⁴¹, 'expressive acts'³⁴², the 'reflective choice'³⁴³, the 'illusion of agency'³⁴⁴ or choice³⁴⁵ and other 'apparent'³⁴⁶ narrative emergences which serve to give audiences a sense of computational 'resonance' without practically encoding it. Such an approach questions whether resonant characters in

³²⁸ Mateas, Michael 'Expressive AI: Games and Artificial Intelligence'. *Proceedings of Level Up: Digital Games Research Conference*. DGRC: Utrecht, 2003.

³²⁹ Salen, Katie and Zimmerman, Eric, 2004, p. 323.

³³⁰ Laurel, Brenda, 1993, p. 35.

³³¹ Mateas, Michael, 20021, p. 148.

³³² Madigan, James, 2016.

³³³ 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].

³³⁴ 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.

³³⁵ Klevjer, Rune 'Cut Scenes'. In: Ryan, Marie-Laure *et al.* (eds.), 2014, p. 106.

³³⁶ Bithell, Mike, 2012.

³³⁷ Calleja, Gordon, 2011, p.119.

³³⁸ 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.

³³⁹ Glynn, Ruairi 'Edward Ihnatowicz – The Senster', 2008 [Online]. Available at: <http://www.interactivearchitecture.org/edward-ihnatowicz-the-senster.html> [Accessed 8th August 2018].

³⁴⁰ Penny, Simon *Petit Mal*, 2006 [Online]. Available at: <http://simonpenny.net/works/petitmal.html> [Accessed 8th August 2018].

³⁴¹ Kabo Ashwell, Sam, 2014.

³⁴² Galloway, Alexander, 2004, p.2.

³⁴³ Anthropy, Anna and Clark, Naomi, 2011, p. 177.

³⁴⁴ 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.

³⁴⁵ 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].

³⁴⁶ Tronstad, Ragnhild, 2014, p. 181.

comp-art need to be computational at all: however, as Ryan and others have pointed out over the last two decades³⁴⁷, if such reliance on mimetic rather than systemic engagement is not managed well, relying instead on 'clever but shallow trickery'³⁴⁸ or 'swindles'³⁴⁹, it can merely throw into sharper relief the deficiency of the computation beneath.

* * * * *

My critiques above are not designed to be dismissive. All of the works that I have cited above are genuine attempts by talented commercial producers, independent artists and critical theorists alike to confront the formal challenges of computational characterisation, and work towards the murky shibboleth, and illusory poster child, of narrative comp-art's 'particular'³⁵⁰ potential: a character that is both computational and resonant.

The qualities of such a character lie somewhere in the balance between Oatley's two forms of computation³⁵¹; between comp-art's universal and 'particular' tenets; between the 'surface signs'³⁵² of mimesis and the 'modelling [of] systems'³⁵³ as complementary 'sources of meaning'³⁵⁴ and 'means of expression'³⁵⁵. Determining the proper balance or 'blend of human and computer meanings'³⁵⁶ - between 'animism, artistry and AI'³⁵⁷ 'computer logic and human logic'³⁵⁸, 'interpretative' and 'authorial affordance[s]', 'meaning making and machine structure'³⁵⁹ – remains both a 'common fantasy' and a

³⁴⁷ Ryan, Marie-Laure, 2001.

³⁴⁸ Bringsjord, Selmer, 2001.

³⁴⁹ Ashwell, Sam Kabo, 2014.

³⁵⁰ Keogh, Brendan, 2015.

³⁵¹ Oatley, Keith, 2008.

³⁵² Aarseth, Espen, 1997, p. 29.

³⁵³ Bogost, Ian, 2017.

³⁵⁴ Vella, Daniel, 2015.

³⁵⁵ Wardrip-Fruin, Noah, 2009, p. 295.

³⁵⁶ Norman, Donald, 2007.

³⁵⁷ Frude, Neil and Jandric, Petar "The Intimate Machine" – 30 Years On'. *E-Learning and Digital Media* 12 (3-4), 2015, pp. 410 – 424.

³⁵⁸ Dix, Alan *et al.*, 2004,

³⁵⁹ Mateas, Michael, 2001, p. 151.

'common nightmare' within comp-art³⁶⁰. Whether commercial or artistic, common or 'radical'³⁶¹, such approaches all stand as attempts to reconcile these 'deliciously difficult'³⁶² and 'worthy problem[s]... in desperate need of further examination'³⁶³.

³⁶⁰ 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].

³⁶¹ Galloway, Alexander, 2006, p.125.

³⁶² Zimmerman, Eric, 2014.

³⁶³ Bailey, Christine *et al.* 'Believability Through Psychosocial Behaviour: Creating Bots That Are More Engaging and Entertaining'. *In*: Hingston, Peter (eds.) *Believable Bots*. Berlin: Springer, 2012, pp. 29 – 70, p. 29.

"Hollow Forms"

The Autocosmic Philosophy & Its Application To Computational Character

Section 2.1: Some Approaches To Overcoming The Challenges Of Computational Character

In order to approach and mediate these central challenges to creating 'resonant' computational characters, my 'critical technical practice'³⁶⁴ and practice-based research has come to rely on a number of existing methodologies from across the working cultures of the form.

1) Formal approaches to computational characterisation.

knole's development included numerous investigations into the landscape of technologies (whether hardware or software) that could be applied to acts of computational characterisation. Fully 75% of my study group saw technical improvements as being the most important factor in improving computational characters, including machine learning and neural network techniques, natural language processing, affective and biofeedback techniques, innovative input and output devices, new software tools for AI, and academic models of artificial intelligence that are still making in-roads into consumer and artistic spheres.

The final iteration of the simulation is based on several overlain considerations of these technological approaches. These considerations include 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' cultures³⁶⁵ is actually evidence of 'technical

³⁶⁴ Mateas, Michael, 2002, p. ii.

³⁶⁵ 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]

progress outstrip[ping] aesthetic progress'³⁶⁶, damaging the 'visionary impulse'³⁶⁷ that must guide narrative art, and standing as evidence of an immature practice seeking 'scientific curiosity [rather than] creative enterprise'³⁶⁸.

Through such study and critical thinking, I curated 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 engine³⁶⁹, mostly used for simple 2D platformer games; even its suitability in that regard, in competition with other, more advanced platforms, is often debated. 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: I have used the tool extensively in past work, and committing to learning a more advanced tool like Unity³⁷⁰, 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.

³⁶⁶ 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].

³⁶⁷ Mery, David 'Hedging your bets', *EXE Magazine*, August 1999 [Online]. Available at: <https://gizmonaut.net/soapflakes/EXE-199908.html> [Accessed 20th June 2020].

³⁶⁸ Mullaney, Brett, 2013.

³⁶⁹ YoYo Games *Gamemaker*, 2018 [Online]. Available at: <https://www.yoyogames.com/gamemaker> [Accessed 8th August, 2018].

³⁷⁰ Unity Technologies *Unity*, 2019 [Online]. Available at: <https://unity3d.com/> [Accessed 8th August 2018].

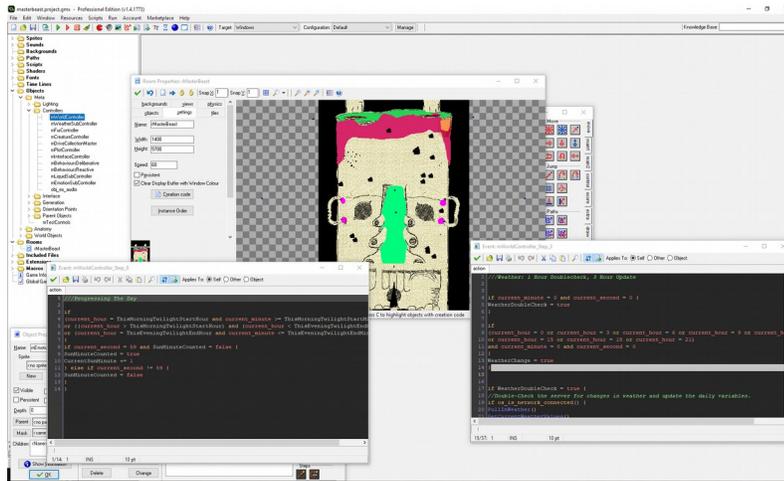


Figure 4: A view of the Gamemaker project for the simulation, with several of the scripts visible³⁷¹.

Despite the simulation being implemented little differently from the simple 'model-based reflex agents'³⁷² that have dominated academic and artistic approaches to computational character for decades (see Chapter 3.5), 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 tailored approach upon them. Thus the simulation is heavily based on Joanna Bryson's Behaviour-Oriented Design framework³⁷³, a fifteen-year-old AI architecture (derived from yet-older models) which combines systemic agency with the mechanics of audience engagement, and is already very popular in games development. I modified Bryson's original specification slightly by incorporating elements from other work, both new and old, on emotion, attention, utterance, personality and other elements of agent-based systemics (see Chapter 3). I also experimented with several other 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 Item 4 below).

³⁷¹ See Appendix 9, Figure 18.

³⁷² Russell, Stuart and Norvig, Peter, 2009, p. 47

³⁷³ Bryson, Joanna J. 'The Behavior-Oriented Design of Modular Agent Intelligence'. In: Kowalszyk, R. et al. (eds.) *Agent Technologies, Infrastructures, Tools, and Applications for e-Services*. London: Springer, 2003, pp. 61–76.

2) Eschewing sophisticated visual representation.

knole is not a demonstration of the 'increasingly visceral representational technologies'³⁷⁴, whether in pursuit of graphical realism³⁷⁵³⁷⁶ or stylised visual aesthetics³⁷⁷, that continue to define computational character - particularly in videogames and even outside of the 'AAA production space'³⁷⁸. The visual design of the simulation does have some relevance to its narrative 'resonance' – a layered and textured 2D effect that is designed to reproduce the effect of paper, as a commentary on how contemporary media doubted the veracity of Anne's 'Beest' and its practices, as well as to mirror the print cultures that influenced the project's form (see Chapter 3.6) Also to consider were the pragmatics of development time, my own artistic ability, and the lack of a budget for working collaboratively with a visual artist. However, the 'Beest's' visual simplicity also serves as a stance on the ever-increasing focus, within comp-art, on the 'uncritical uptake'³⁷⁹ of representational fidelity. Such fidelities are often at the expense of the wider variety of experiences and representations important to comp-art, particularly that of the systemic, and are said to damage those resonances through over-ambition or unfavourable comparison. knole tries to focus its audience's attention on its systemic resonances of dynamic agency, and demonstrate their importance over any supposed visual realism.

3) Smaller or more considered scales of narrative experience.

knole takes as its computational focus a single character, in face-to-face confrontation with the audience, drawing on trends of

³⁷⁴ Murray, Janet, 1997, p. 28.

³⁷⁵ Grau, Oliver, 2003.

³⁷⁶ Bogost, Ian, 2015.

³⁷⁷ Thibault, Mattia *Post-digital games: The Influence of Nostalgia in Indie Games' Graphic Regimes'*. *Gamevironments* 1 (4), 2016, pp. 1 – 24.

³⁷⁸ McMaster, Michael *On Formalism*, 2014 [Online]. Available at: <https://medium.com/@michaeljmcmaster/on-formalism-a1b4e95bb435> [Accessed 8th August 2018].

³⁷⁹ Keogh, Brendan, 2014.

'vignette'³⁸⁰³⁸¹ works which seek to 'ratchet the scenario down'³⁸² from vast, open-world affairs with much breadth but little depth to pinpoint artistic efforts in the meaningful and deeper portrayal of interactions between small groups of characters in bounded narrative spaces. Illustrative examples of this include the previously-mentioned *Facade*³⁸³, Jeroen Stout's 'interactive theater' work *Cheongsam*³⁸⁴, and Emily Short's *Galatea*³⁸⁵³⁸⁶.

4) The 'mixed reality'³⁸⁷ dynamic.

On a pragmatic, as well as a narrative level (see Chapter 3), Project *knole* was an experiment in using 'mixed reality' techniques and the 'post-PC... bodily turn'³⁸⁸, well-established across comp-art, to help drive my characters' 'resonance'. I did this by turning a physical space into a 'mixed experiential space'³⁸⁹; using the modalities of that space in conjunction, or 'hybridity'³⁹⁰, with the 'virtual world'³⁹¹; and leading the audience to a narrative, character-led experience through a wide range of input devices and physical props, augmented by their phenomenological experience of their own bodies in space.

The Project uses these natural faculties of enactment, 'body centred interaction'³⁹², sensory stimulation, proxemics, posture,

³⁸⁰ 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].

³⁸¹ Koentiz, Hartmut, 2015, p. 54.

³⁸² 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=5o8QS_5oPUs [Accessed 8th August 2018].

³⁸³ Mateas, Michael and Stern, Andrew, 2005.

³⁸⁴ Stout, Jeroen *Cheongsam*, 2018 [Online]. Available at: <http://stoutgames.com/:cheongsam> [Accessed 8th August 2018].

³⁸⁵ Short, Emily *Galatea* [PC Software], 2000, [Online]. Available at: <https://ifdb.tads.org/viewgame?id=urxrv27t7qtu52lb> [Accessed 8th August 2018].

³⁸⁶ Dias, Bruno. 2016.

³⁸⁷ Benford, Steve and Giannachi,

³⁸⁸ 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.

³⁸⁹ Doyle, Denise 'Immersive storytelling in mixed reality environments'. *Proceedings of the 23rd International Conference on Virtual System and Multimedia (VSMM)*. Dublin: IEEE, pp. 1-4.

³⁹⁰ Keogh, Brendan *A Play of Bodies: How We Perceive Videogames*. Massachusetts: The MIT Press, 2018, p. 54.

³⁹¹ Benford, Steve and Giannachi, Gabriella 'Interaction As Performance'. *IXI* 19 (3), 2012, pp. 38 – 43.

³⁹² Slater, Mel and Usoh, Martin 'Body Centred Interaction in Immersive Virtual Environments'. *Artificial life and virtual reality* 1 (1), 1994, pp. 125-148.

embodied environmental factors, ‘physical bodies and how they are represented’³⁹³ - in short, active presence, the ‘user’s sense of *being there*’³⁹⁴ - to provide its audience with multiple ‘resonant’ pathways, or ‘trajectories’³⁹⁵, into, through and out of their encounter. It co-opts those sensory and embodied modalities through which persons are most typically encountered, and thus facilitates identification, transportation, ‘social involvement’³⁹⁶, immediacy, intimacy and metalectical, thematic consideration precisely through the resonant power of those modalities. I explore more-specific uses of the mixed reality dynamic in Chapter 3.7 of this thesis.

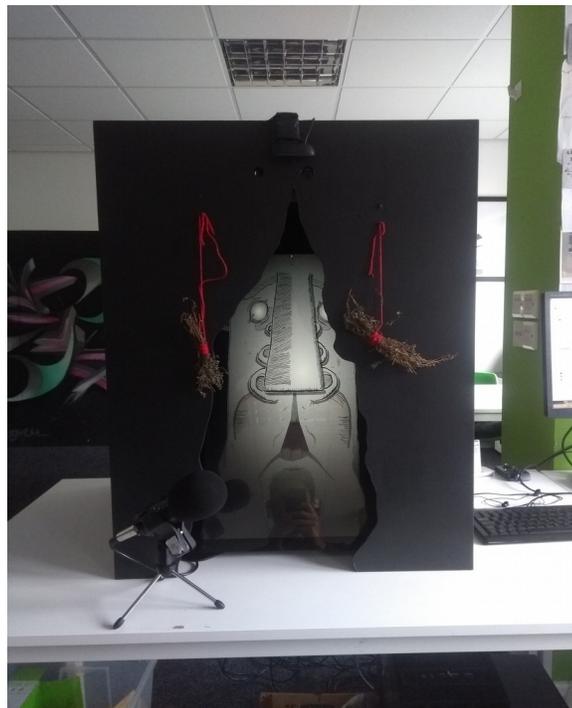


Figure 5: Some of the technologies, spatial devices and physical sets used to facilitate the installation’s ‘mixed reality’ dynamic. They include multiple cameras, a microphone, a physical representation of the ‘Beest’s’ containing ‘fisure’, and a large touchscreen³⁹⁷.

³⁹³ Calvi, Licia and Spence, Jocelyn ‘Engaging Audiences in Museums in a Performance Way’. *Proceedings of the Digital Research in the Humanities and Arts Conference*, 2014, pp. 131 – 145, p. 134.

³⁹⁴ 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.

³⁹⁵ Benford, Steve and Giannachi, Gabriella, 2011.

³⁹⁶ Calleja, Gordon, 2011, p. 38.

³⁹⁷ See Appendix 9, Figure 8a.

5) Systemic Approaches To Computational Design.

knole is particularly indebted to the trend of 'systemic' design³⁹⁸ and 'cybernetic thinking'³⁹⁹ within narrative comp-art, particularly in videogames practice: a practice which draws on concepts from information theory, complexity theory and computer science more broadly to attempt the building of procedural systems, with varying levels of depth, emergence and autonomy, which systemically represent meaningful functionalities of narrative worlds and their existents. 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 narrative⁴⁰⁰. 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'⁴⁰¹.

Such approaches can be seen in the high school social simulator *Prom Week*⁴⁰²; in Ian Cheng's simulation work⁴⁰³; in the 'fantasy world simulator [and] storytelling engine'⁴⁰⁴ *Dwarf Fortress*; and in Emily Short's continuing work on 'tighten[ing] the world-plot interface' through systemic design of conversations, dramatic scenarios and social relationships⁴⁰⁵. Even in the consumer space, ambitious works such as

³⁹⁸ Sellers, Mike *A Systemic Approach To Systemic Design*, 2015 [Online]. Available at: <https://www.youtube.com/watch?v=HR8EmTyJz9A> [Accessed 8th August 2018].

³⁹⁹ Bown, Oliver *et al.* 'The Machine As Autonomous Performer'. In: Candy, Linda and Ferguson, Sam (eds.) 2014, p. 76.

⁴⁰⁰ Koenitz, Hartmut, 2016, p.52.

⁴⁰¹ Calleja, Gordon, 2011, p. 6.

⁴⁰² UCSC *Prom Week*, 2012 [Online]. Available at: <https://promweek.soe.ucsc.edu/play/> [Accessed 8th August 2018].

⁴⁰³ Cheng, Ian, 2018.

⁴⁰⁴ 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].

⁴⁰⁵ 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].

*Alien: Isolation*⁴⁰⁶, *Middle Earth: Shadows of War*⁴⁰⁷ and *The Last Guardian*⁴⁰⁸ have been praised for their focus on strong character representation through complex, simulatory systems, produced using authored, innovative application of 'tried and tested' approaches rather than technical wizardry⁴⁰⁹. 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 complex modular systems, governing the 'Beest's' emotions, behaviours, personality and memory, to produce emergent behaviours and reactions to audience interaction and other inputs: crafting a subtle, systemic representation of narratively significant personhood.

* * * * *

While these existing methodologies have provided me with robust starting points for tackling the problems of computational character, as I perceive them, my work on `knole` has been centred on another approach entirely. In the next section, I will outline this approach, which I term the 'autocosmic'; as a design philosophy which looks beyond the specific qualities of computational art, or even those of fictional characters in *any* form of art, to a broader, more interdisciplinary consideration of what we perceive a 'person' to be — fictional or not. It is in this reconsideration that new approaches to the design of computational character reveal themselves.

⁴⁰⁶ Creative Assembly *Alien: Isolation* [PC Software]. UK: Sega, 2014.

⁴⁰⁷ Monolith Productions *Middle Earth: Shadows of War* [PC Software]. US: Warner Bros. Interactive, 2017.

⁴⁰⁸ SIE Japan Studio *The Last Guardian* [PS4 Software]. Japan: Sony Interactive Entertainment, 2016.

⁴⁰⁹ 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].

Section 2.2: The Autocosmic Philosophy

The 'autocosmic' design philosophy has its roots in the 'post-classical'⁴¹⁰ turn in narratology and many of its associated disciplines, explored in the introduction of this thesis. In its exemplars, such as audience response theory, the significances of artistic production are not centred solely in the form or content of the work, but in that form's and content's engagement with the constructive, augmentative imaginations of the audience. It is from this paradigm that I derive my evaluative definition of 'resonance', and my definition of a character as a perceived person rather than a pure textual construct.

Of course, this focus on the artefact's effect on the imagination is not a new development in aesthetic theory. Since Plato and Aristotle's early formalisations⁴¹¹⁴¹², this 'imaginative activation'⁴¹³, as a 'constructive... act'⁴¹⁴ has been extensively explored. In more recent scholarship, numerous theories have approached this topic with academic rigour, exploring how audiences become 'immersed'⁴¹⁵, 'absorbed'⁴¹⁶, 'transported' or 'involved'⁴¹⁷ in the lives of fictional characters; how they 're-center'⁴¹⁸ 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.

⁴¹⁰ Mani, Inderjeet, 2013.

⁴¹¹ Plato, Benjamin Jowett (trans.) *Ion: The Internet Classics Archive*, 2009 [Online]. Available at: <http://classics.mit.edu/Plato/ion.html> [Accessed: 18th August 2018].

⁴¹² Aristotle, 1996.

⁴¹³ Wolf, Werner, 2011, p.9.

⁴¹⁴ Oatley, Keith 1999.

⁴¹⁵ Ryan, Marie-Laure *Possible Worlds, Artificial Intelligence and Narrative Theory*. Bloomington: U of Indiana P, 1991.

⁴¹⁶ 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.

⁴¹⁷ Green, Melanie *et al.* 'Understanding Media Enjoyment: The Role of Transportation Into Narrative Worlds'. *Communication Theory* 4 (3), 2004, pp.311-327.

⁴¹⁸ Ryan, Marie-Laure, 1991.

The *fact* of the imagination is, in such discourses, rarely debated. However, there often exists a variety of conceptions as to the *nature* of those imaginings; whether or not the mental simulation of fictive events, and persons, is *typally different* from the other purviews of the imagination; the 'related states in real life'⁴¹⁹ such as counterfactual and hypothetical thinking, 'conceptual and perceptual errors', religious and superstitious experiences, the mental representation of real social relationships, 'illusory and hallucinatory phenomena'⁴²⁰ and the 'vast dynamic world of impulse and dream'⁴²¹ which is the preserve of unaestheticised mental life.

* * * * *

The traditional view, in evidence across many different artforms (including comp-art), bifurcates the human imagination thus, framing audience's responses to fictive worlds as 'illusionist'⁴²²; that is, as 'aesthetic illusion'⁴²³. These are 'basically pleasurable mental state[s]'⁴²⁴, in which audiences, during the act of reception, 'experience the [storyworld] in a way similar... to real life'.⁴²⁵ Often, they can be extremely immersive experiences, with a high degree of verisimilitude as regards similar, real-life scenarios; sometimes, the line between real and fictional can even be 'temporarily overwhelmed'⁴²⁶. However, it is theorised that audiences always maintain a 'latent'⁴²⁷ or 'aesthetic' distance⁴²⁸, aware that what they are viewing is mimetic - a representation of reality only - and parse such experiences with typally different mental apparatus. This has been called, variously, a 'willing

⁴¹⁹ Ibid.

⁴²⁰ Sagan, Carl *The Demon-Haunted World: Science as a Candle in the Dark*. London: Random House, 2011.

⁴²¹ Jones, Robert Edmond. *The Dramatic Imagination: Reflections and Speculations on the Art of Theatre*. New York: Routledge, 2004, p. 1.

⁴²² Wolf, Werner, 2004, p.326.

⁴²³ Gombrich, Ernst H. *Art And Illusion*. New Jersey: Princeton UP, 1960.

⁴²⁴ Wolf, Werner 2014.

⁴²⁵ Ibid.

⁴²⁶ Grau, Oliver *Virtual Art: From Illusion To Immersion*. London: The MIT Press, 2003, p. 17.

⁴²⁷ Wolf, Werner, 2004, p. 328.

⁴²⁸ Wolf, Werner, 2014.

suspension of disbelief⁴²⁹, a 'reception contract'⁴³⁰, a 'prospective orientation'⁴³¹ or, simply, 'pretence'⁴³². Such an 'orientation' is judged as a vital demarcation, in the human mind, between real and fictional, fantasy and reality; it ensures that audiences will never 'give way... to the[ir] fantasies'⁴³³, and instead use the received artwork as a source of entertainment or instruction, rather than a 'real' scenario to be dealt with using all their embodied faculties. A work's artifice is also the means by which it is effectively judged; that is, our knowledge of its artifice signals the criteria by which it can be evaluated as a *made thing*, rather than an experience that has arisen naturally.

Traditionally, artists attempting to develop works that engage with, and provoke, such 'aesthetic illusions'⁴³⁴ have needed to develop work according to their basic precepts. Their role is to use the processes, forms and techniques of artifice – of aestheticisation – to set and curate the 'reception contract'⁴³⁵ which balances imaginative 'immersion' and 'healthy', 'metareferential'⁴³⁶ detachment. They must 'defamiliarise' and 'make strange'⁴³⁷ the represented world by relying on conventions of artifice, courting their audience's 'culturally acquired awareness of the difference between representation and reality'⁴³⁸. They must construct a bounded, and contingent, form of personhood, drawing on those formal structures in which audiences are literate; preserving the 'real/fictional

⁴²⁹ Coleridge, Samuel Taylor, Leask, Nigel (eds.) *Biographia Literaria*. London: J.M. Dent, 1997.

⁴³⁰ Wolf, Werner, 2014.

⁴³¹ Wolf, Werner, 2014.

⁴³² 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.

⁴³³ Childs, Peter and Fowler, Roger, *The Routledge Dictionary of Literary Terms*. New York: Routledge, 2006.

⁴³⁴ Wolf, Werner 2014.

⁴³⁵ Ibid.

⁴³⁶ Wolf, Werner *et al.* 2009.

⁴³⁷ Shklovskij, Viktor 'Art as Technique'. In: Rivkin, Julie and Michael, Ryan (eds.) *Literary Theory: An Anthology*. Malden: Blackwell Publishing, 1998.

⁴³⁸ Wolf, Werner, 2014.

dichotomy'⁴³⁹ by using an audience's personal 'story schemata'⁴⁴⁰ and 'media knowledges'⁴⁴¹ to orient and drive their experience.

According to such discourses, the *other*, everyday forms of imagined personhood are received, processed and enacted in the human imagination quite differently; the dreamt lives of strangers, our mental configurations of spouses, parents and friends, the inhabitants of our dreams and spiritual experiences, imaginary friends, our 'counterfactual' or subjunctive selves, the mediations of living celebrities and dead notables: in short, the 'often encountered yet little acknowledged'⁴⁴² 'fictional entities' or 'ficta' of our waking and sleeping lives⁴⁴³. Such characters, and our relationships with them, certainly serve as inspiration for the *content* of narratives; there are many stories about friends and lovers, about religious belief, and artforms might incorporate rhetorical elements of such experiences in order to advance their fantasy. However, in considering the *mechanics* of our actual relationships with such persons – how they are conceived, developed and enacted - we are invited to consider them as a related-yet-separate breed. They exist in 'impermeable ontological domains'⁴⁴⁴.

* * * * *

In recent years, such orthodoxy has been challenged by a bevy of interdisciplinary research between the sciences and the humanities, seeking to 'reorient readings'⁴⁴⁵ of aesthetic and narrative theory. From cognitive psychology, social psychology and communication theory to

⁴³⁹ 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].

⁴⁴⁰ Rumelhart, David E. 'Notes on a Schema for Stories'. *Representation & Understanding* (1975), pp.211 – 236, p. 211.

⁴⁴¹ Ryan, Marie-Laure, 2014.

⁴⁴² Thomasson, Amie *Fiction and Metaphysics*. Cambridge: CUP, 1999, p. 35. Kroon, Fred *et al.* 2011.

⁴⁴³ Kroon, Fred and Voltolini, Alberto 'Fictional Entities', *The Stanford Encyclopedia of Philosophy*, 2019, [Online]. Available at: <https://plato.stanford.edu/entries/fictional-entities/> [Accessed: 12th December 2018].

⁴⁴⁴ Moran, Richard, 1994.

⁴⁴⁵ 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.

neuroscience, anthropology, narratology, evolutionary science and cognition studies, this research is continuing to demonstrate how traditional divisions between the functionalities of the imagination are overly simplistic.

As elsewhere in this thesis, this section can only be a summary of developments in this vast field. However, in general researchers and practitioners are reassessing the 'ancient embodied systems'⁴⁴⁶ of the human imagination, no matter their latter-day application, as arising from an embodied evolutionary adaptation to 'a hostile world'⁴⁴⁷; an unpredictable and complex environment that was navigated by waypoints of social success and ostracisation, physical danger, nutritional resources and reproductive opportunities. In such a world, the human brain adapted to pay attention to, mentally process and implement strategies towards these patterns of 'supernormal stimuli'⁴⁴⁸; leading to a combination of 'umwelt' (outer) and 'innenwelt' (inner) environments⁴⁴⁹ that arise from an interpenetration of the surrounding environment, the body and the 'mind incarnate'⁴⁵⁰.

While the specifics of this process of 'mutual interaction'⁴⁵¹, and the importance of each component, remain a subject of debate, there is much consensus on how the body and its sensory faculties respond to exterior stimuli both through 'mindless' or subdoxastic reactions and imaginative mind 'process[es]'⁴⁵². These processes actively assimilate, interpret and organise information, both from without and within, into

⁴⁴⁶ 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].

⁴⁴⁷ Asma, Stephen T, 2017.

⁴⁴⁸ Dennett, Daniel C., 2007, p. 122.

⁴⁴⁹ Sharov, Alexei A. 'Functional Information: Towards Synthesis of Biosemiotics and Cybernetics'. *Entropy* 12 (5), 2010, pp.1050 – 1070, p. 1050.

⁴⁵⁰ Shapiro, Lawrence *The Mind Incarnate*. Massachusetts: The MIT Press, 2004.

⁴⁵¹ Cowart, Monica Wilson, Rlia, Lucia 'Embodied Cognition', *Stanford Encyclopedia of Philosophy*, 2015 [Online]. Available at: <https://plato.stanford.edu/archives/spr2017/entries/embodied-cognition/> [Accessed: 12th December 2019].

⁴⁵² Dix, Alan *et al. Human-Computer Interaction*. Essex: Pearson, 2004, p. 533..

systems of rules, patterns; 'mental models'⁴⁵³ 'scope syntaxes'⁴⁵⁴, 'scripts'⁴⁵⁵ and 'schemas'⁴⁵⁶; flexible structures which can be tested in 'mental simulation'⁴⁵⁷ and adapted as necessary. With such an embodied, situated system, the human animal has evolved to detect, and 'resonate with', relational 'patterns of information'⁴⁵⁸, forge 'mental maps of time and space'⁴⁵⁹ and create 'a coherent understanding of disparate actions and events' which explain the past, process the present and forearm for the future⁴⁶⁰.

Such an interdisciplinary baseplate of perception and imagination is, for many scholars, the 'human universal'⁴⁶¹ origins of what today we consider as narrative. Some scholars criticise this position as an unconsidered 'pannarrativism'⁴⁶², but the popularity of the discourse, and the appearance of evidence supporting it, shows no signs of abating. In the process of cognitive abduction, the seeking of 'eventfulness'⁴⁶³ and 'causality'⁴⁶⁴ and the drawing of illustrative concatenations of events and stimuli from the real world, we participate in something which is 'constitutive of prototypical human experience'⁴⁶⁵;

⁴⁵³ Johnson-Laird, P.N. *Mental Models: Towards a Cognitive Science of Language, Inference and Consciousness*. Massachusetts: Harvard UP, 1983.

⁴⁵⁴ 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.

⁴⁵⁵ Schank, Roger and Abelson, Robert *Scripts, Plans, Goals and Understanding: An Inquiry into Human Knowledge Structures*. New Jersey, LEA, 1977.

⁴⁵⁶ Bartlett, F.C. *Remembering*. Cambridge: Cambridge University Press, 1932.

⁴⁵⁷ Oatley, Keith 'The mind's flight simulator'. *The Psychologist* 21 (12), 2008, pp. 1030 – 1032, pp.1031.

⁴⁵⁸ Ryan, Marie-Laure, 2007, p. 27.

⁴⁵⁹ Byrne, Ruth and Giroto, Vittorio 'Cognitive Processes in Counterfactual Thinking'. In: Markman, KD *et al. (eds.) Handbook of Imagination and Mental Simulation*. London: Routledge, 2008.

⁴⁶⁰ Labov, W. 'Some further steps in narrative analysis'. *Journal of Narrative and Life History* 7 (1-4), 1997, pp. 395 – 415.

⁴⁶¹ White, Hayden 'The Value Of Narrativity in the Representation of Reality'. *Critical Inquiry* Autumn 1980, pp. 5 – 28, p.6.

⁴⁶² Eskenlinen, Markku *Markku Eskenlinen's Response*, 2004 [Online]. Available at: <http://electronicbookreview.com/essay/markku-eskenlinens-response/> [Accessed 8th August 2018].

⁴⁶³ Schmid, Wolf 'Eventfulness, Subject-dependency and Context'. *Foreign Language and Literature* 2 (1), 2010.

⁴⁶⁴ Dannenberg, Hilary *Coincidence and Counterfactuality: Plotting Time and Space in Narrative Fiction*. Nebraska: U of Nebraska P, 2008, p. 113.

⁴⁶⁵ Fludernick, Monika *Towards a 'Natural' Narratology*. London: Routledge, 1996, p. 12.

'a construct of our minds' without 'specific form'⁴⁶⁶, predating the narrative arts in which it was originally identified.

There are many suggestions as to how our internalised, 'self-narratives'⁴⁶⁷, what Tanya Luhrmann calls 'living systems', became publicised in external, social 'communicating systems'⁴⁶⁸, and thus into aestheticised narrative practice: the roles of evolution versus enculturation, of language, and of religious belief (see Chapter 3), sequentially or 'in symbiotic relation with each other'⁴⁶⁹ remain the key determinants. On one hand, the use of 'flexible cognitive frames'⁴⁷⁰ in our everyday lives to comprehend our partial perceptions of 'sequences of events involving thinking individuals, linked by causal relations, motivated by a conflict, and aiming at its resolution'⁴⁷¹ within our rules-defined, systemic perception of the world; and on the other, our use of those frames to engage with the 'fragmentary'⁴⁷² 'storyworlds'⁴⁷³, 'cosmos'⁴⁷⁴, 'wahrnehmung'⁴⁷⁵ or 'sujet'⁴⁷⁶ of narrative artworks, operating according to their own, sometimes 'unnatural'⁴⁷⁷ yet 'logical[ly] complete'⁴⁷⁸ rulesets. Both are acts of 'narrative comprehension'⁴⁷⁹ of 'the dimensions of mentally configured worlds'⁴⁸⁰, and those who inhabit them.

⁴⁶⁶ Sternberg, Meir 'Reconceptualising narratology. Arguments for a Functionalist and Constructivist Approach to Narrative'. *Enthymema* 4 (1), 2001, pp. 34 – 50, p. 48.

⁴⁶⁷ 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.

⁴⁶⁸ Mellmann, Katja, 2012, p.69

⁴⁶⁹ Ryan, Marie-Laure, 2014.

⁴⁷⁰ Herman, David *Story/Logic: Problems and Possibilities of Narrative*. Nebraska: University of Nebraska Press, 2002, p. 49.

⁴⁷¹ Ryan, Marie-Laure, 2009, p.43.

⁴⁷² Sklar, Howard, 2009.

⁴⁷³ Ryan, Marie-Laure, 2013.

⁴⁷⁴ Nash, Christopher *World-Games: The Tradition of Anti-Realist Revolt*. London and New York: Methuen, 1987, p.8.

⁴⁷⁵ Iser, Wolfgang, 1972.

⁴⁷⁶ Wood, Hannah 'Dynamic Syuzhets: Writing and Design Methods for Playable Stories'. In: Nunes, Nuno *Interactive Storytelling*. London: Springer, 2014.

⁴⁷⁷ Alber, Jan *Unnatural Narrative: Impossible Worlds in Fiction and Drama*. Nebraska: University of Nebraska Press, 2016.

⁴⁷⁸ Oatley, Keith 'Emotional Intelligence and the Intelligence of Emotions'. *Psychological Enquiry* 15 (3), 2004, pp.216 – 222, p. 216.

⁴⁷⁹ 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.

⁴⁸⁰ Herman, David, 2013.

Within the above-described model of the evolved human imagination, it is understandable that our attention, and our imaginative faculties in almost any situation, tend to prioritise the presence of *other* humans, other social beings, like ourselves; indeed, our survival often depends upon the correct mental simulation of the intentions and actions of others through a 'sophisticated process of interpretation with narrative at its core'⁴⁸¹. Our ability to 'mentalise'⁴⁸², empathise⁴⁸³ and 'impute... what is going on in another person's mind'⁴⁸⁴ from partial and indirect social cues is another adaptive tool which does not restrict itself to categorisation of 'person/not person' in the outside world⁴⁸⁵. This is the scientific grounding of the 'character-focussed' approach to narrative delineated in this thesis' introduction⁴⁸⁶. Our imaginative engagement with the inhabitants of fictional narrative worlds – with characters – represents the satisfaction of a 'core appetitive circuit'⁴⁸⁷ which seeks to understand the 'motives, intentions, beliefs and.. resulting behaviour'⁴⁸⁸ of others 'whose inner lives are rarely easily discerned but warrant exploration'⁴⁸⁹.

Much research, in this field in particular, points to an intriguing complication of the supposed *typal* difference between our perception of real and fictional social others. This includes research on how fictional people can facilitate personal growth⁴⁹⁰, or encourage negative social

⁴⁸¹ 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.

⁴⁸² Waytz, Adam *et al.* 'Response of Dorsomedial Prefrontal Cortex Predicts Altruistic Behavior'. *The Journal Of Neuroscience* 32 (22), 2012, pp.7646 – 7650, p. 7646.

⁴⁸³ 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.

⁴⁸⁴ Goldman, Alvin *Simulating Minds: The Philosophy, Psychology and Neuroscience of Mindreading*. Oxford: Oxford University Press, 2006.

⁴⁸⁵ Farah, Martha J and Heberlein, Andrea S. 'Personhood and neuroscience: naturalizing or nihilating?' *Am J Bioeth* 7 (1), 2007, pp. 37 – 48.

⁴⁸⁶ Sklar, Howard, 2009.

⁴⁸⁷ Costa, Vincent D. *et al.* 'Emotional imagery: Assessing pleasure and arousal in the brain's reward circuitry'. *Human Brain Mapping* 31 (9), 2010, pp. 1446 – 1457, p. 1446.

⁴⁸⁸ Palmer, Alan 2010

⁴⁸⁹ Kidd, David Comer and Castano, Emanuele 'Reading Literary Fiction Improves Theory Of Mind'. *Science* 342 (6156), 2013, pp.377 – 380, p. 377.

⁴⁹⁰ 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

behaviours⁴⁹¹; studies on 'parasocial', 'psychologically real and meaningful' relationships with otherwise 'unreal' people⁴⁹²; and ongoing debates on the 'puzzle of fictional emotions'⁴⁹³, a key 'paradox of fiction'⁴⁹⁴ which seeks to reconcile the apparent reality of the emotions that audiences feel towards fictional characters with their supposedly-conscious understanding of their artifice. For some scholars, the emotions are only 'pretend'⁴⁹⁵; for many others, our engagement with imagined characters can sidestep the 'prospective orientation'⁴⁹⁶ entirely.

Approaching this argument from the other side, there is much research into how our supposedly undistanced, 'hallucinatory' engagements with persons in our lives *outside* of art – both real and unreal - may be more artificial and 'subjunctive' than previously admitted. In studies on counterfactuality⁴⁹⁷, social frames⁴⁹⁸, 'cognitive metarepresentation'⁴⁹⁹, imaginary friends⁵⁰⁰, our relationships with celebrities and media figures⁵⁰¹, the history of economic and political centres in early human development⁵⁰² - indeed, in the very practice of history itself⁵⁰³ - we often see our engagement with narrative scenarios outside the purely aesthetic as nonetheless 'distanced', in some way; engaging with the real world from a self-consciously subjunctive perspective, while still respecting its very real effect on our lives. Such distancing from the real world, while simultaneously participating

⁴⁹¹ Tsay, Mina and Krakowiak, Maja 'The impact of perceived character similarity and identification on moral disengagement'. *IJART* 4, 2011, pp.102 – 110.

⁴⁹² Mar, Raymond A *et al.*, 2011.

⁴⁹³ Tavinor, Grant, 2007.

⁴⁹⁴ Radford, Colin 'How Can We Be Moved by the Fate of Anna Karenina?' *Proceedings of the Aristotelian Society* 49, 1975, pp. 67-80.

⁴⁹⁵ Walton, Kendall 'Spelunking, Simulation and Slime: On Being Moved by Fiction'. In: Hjort, Metta (eds.) *Emotion and the Arts*. Oxford: Oxford University Press, 1997.

⁴⁹⁶ Wolf, Werner, 2014.

⁴⁹⁷ Byrne, Ruth 'Precis of The Rational Imagination: How People Create Alternatives to Reality'. *Behavioral and Brain Sciences* 30 (1), 2007, pp. 439 – 480.

⁴⁹⁸ Goffman, Erving *Frame analysis: An essay on the organisation of experience*. Massachusetts: HUP, 1974.

⁴⁹⁹ Mellmann, Katja, 2013, p. 74.

⁵⁰⁰ 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.

⁵⁰¹ Stever, Gayle 'Parasocial and Social Interaction with Celebrities: Classification of Media Fans'. *Journal of Media Psychology* 14 (3), 2009.

⁵⁰² Harari, Noah Yuval. *Sapiens*. London: Harvill Secker, 2014.

⁵⁰³ Cohn, Dorritt, 1989.

within its realities, may be key to our healthy psychosocial development. It may be constitutive of our humanity.

* * * * *

No study of this trend, representing as it does a structural shift across many disciplines, could ever be exhaustive. However, the evidence above demonstrates that, from discipline to discipline, the formal divide between imaginative engagement with both fiction and reality is being further complicated, or even systemically weakened. Evidence mounts that everyday illusions can be 'basically pleasurable', or 'distanced', 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 disinterestedness'⁵⁰⁴. The complexity and interpenetration of these states, and the 'oscillation'⁵⁰⁵ across the 'borderline area' between them⁵⁰⁶, relies on a modern understanding of human embodied mentality, one arising out of a common 'interpretative compulsion'⁵⁰⁷ that excites the 'intrinsically semantic dimension'⁵⁰⁸ of our cognitive, emotive and embodied experience, and manifests most commonly in the perceptive and cognitive frame of 'narrative'⁵⁰⁹; a form which, 'in transaction with realities'⁵¹⁰, is not a "specialized, ad hoc response... to narrative texts'⁵¹¹ but broadly representative across human existence.

⁵⁰⁴ Berleant, Arnold and Hepburn, Ronald 'An Exchange on Disinterestedness', *Contemporary Aesthetics* [Online]. Berleant Available at: <http://aesthetics.org/newvolume/pages/article.php?articleID=209>

⁵⁰⁵ Westphal Tally Jr., Robert *Topophrenia: Place, Narrative and the Spatial Imagination*. Indianapolis: IUP, 2019, p. 41.

⁵⁰⁶ Hofstadter, Douglas, 2000, p. 362

⁵⁰⁷ Mellmann, Katja, 2013, p. 75.

⁵⁰⁸ Monahan, Seth *Mahler's Sonata Narratives*. [PhD Dissertation]. Connecticut: Yale University, 2008.

⁵⁰⁹ Scheibe, Karl E. and Barrett, Frank *The Storied Nature of Human Life: The Life and Work of Theodore R. Sarbin*. London: Palgrave Macmillan, 2017.

⁵¹⁰ 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.

⁵¹¹ Caracciolo, Marco, 2013.

The 'autocosmic' philosophy is not designed to encompass this theoretical and practical drift, in often-disparate areas of academic and artistic thought, but rather to be one specific emergence of its ramifications. It uses the evidence presented above of the 'contaminations between [the] fictional and factual'⁵¹² to set a baseline for dismantling the 'unreal discontinuity'⁵¹³ between artistic practice and the constructive narrative acts of real life. It relies on an interdisciplinary conception of the imagination as the main driver of the 'resonance' of both artistic and non-artistic experiences; and thus, in the face of artistic challenges, counsels that artists reach *beyond* the artifices of their own form – indeed, beyond aesthetics entirely - to find new models of constructing narrative experience, where other, more instructive 'resonances' might await.

* * * * *

As mentioned in the previous section, not every scholar agrees that 'everyday aesthetics', and 'pannarrativist' readings of non-aesthetic human experiences, are commensurate with 'aesthetic' narrative practice. Marie-Laure Ryan, whose work on 'transmedia narratology'⁵¹⁴ has been instrumental in the construction of the 'autocosmic' philosophy, is sceptical about the 'narrative turn's' influence, and questions the utility of a model of narrative that includes such 'abstractions' as human thought, mental 'experience', 'explanation', and 'representation'⁵¹⁵. Such a model, she fears, creates a 'free-floating'⁵¹⁶ use of the term which cannot be productively applied to theoretical work. Instead, she proposes the related term 'narrativity', to describe a 'scalar

⁵¹² Schabert, Ina 'Fictional Biography, Factual Biography, and their Contaminations'. *Biography* 5 (1), 1982, pp.1 – 16, p.1.

⁵¹³ Moran, Richard, 1994.

⁵¹⁴ Ryan, Marie-Laure 'Transmedia Narratology and Transmedia Storytelling' *Artnodes* 18, 2016 [Online]. Available at: <https://artnodes.uoc.edu/articles/abstract/10.7238/a.voi18.3049/> [Accessed 8th August 2018].

⁵¹⁵ Ryan, Marie-Laure 'Towards a definition of narrative'. In: Herman, David (eds.) *The Cambridge Companion To Narrative*. Cambridge: Cambridge University Press, 2007.

⁵¹⁶ Ryan, Marie-Laure, 2017, p. 528.

property' of any 'semiotic object' – not just 'strict narratives'⁵¹⁷ – which stands to measure the degree of mental narrative excitability that a particular experience or artefact entails. It is in this quality of narrativity, rather than narrative explicitly, that 'experientiality'⁵¹⁸ – the root of autocosmics, and a large part of any definition of 'resonance' – can be found.

My own autocosmic philosophy differs from Ryan's position primarily in the fact that its focus is not theoretical, but methodological. The risk of scholarly over-extension of the term 'narrative' is something which I recognise; and in the theoretical workings of narratology, it certainly appears that 'pannarrativism' does often stretch the definition of the term rather thin. For a *practical* 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'⁵¹⁹. Whether an experience, text, object or mental phenomenon is truly 'narrative' or merely has 'narrativity' does not prejudice its utility to my 'design activity... [which aims] at building a... software product... that satisf[ies] the author and then, consequently, the end-user'⁵²⁰. An 'unaesthetic' experience that has 'narrativity' can still serve as a useful model of 'narrative' engagement to an aesthetic work; and, by Ryan's own definition of a narrative as that which is deliberately designed to induce narrative comprehension⁵²¹, such an experience would become narrative in being implemented aesthetically, through my own authoring, regardless.

⁵¹⁷ Ibid.

⁵¹⁸ Ryan, Marie-Laure, 2017.

⁵¹⁹ Brooks, Peter *Reading for the Plot: Design and Intention in Narrative* Massachusetts: Harvard University Press, 1984, p. ix.

⁵²⁰ Spierling, Ulrike 'Interaction Design Principles as Narrative Techniques for Interactive Digital Storytelling'. In: Koenitz, Hartmut *et al.* (eds.), 2015, pp. 159 – 173, p. 170.

⁵²¹ 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.

Ryan's approach has other differences from my own; focussing more on mediated, 'textual manifestations'⁵²², 'tellability'⁵²³, and the importance of more traditional stances on the concepts of 'aesthetic', 'distance', 'belief'⁵²⁴ and other factors which the autocosmic rejects. Particularly, the tenets of detachment, 'aesthetic distance', the 'magic circle' and 'double-consciousness' explored in the first sections of this chapter are still strongly ensconced in many narratological theses in game studies and transmedial narratologies, including Ryan's own⁵²⁵. 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'⁵²⁶, such exploration allows for practical exercises in expanding the modalities of narrative art.

In some of Ryan's more recent writing⁵²⁷⁵²⁸, I have detected a slight fuzzying of her stance: a consideration of whether the strict definition of narrative, 'an analytical concept designed by narratologists', is important for 'most people [to] recognize'⁵²⁹. 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 on an ambivalent note; unsure as to whether such a broad definition of narrative to include many everyday imaginings is liberating or obfuscating⁵³⁰. It is in this fuzziness that I site my own autocosmic theory. Autocosmics is unconcerned with the 'technical dimensions'⁵³¹ of any Grand Theory of narrative versus narrativity: but is instead

⁵²² 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.

⁵²³ Ryan, Marie-Laure 'Embedded Narratives and Tellability'. *Style* 20 (3), 1986, pp. 319 – 340.

⁵²⁴ Ryan, Marie-Laure, 2001.

⁵²⁵ Khandaker-Kokoris, Mitu, 2015.

⁵²⁶ Calleja, Gordon 'Narrative Involvement in Digital Games'. *Conference proceedings from Foundations of Digital Games. Chania, Crete, Greece*. FDG, 2013, p.2 .

⁵²⁷ Ryan, Marie-Laure, 2017.

⁵²⁸ 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.

⁵²⁹ Ryan, Marie-Laure, 2017, p. 518.

⁵³⁰ *Ibid.* p. 531.

⁵³¹ Ryan, Marie-Laure, 2017, p.528.

concerned with interdisciplinary study into the nature of human response to a wide variety of 'resonant' aesthetic and non-aesthetic stimuli – the 'untold stories' and 'purely mental images' that characterise the response of 'most people'⁵³² – and how those responses and stimuli might be applied constructively to the work of artists trying to deliberately excite that response in some manner.

* * * * *

At face value, my definition of the 'autocosmic' seems very similar to other design philosophies that have arisen from the discourses explored in this chapter, and risks 'dilut[ing] terminological precision' through the invention of another term⁵³³. Across artistic practice over the last sixty years there has been a 'continuing uncertainty' about whether existing definitions of the 'aesthetic'⁵³⁴ are a restrictive social convention⁵³⁵; and a corresponding interest in redefining the relationship between artistic artefacts and real life. There has thus been a concomitant 'broadening of the aesthetic tradition'⁵³⁶ to reconsider that relationship fundamentally, and to place more emphasis on the 'evanescent relationship... between subject and object', the 'structuring of experiences'⁵³⁷, and the 'process of communication', rather than the form or artistic provenance of the object itself⁵³⁸. Such a trend is visible in scholarly investigations into the 'aesthetics of everyday life'⁵³⁹, and the 'postmodern thrust' of Allan Krapow⁵⁴⁰, Joseph Beuys⁵⁴¹, Henry Flynt, the Fluxus collective and other 'concept' artists and performance

⁵³² Ryan, Marie-Laure, 2017, p. 518.

⁵³³ Calleja, Gordon, 2013.

⁵³⁴ Shelley, James *The Concept of The Aesthetic*, 2017 [Online]. Available at: <https://plato.stanford.edu/entries/aesthetic-concept/#AesObj> [Accessed 8th August 2018].

⁵³⁵ Mellmann, Katja, 2013, p. 74.

⁵³⁶ Slater, Barry *Aesthetics*, 2018 [Online]. Available at: <https://www.iep.utm.edu/aestheti/> [Accessed 8th August 2018].

⁵³⁷ Kirkpatrick, Graeme 'Video Game Image: The aesthetic character of digital gaming'. In:

⁵³⁸ Smith, Jonathan 'Introduction'. In: Light, Andrew and Smith, Jonathan (eds.), 2005, p. x.

⁵³⁹ Light, Andrew and Smith, Jonathan (eds.) *The Aesthetics of Everyday Life*. New York: Columbia University Press, 2005.

⁵⁴⁰ Krapow, Allan and Kelley, Jeff (eds.) *Essays on the Blurring of Art and Life*. Berkeley: UCP, 1993.

⁵⁴¹ Giesen, Bernhard 'Performance Art'. In: Alexander, Jeffrey C. et al. (eds.) *Social Performance: Symbolic Action, Cultural Pragmatics and Ritual*. Cambridge: CUP, 2006, pp. 315 – 324, p. 315.

artists originally emerging in the 1960s. Such artists themselves built on changing interdisciplinary attitudes, and the work of earlier artists and thinkers, to attempt to free art from its aestheticised boundaries by drawing upon, and interpenetrating with, the embodied ‘social reality’⁵⁴² of everyday life. Through the creation of ‘happenings’, ‘lifeworks’⁵⁴³ and other performative and transgressive acts, such artists sought to ‘decontain’ art; to remove it from its ‘esthetic’ shackles⁵⁴⁴ and use the modes of the reception of real life to inform both ‘the perspective of the spectator or the audience’⁵⁴⁵.

The ‘autocosmic’ does indeed draw on the example of these movements, though it differs from them in several ways. Unlike Fluxus and other postmodern movements mentioned above, it is not inherently political or conceptual. An ‘autocosmic’ work does not seek to draw attention to its own artifice, to ‘metaleptically’⁵⁴⁶ comment upon its own form, to provoke real-world action or to symbolise the social context in which it was created. It *can* do these things; indeed, Koenitz does consider Brechtian practice as a model for computational narrative design⁵⁴⁷, and as Chapter 1 of this thesis explored, some of my objectives for *knole* could well be considered ‘metaleptical’.

While works produced autocosmically are interested in the ‘tradition-smashing’⁵⁴⁸ philosophy at the heart of the ‘decontainment’ of art⁵⁴⁹, and how a move away from the ‘residues of a European past’⁵⁵⁰ and a strict formalism might inform narrative practice, its objectives are still most definitely aesthetic and artisanal. An autocosmic narrative is

⁵⁴² Clay, Jean ‘Art Tamed and Wild’. In: Alberro, Alexander and Stimson, Blake (eds.) *Conceptual Art: A Critical Anthology*. Massachusetts: The MIT Press, 2000, pp. 136 – 141, p.140.

⁵⁴³ Krapow, Allan and Kelley, Jeff, 1993, p. xxiv.

⁵⁴⁴ Ibid.

⁵⁴⁵ Giesen, Bernhard, 2006, p. 316.

⁵⁴⁶ Wolf, Werner, 2014.

⁵⁴⁷ Koenitz, Hartmut, 2015, p. 58.

⁵⁴⁸ Giesen, Bernhard, 2006, p. 316.

⁵⁴⁹ Turl, Adam ‘Interrupting Disbelief: Narrative Conceptualism and Anti-Capitalist Studio Art’, *Red Wedge*, 2015 [Online]. Available at: <https://www.redwedge.com/essays/interrupting-disbelief-ilya-kabakov-narrative-conceptualism-and-anti-capitalist-studio-art> [Accessed: 20th December 2019].

⁵⁵⁰ Krapow, Allan and Kelley, Jeff, 1993, p. xxvii. xxvii

still primarily a narrative designed for aesthetic reception, concerned with the imaginative evocation of non-actual worlds and places *for their own sake*, or rather for the formal objectives and stances of the artists and audiences that co-produce them. It seeks to reconsider the ‘conventions of presentation and display of art’, and the role of the audience’s reception, through a ‘disciplined effort to observe, engage and interpret the processes of living’⁵⁵¹, for aesthetic rather than social ends. Whether this is a betrayal of such movements’ philosophies – to study ‘decontainment’ solely to produce better ‘contained’ art - is a matter of personal opinion.

As a philosophy, it is arguably a manifestation, concretisation and extension of all those instances, throughout the history of aesthetic narrative, when artists have sought ‘analogues of art in nonart experience’⁵⁵², either consciously or not; whether in the early development of artforms, when natural faculties became increasingly aestheticised, or in later reconsideration of their tenets. Such instances can be found in the direct excitation of physiological traits for ‘jump scares’ in horror films⁵⁵³, or in the manner that Impressionism and other movements investigate different representations of human visual traits⁵⁵⁴. The pseudepigraphical and epistolary forms which *know* co-opts used the format of everyday narrative forms and receptions to structure artificial narratives to certain ‘resonant’ ends⁵⁵⁵, and find their natural evolution in today’s multiform transmedia works and alternate reality games, which use the structure and experience of navigating modern, functional communication networks as the basis for narrative experiences of a particular ‘resonance’. The ‘autocosmic’ is a way to frame and consider such examples, and to delineate their technics, in

⁵⁵¹ Ibid, p. xii.

⁵⁵² Ibid, p. xvi.

⁵⁵³ 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].

⁵⁵⁴ ‘A study of light; Contrasting Impressionism and Pointillism’, *Google Arts & Culture*, 2021 [Online]. Available at: https://artsandculture.google.com/usergallery/a-study-of-light-contrasting-impressionism-and-pointillism/EQJSx_R-eUu_Kg [Accessed: 20th January 2021].

⁵⁵⁵ Beebee, Thomas O. ‘Introduction: letters, genealogy, power’. In: Beebee, Thomas O. (eds.) *Epistolary Fiction in Europe, 1500 – 1850*. Cambridge: CUP, 1999, pp. 1 – 17, p. 8.

order to follow their implicit model into other, productive realms for one's own practice.

* * * * *

The nominal term 'autocosmic' is one which I feel best encompasses this method. It distinguishes from these other practices above described as its own 'generalizable convention'⁵⁵⁶, and stands as a convenient summary of the practical application of 'broader conception[s] of narrativity'⁵⁵⁷. Other, related terms proved inadequate as I developed this theory over the course of my work. '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 heterogeneous and ill-understood'⁵⁵⁸ to represent something more precise. 'Narrative', in the general sense of 'mental representation'⁵⁵⁹ as some narratologists mean it, is again too controversial in application, and, as this chapter has shown, may contain within it associations which are unhelpful.

The term 'autocosmic' translates as 'self-worlds', and is designed to refer to the undifferentiated range of faculties, forms and apparatus that produce and sustain imaginative engagement with all manner of artefacts and phenomena, and the production of embodied mental 'cosmoses'⁵⁶⁰; both aesthetic and otherwise. 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'⁵⁶¹. It makes no implicit distinction between the types, origins and qualities of the 'cosms' that it refers to, allowing itself to 'comprise

⁵⁵⁶ Koenitz, Hartmut, 2015.

⁵⁵⁷ Herman, David, 2018.

⁵⁵⁸ Moran, Richard, 1994

⁵⁵⁹ Sternberg, Meir 'Universals of Narrative and Their Cognitivist Fortunes'. *Poetics Today* 24 (3), 2003, pp. 517 – 638, p. 555.

⁵⁶⁰ Nash, Christopher, 1987, p.8.

⁵⁶¹ Niederhoff, Burkhard, 'Focalization', *the living handbook of narratology*, 2013 [Online]. Available at: <https://www.lhn.uni-hamburg.de/node/18.html> [Accessed: 20th December 2019].

many more things than we would normally subsume⁵⁶² under the label of 'aesthetic' illusion. I have adapted it from another pleasing term, 'paracosm', used extensively (but not coined⁵⁶³) by the developmental psychologist Marjorie Taylor⁵⁶⁴. In her work, it specifically describes the intricate fictional worlds invented by children, the mentally ill and artists alike. 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.

⁵⁶² Mellmann, Katja 2013, p. 82.

⁵⁶³ Cohen, David and Mackeith, Stephen *The Development of Imagination: The Private Worlds of Childhood*. London: Routledge, 1992.

⁵⁶⁴ 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.

Section 2.3: An Autocosmic Approach To The Challenges Of Computational Character

It is in the 'autocosmic' philosophy for artistic development – the seeking of models for constructing aesthetic narrative experiences *outside* the bounds of aesthetic artifice – that most concerns me in my investigation into the creation of 'resonant' computational character. While I believe it is a stance that could benefit *any* artist, working in any form (see Conclusion), I feel that it has a particular relevance to narrative comp-art.

This is because conventional design philosophies in this form do not only tend towards the established conventions of the form of comp-art itself; indeed, they often pursue the 'emotional residue of previous narrative experiences'⁵⁶⁵ as a template for their own efforts. Often, solutions to the challenges of comp-art (like those laid out in Chapter 1) are 'imported from other media'⁵⁶⁶, constructed and evaluated by the standards, and working practices, of books, films⁵⁶⁷, radio⁵⁶⁸, theatre⁵⁶⁹ and the 'love stories and intimate dramas'⁵⁷⁰ of other, traditional aesthetic sources of 'non-actual' personhood⁵⁷¹.

While it would be wrong to state that such models of characterisation are entirely 'irrelevant'⁵⁷², their influence avoidable, or the efforts of 'artists... working to understand [personhood] for millennia'⁵⁷³ of no use to the comp-artist, there is agreement that the 'particular'⁵⁷⁴ formal qualities of comp-art have been under-considered when such traditional models are applied. As Koenitz asserts, the nature of such models as 'the Aristotelian arc', which is often cited as a major

⁵⁶⁵ Jenkins, Henry, 2006, p. 671.

⁵⁶⁶ Murray, Janet, 1999, p. 58.

⁵⁶⁷ Koster, Raph *et al.*, 2018.

⁵⁶⁸ Pratt, Charles *In: Klepek, Patrick*, 2017.

⁵⁶⁹ Laurel, Brenda, 1993.

⁵⁷⁰ Spector, Warren, 2013.

⁵⁷¹ Lankoski, Petri and Bjork, Staffan, 2007.

⁵⁷² Calleja, Gordon, 2011, p.2.

⁵⁷³ Loyall, A. Bryan, 1997, p.169.

⁵⁷⁴ Keogh, Brendan, 2015.

foundation for comp-art narratives, have been misunderstood entirely⁵⁷⁵.

Chapter 1 of this thesis began with a consideration of the universal similarities between all characters, and the 'particular'⁵⁷⁶ 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'⁵⁷⁷ – her concept of narrative comp-art as an uncomplicated procedural recreation of the existing canon - as a 'myth' and a 'dream'⁵⁷⁸⁵⁷⁹ which has little chance of being realised using computational technologies. Others consider the adoption of 'classical notions of narrative'⁵⁸⁰ in comp-art to be a 'fraught practice'⁵⁸¹, both 'useful and dangerous'⁵⁸². Such 'legacy theoretical frameworks'⁵⁸³ were not designed to respond to the 'alternative aesthetic principles'⁵⁸⁴ – the different resonances and 'systemic model[s]'⁵⁸⁵ – that 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 models⁵⁸⁶; 'map[ping] traditional narrative structures'⁵⁸⁷ to decidedly different procedural structures in comp-art.

⁵⁷⁵ Koenitz, Hartmut *et al.*, 2018.

⁵⁷⁶ Keogh, Brendan, 2015.

⁵⁷⁷ Murray, Janet, 1997.

⁵⁷⁸ Bogost, Ian, 2017.

⁵⁷⁹ Ryan, Marie-Laure, 2001.

⁵⁸⁰ Calleja, Gordon 'Experiential Narrative In Game Environments'. *Proceedings of the DiGRA 2009 Conference*. DiGRA, 2009, p. 1.

⁵⁸¹ Ciccoricco, David 'Games as Art/Literature'. In: Ryan, Marie-Laure *et al.* (eds.), 2014, pp. 220-224, p. 223.

⁵⁸² Wright, Will 'Introduction' In: Freeman, David *Creating Emotion In Games*. Berkeley: New Riders, 2004.

⁵⁸³ Koenitz, Hartmut *et al.*, 2015, p. 96.

⁵⁸⁴ Jenkins, Henry, 2006, p. 671.

⁵⁸⁵ 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].

⁵⁸⁶ Koenitz, Harmut, 2015, p. 3.

⁵⁸⁷ Jenkins, Henry, 2006, p. 671.

In counselling a move away from traditional narrative models, I do not capitulate to a strictly Formalist, or ludological position⁵⁸⁸ that debates the importance of narrativity and 'worldness'⁵⁸⁹ to videogames and other comp-art entirely; 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', or 'functional ludo-narrativism'⁵⁹⁰ that privileges the 'complex interplay between these two modes of representation'⁵⁹¹. In this spirit, new models must be sought which provide 'more suitable... narrative modes and themes'⁵⁹²; narrative forms that may well be found outside of *any* self-consciously aesthetic practice, in the 'everyday aesthetics'⁵⁹³ of our embodied imagination.

Scholars and practitioners have written extensively on the need for comp-art's narrative models that cleave 'closer to life experience'⁵⁹⁴ and 'the individual's phenomenal relation to the world'⁵⁹⁵, as an 'experience... distinct from artefact or object'⁵⁹⁶. They have recognised that the computational's ability to represent functionality through 'procedural combinatorics'⁵⁹⁷ has more in common with our 'experiential'⁵⁹⁸, systemic, social, interactive, 'sensorimotor'⁵⁹⁹ engagement with worlds directly than other modes of mimesis. There is promising work on the creation of new approaches which explore in detail the variety of narrative experiences that are created when the 'system-modeling medium'⁶⁰⁰ of the embodied human mind works in

⁵⁸⁸ Koenitz, Hartmut *et al.* 'Introduction: The Evolution of Interactive Digital Narrative Theory'. In: Koenitz, Hartmut *et al.* (eds.), 2015, pp. 67 – 76.

⁵⁸⁹ Ryan, Marie-Laure 'On The Worldness Of Narrative Representation' *Expanding Universes: Exploring Transmedial and Tranfictional Ways of World-building International Conference*. Krakow, 2016.

⁵⁹⁰ Ryan, Marie-Laure *Avatars Of Story*. Minneapolis: UMP, 2006, p. 203. *Avatars of sto*

⁵⁹¹ Koenitz, Hartmut, 2015, p. 56.

⁵⁹² Ryan, Marie-Laure, 2001.

⁵⁹³ Light, Andrew and Smith, Jonathan, 2005.

⁵⁹⁴ Ryan, Marie-Laure, 2014, p. 11.

⁵⁹⁵ Vella, Daniel, 2015.

⁵⁹⁶ Candy, Linda and Ferguson, Sam (eds.) 2014, p. 2.

⁵⁹⁷ Koenitz, Hartmut, 2015, p. 53.

⁵⁹⁸ Calleja, Gordon, 2011, p. 119.

⁵⁹⁹ Penny, Simon *What Is Artful Cognition?*, 2003 [Online]. Available at: <https://pdfs.semanticscholar.org/2bc3/85604c2870c61c861966093cd4fdb615fbo.pdf> [Accessed 8th August 2018], p. 5.

⁶⁰⁰ Murray, Janet, 1997, p.111.

concert with the material systems of the world. These range from the reconsideration of the ‘story arc’ as a model for narrative progress in comp-art⁶⁰¹, to the study of non-Western narrative structures and characterisations⁶⁰². The ‘autocosmic’ is a way to frame the spirit that lies behind such work: a conceptual and practical framework for seeking a wider set of exemplars of *process*, beyond the traditionally ‘aesthetic’, in order to inspire new methods of ‘resonant’ narrative construction within comp-art. My work on Project `knole` is a specific implementation of this general design philosophy.

An autocosmic approach to creating ‘resonant’ computational characters, then, requires methodological access to the full spectrum of human experience of ‘narrative’ (or, in Ryan’s rubric, ‘narrativist’⁶⁰³) forms, including, in the words of Allan Krapow, ‘whatever has not yet been accepted as art, but has caught an artist’s attention with that possibility in mind’⁶⁰⁴. Such forms must be interrogated to understand how they ‘resonate’, according to the universal principles of narrative response. They must, finally, stand as object lessons for overcoming the challenges, and harnessing the opportunities, of computational narratives. Specifically in the case of this thesis, this means representing personhood in a way that is both meaningfully computational and ‘resonant’.

For some, this challenge is a lost cause: 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 at all. 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

⁶⁰¹ Koenitz, Hartmut ‘The ‘Story Arc’ – a Ghost of Narrative Game Design’. Melbourne: DiGRA Conference, 2017.

⁶⁰² Koenitz, Hartmut, 2017.

⁶⁰³ Ibid. p. 525.

⁶⁰⁴ Krapow, Allan and Kelley, Jeff (eds.) *Essays on the Blurring of Art and Life*. Berkeley: UCP, 1993.

light, and in a context that's bigger than [our] individual actions'⁶⁰⁵. This is what Bogost means by his term 'procedural rhetoric' - the heart of comp-art's ability to resonate – and it is, in his view, decoupled from the 'person-first' frameworks of traditional narrative. Fundamentally, I agree with Bogost upon the idea of the dynamic model, or the simulatory system, as a 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 this regard; and as Chapter 1 demonstrated, attempts to directly and meaningfully represent persons-as-systems (particularly by directly prototyping psychological models) 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 philosophy, 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]

⁶⁰⁵ Bogost, Ian, 2017.

cybernetic nature⁶⁰⁶, it seeks neither technical excellence, nor adherence to strict formal precepts: rather, it requires a reconsideration of what character – of what a person – can be.

⁶⁰⁶ Calleja, Gordon 2011, p. 135.

"This Foetid And Un-kept Place"

Applying The Autocosmic Method To Computational Character

Section 3.1: The Autocosmic In kno1e

The 'autocosmic' gives artists a set of guidelines by which to seek out a wider gamut of exemplars, from across human experience, deliberately distant from the precepts of their own aestheticised discipline. This promiscuity is not advisable merely in terms of subject matter, theme or material aesthetic: backed by interdisciplinary research, the autocosmic considers the manners in which other human experiences are received – the way they are made, refined and understood – as equally instructive to constructing 'resonant' artworks.

For my own project, this procedure was primarily concerned with the construction and reception of 'persons', and so I have sought other discourses – beyond the fictive and the aesthetic – where the human imagination resonantly engages with 'persons', either real or imaginary; particularly when that engagement is systemic in some manner.

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 subjects as disparate as human-animal relationships, ethology, euthanasia studies, toy studies (particularly electronic toys and other 'relational artefacts'⁶⁰⁷), human-robot interaction across many domains and use cases, chatbots, imaginary friends, videogame 'bots', automata and early animatronics, dehumanisation studies, mechanomorphism and compassion fatigue,

⁶⁰⁷ Turkle, Sherry, 2005.

amongst many others. All of these discourses provided alternative, sometimes-surprising insights into the way human beings engage with other people, imaginary beings, constructed entities and personified experiences; often stretching the definition of what might be considered 'interpersonal interaction'.

However, my most productive line of enquiry, which has most indelibly coloured development and construction of Project *knole* as a work of resonant computational characterisation, is that of the imaginative relationship between human beings and *environments*. 'Environment', here, is 'broadly conceived'⁶⁰⁸, subsuming a wide range of concepts, from the most general ideas of 'space' to more specific definitions of 'place', 'worlds'⁶⁰⁹, 'locales' and 'surroundings'. It includes aesthetic environments, 'landscapes', as well as more systemic, relational conceptions, from definitions of 'ecosystem' to the object-oriented narrative landscapes of the Russian school⁶¹⁰.

A study of the human relationship with space and place can seem an odd template for designing interrelationships between persons. The almost-inviolable distinction between places and beings – agents and environments, characters and settings – has historically transcended any one discipline. Despite their importance as 'one of the most powerful affective devices' in our species' history⁶¹¹, the spaces in which our narratives – of any sort – take place have often been categorically distinguishable from, and subservient to, the beings that inhabit and enact within them. My autocosmic research, however, has revealed an interdisciplinary and cross-generational tangle of ideas and theses, from the arts and the sciences, which circumscribe a new, more complex

⁶⁰⁸ 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.

⁶⁰⁹ Ryan, Marie Laure, 2001, p.91.

⁶¹⁰ Chatman, Seymour *Story And Discourse: Narrative Structure in Fiction and Film*. London: Cornell University Press, 1980, p. 139.

⁶¹¹ Martin, Gareth Damian, 2016.

ontology full of surprising fusions. This 'spatial' or 'spatiotemporal turn'⁶¹² enlarges environments, spaces and places beyond the role of 'empty container'⁶¹³ into livelier, more troublesome objects of study. In such a light, comparing persons and environments (whether real or imagined) does not seem so strange. Both appear rich in systemic complexity, resonant 'embodied, emotional... engagements'⁶¹⁴, intersubjective agency, individuality and relationality. The evidence for such connections stretches back to the very foundations of our species, and forward to the present day. My character Anne Latch, and the historical period of which she is a part, occupies a curious fulcrum in this timeline: one of several points throughout human history (certainly Western history) where the idea of place-as-person – as a form of *systemic personhood* – was being renegotiated.

⁶¹² Jameson, Fredric *Postmodernism, or the Cultural Logic of Late Capitalism*. USA: Duke University Press, 1991, p. 154.

⁶¹³ Rao, Eleanora 'Mapping The Imagination: Literary Geography'. *Literary Geographies* 3 (2), 2017, pp. 115-124, p. 119.

⁶¹⁴ *Ibid.* pg. 425.

Section 3.2: The Enlightenment, And A History Of ‘Place-As-Person’

It is no accident that I chose the tumultuous years of 1759 and 1760 as the focal point for Project knole’s narrative; a period of two years in which Anne Latch transforms from millworker to influential parvenus. In the development of knole’s artistic components (see Chapter 3.5 and 3.6) this time period became a natural choice, given the interests of the project as a whole. Even Anne, in her rural backwater and doubly excluded from the historic record by her class and her gender, is aware that she lives in ‘Turning’ times, the start of a ‘Newly Age’; even if, as she notes, ‘we be no-place neer a Century’. 1759 and 1760 are two of the high summers of the European Enlightenment, often boldly proclaimed as one of the most ‘significant historical breaks’⁶¹⁵ in Western civilisation in how human beings imagine, interact with and think about the environment around them (fed by the discoveries and discourses of the previous century). Anne’s life, the people she associates with, and the conflicts that lie at the heart of my narrative are emblematic of this change.

For Anne Latch, the changes wrought by the Enlightenment cannot come soon enough. In her writing, there is a sense of her desperation to see this change arrive in her lifetime, and to witness what has since become an accepted wisdom of transition - from faith to reason, falsehood to ‘Troth’, magic to science, body to mind, organic to artificial – for herself.

Anne’s desires and beliefs, and her great ‘Work’ - the project of taming and working the creature living in the walls of her house – are in their essence a classic perspective both *of* the age and *about* the age. They have their roots in the authoritarian rule of her father over her early life; in the progressive, philanthropic, Romantic Methodism of Mr. Knole, and the proto-feminism in the sermons that his fellow travellers

⁶¹⁵ Josephson- Storm, Jason A. *The Myth Of Disenchantment: Magic, Modernity and the Birth of the Human Sciences*. London: University of Chicago Press, 2017, p. 7.

give to Anne and her co-workers at the mill. It has been mapped by her years of service at that mill; its 'changling stations' representing the beginnings of the mechanisation to come. It is nurtured by the paternalistic altruism of the 'gentleman scholar' Mr. Wainscote, who sees Anne first as curiosity, and latterly as a Pygmalionesque project. In the fragments of scientific knowledge that he provides her – glimpses through crude microscopes, the untranslated *Principia* of Isaac Newton and its theories of 'GRAVITAS' - he confirms in her the importance of 'correlationism'⁶¹⁶ and empiricism: of 'Viewing' things as they truly are.

From these scraps of influence, and with the arrival of the 'Beest' in her home, Anne constructs a natural and social philosophy that is recognisable, in part, as stereotypical of the age. She is a proud advocate of the 'doctrine of historical progress' (as Immanuel Kant has it) 'toward improvement'⁶¹⁷, and away from the weaknesses and 'addlings' of previous eras. For Anne, such weaknesses are manifold: she has lived amongst the 'innertainments' and superstitions, everyday discomforts and primitive gender relations that have, for her (and still for us, often, today) characterised pre-Enlightenment life.

⁶¹⁶ Mackay, Robin 'Editorial Introduction'. *Collapse* 2 (1), 2012, pp. 3- 14, p.4.

⁶¹⁷ Rotenstreich, Nathan 'The Idea of Historical Progress and Its Assumptions'. *History and Theory* 10 (2), 1971, pp. 197 – 221.



Figure 6: The moor itself: a photograph (by the author) of the Derbyshire moorland between Redmires and Stanage Edge, where Anne's story (and the fictional hamlet of Nighthead) is situated⁶¹⁸.

Of all these coming changes, however, Anne most anticipates a new relationship between mankind and what she calls 'the out-of-doors'. Even today, the Enlightenment is often seen as the beginning of mankind's disjuncture from its natural environment: the urbanising and industrialising 'disenchantment' of Max Weber's philosophy⁶¹⁹. For Anne, the barren moorland on which she lives, the 'verie Scullery of the World', stands as evidence of the necessity of this disjuncture. It is 'Foetid', putrid, full of diseases and 'animal Liquids' that cause people (particularly women) illness and misfortune. It is the home of unpredictable, slothful and 'ornery' beasts; the source of the 'addling Ayrs' that 'sikken' and fuel the numerous superstitions of her fellow moorlanders. She can barely contain her contempt for those who see 'Spriggets', 'Defils' and 'Feyries' wherever they look, populating this dangerous and remote place with a raucous 'social imaginary'⁶²⁰.

For Anne, the moor represents what is commonly seen as a 'pre-Enlightenment' landscape⁶²¹: a place that is populated by demons and spirits which exert such a force over the lives and bodies of those who

⁶¹⁸ See Appendix 9, Figure 19.

⁶¹⁹ Sherry, Patrick 'Disenchantment, re-enchantment, and enchantment'. *Modern Theology* 25 (3), 2009, pp. 369 – 386.

⁶²⁰ Hampton, Alexander, 2018.

⁶²¹ Herring, Peter 'The Cornish landscape' *Cornish Archaeology* 50 (1), 2011, pp. 161 – 174, p. 163.

live there; and whose workings are such a mystery that the place takes on theological power, answerable only to magic, ritual and religion. To Anne, the most exciting developments of her 'Age' are those which strip such landscapes of their power: which reduce them to 'soulless mechanism'⁶²², put them to use, depopulate them of their menageries (both imagined and actual), remove any Divine presence, and cancel such terrible agency over the lives of their human inhabitants. As far as she is concerned, the landscape can be left to the new, 'disinterested' aesthetic of the middle classes⁶²³, divorced from any practical, socially-integrated relationship with place. In her more extreme moments, Anne wonders if there is any point to having an 'out-of-doors' at all. When the land is no longer farmed or foraged, and the only people who have use for it are pitiful relics like the cowherd Simon Awlbath - and when everything can be delivered to one's door on the back of a cart - what is the need for a relationship between humanity and landscape? One need never touch, inhabit or traverse such a place ever again: only 'View' it, bloodlessly, detachedly, from one's window.

At the heart of this pathologically intense vision of an 'Enlightened' future – sometimes, too intense for Anne to even articulate – sits the 'Beest' whose appearance inspired it. In Anne's 'View', this creature stands as 'Evidense' of this 'Newly Age's' imminent arrival: a 'Newly sort of Beest', with none of the unpredictabilities, corruptions or troublesome characteristics of living beings – persons – as they currently exist. In its compliance, stillness and faithfulness, in its floating detachment from the world around it, it represents what Anne hopes all living things will come to be in her imagined future – a 'Beest' without 'Beestliness', a person without personality, and a character without character.

⁶²² Garrard, Greg *Ecocriticism*. London: Routledge, 2012, p. 69.

⁶²³ Grier, Michelle 'Kant's Critique of Metaphysics', *Stanford Encyclopedia of Philosophy*, 2018 [Online]. Available at: <https://plato.stanford.edu/entries/kant-metaphysics/> [Accessed: 3rd December 2019].

Of course, the ‘Beest’ is not just a symbol of the approaching, denatured, sterilised ‘iron cage’⁶²⁴: it is a tool for realising it. Anne combines her patchwork education and personal sensibilities with the creature’s behaviours and features to construct her ‘Method’ - a series of almost algorithmic sequences, ‘Receipts’ that allow her to, through the creature, manipulate the mechanical ‘Forses’ behind the World to a variety of ends: comfort, long life, female emancipation and ‘Powre’ over all the world. Through her ‘goodly Work’, nobody will remain subject to Nature’s caprice. Instead, (wo)mankind will master its mechanics, as swiftly and completely as Anne mastered her ‘station’ at Mr. Knole’s mill.

* * * * *

Anne, and others like her then and now, are not incorrect in their circumscription of an intensely imaginative, embodied and (at times) social relationship between humankind and its environment, stretching back into recorded history. Indeed, all evidence points to that relationship being far older still. As Chapter 2 of this thesis delineates, evolutionary processes have privileged a high level of sensory engagement with humanity’s complex, systemic ‘surround’⁶²⁵, generating further ‘cognised’⁶²⁶ simulations, ‘relational epistemologies’⁶²⁷, mental models and extrapolations; embodied processes that, in turn, drive responsive action. This basic circuit of environmental engagement takes narrative (or ‘narrativist’⁶²⁸) form; and it is these adaptive patterns of attention, deduction, and embodied response that form the baseplate of later cultural engagement with spaces, places and ecosystems; the telling of stories which impregnate them with meaning.

In Chapter 2, I further outlined how the human narrative tendency is adapted to privilege certain features of that ‘surround’: that

⁶²⁴ Mitzman, Arthur *The Iron Cage: Historical Interpretation of Max Weber*. London: Transaction, 1984.

⁶²⁵ Emmeche, Claus, 2001, p. 653.

⁶²⁶ Rappaport, Roy, 1999, p. 19.

⁶²⁷ Bird-David, Nurit, 1999.

⁶²⁸ Ryan, Marie-Laure, 2017, p. 528.

is, any perceived intelligent agents in the environment. Such 'hyperactive agency detect[ion]'⁶²⁹ often overcompensates, a 'heuristic sensitivity'⁶³⁰ that causes human beings to frequently detect other agents in the world even where none are present. This fosters what Daniel Dennett calls an 'intentional stance'⁶³¹ towards our environment: a predisposition to see environmental features and systems as governed by, or embodying, intentional, intelligent beings like ourselves. For many thinkers, including cultural geographer Yi-Fu Tuan, these tendencies – manifesting as animism, anthropomorphism, pareidolia and other phenomena - 'lie at the foundation of all human culture'⁶³².

All of those superstitious practices, religious survivals and 'irrational' engagements with place that Anne identifies in her writings have their source in such evolved tendencies. They are the seed of the earliest 'protoreligions'⁶³³, and thus later, established theologies. They have proved advantageous to our species in the extreme, even though such 'Addling', as Anne calls it, is often factually mistaken. They give us a structure for creating 'mnemonic... encod[ings]' of the environment's 'ferocious structural complexity'⁶³⁴. Using the comparable complexities of human social life as a functional metaphor for how the non-human world functioned, early human societies struck upon codes of behaviour and systems of knowledge that served well enough to be continually selected for. The act of rationalising opaque environmental systems as the presence and society of human-like beings, acting in human-like ways with dynamic agency, provided a schematic for not just surviving, but flourishing on a dangerous planet. Such rationalisations were helpful for finding food and avoiding danger, as well as categorising and mapping numinous, 'transcendent or higher truths'⁶³⁵.

⁶²⁹ Barrett, Justin *Why Would Anyone Believe In God?* Altamira: Walnut Creek, 2004, p.31.

⁶³⁰ Blom, Jan Dirk, 2010, p. 48.

⁶³¹ Dennett, Daniel *The Intentional Stance*. Massachusetts: The MIT Press, 1987.

⁶³² Tuan, Yi-Fu 'Escapism', *Archis*, 2002 [Online]. Available at:

<http://volumeproject.org/escapism/> [Accessed 3rd December 2019].

⁶³³ Dennett, Daniel *Breaking The Spell: Religion as a Natural Phenomenon*. London: Penguin, 2006, p. 107.

⁶³⁴ Sagan, Carl. *The Demon-Haunted World*. USA: Random House, 1997.

⁶³⁵ Messer, Ellen 'Rappaport, Roy A', *Encyclopedia of Religion*, 2000 [Online]. Available at: <https://www.encyclopedia.com/environment/encyclopedias-almanacs-transcripts-and-maps/rappaport-roy> [Accessed: 12th March 2000]. Rappaport, Roy, 1999,

The resultant narrative framework was not just a tool for organising knowledge: it facilitated the action *towards* the world that is necessary for our survival. The perceived supernatural agency of the environment – its ability to, unavoidably and emergently, act upon us, and to be acted upon in turn - facilitated a further ‘intentional stance’. If landscapes, their denizens and their abstract processes were perceived, in some manner, as persons, they could be acted upon in ways that are appropriate to interpersonal relations; a suite of actions which human beings are intimately qualified to undertake. Such social interactions between humans and places-as-persons took (and still take) the form of ritual, magical practice and ceremony: ‘the performance of more or less invariant formal acts and utterances’, designed to effect a certain end⁶³⁶.

Anne’s life and times sit at the head of a long, cycling chain of human cultural practice defined by this continuing evolutionary experiment. The ‘relational personhoods’ and zoomorphic, therianthrope practices of hunter-gatherer societies frame hunting as a social interaction and ‘psycho-emotional interdependency’⁶³⁷. Across human culture, we have consistently witnessed the deification of entire landscapes, ecologies, and even abstract processes such as the weather and the seasons. In each case, the systemic environment is seen in terms of another system: that of complex personhood. Features of environments, and entire environments themselves, become ‘siblings and persons’⁶³⁸, human-adjacent ‘vitalities’⁶³⁹, and ‘supernatural agents’⁶⁴⁰; part of a vast ecological drama that serves to ‘symbolize, dramatize, and illuminate aspects of humans’ experience and fantasy’⁶⁴¹. Through ritual, humans can engage with these agents on interpersonal

⁶³⁶ Rappaport, Roy, 1999, p. 24.

⁶³⁷ 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.

⁶³⁸ Robinson, Margaret, 2014.

⁶³⁹ Bennett, Jane *Vibrant Matter: A Political Ecology Of Things* North Carolina: Duke University Press, 2010.

⁶⁴⁰ Dennett, Daniel, 2013.

⁶⁴¹ Daston, Lorraine and Mitman, Gregg. *Thinking With Animals: New Perspectives on Anthropomorphism*. Columbia: Columbia University Press, 2005.

terms: through threats, flattery, torture, gifts and sacrifices, to which the agent may respond in their own particular 'sign language'⁶⁴².

By the 18th century in Europe, much contemporary thought rested on the foundations of an older 'natural philosophy' and 'high magic'⁶⁴³: discourses which themselves relied upon a mixture of ancient scholarship, evolved sensibilities, and Christian teaching. Through literature and experimental 'applied science'⁶⁴⁴, and despite the constant internal struggles of the tradition, scholars were describing and manipulating a systemic environment that was scarcely less personified or possessed of agency than those encountered by 'primitive' societies. These proto-scientists and contemporary 'rationalists' sought to 'scrutinise nature' and master its 'secret forces'⁶⁴⁵⁶⁴⁶. These were often not mechanical forces, but 'the incomprehensible yet present activity of... higher power[s]'⁶⁴⁷: witches and demons, spirits and angels, God and the Devil.

Anne's own polemic is, in a way, an invective against these hidebound features of human culture: and a utopian optimism that they might finally, in her own rational 'Age', be done away with. She looks forward to the time when the 'Ayr's' of the 'Devilled Moor' no longer 'addle' the minds of her fellow countryfolk, causing an 'en-thusiasma' to see things that are not there: a liminal stageset 'resonant' with malevolences and characterful horrors, from 'blacks doggs and Hands flying' to 'blackamoors' and 'Kobolds'. She envisions a world where people do not part with good money for the spells, potions and 'low magic'⁶⁴⁸ of healers, 'nigromancers', cunning folk and what are locally termed 'soilwarps'. For centuries such individuals had been important

⁶⁴² 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.

⁶⁴³ Clark, Stuart, 1999.

⁶⁴⁴ Grant, Edward *Foundations of Modern Science in the Middle Ages*. Cambridge: CUP, 1996.

⁶⁴⁵ Williams, Jeffrey H 'Science, science fiction and science fantasy'. In: Williams, Jeffrey H. *Order From Force*. London: IOP, 2015, pp. 1 – 7.

⁶⁴⁶ Clark, Stuart, 1999.

⁶⁴⁷ Burkert, Walter. *Greek Religion*. Cambridge: Harvard UP, 1985, p. 180. Davies

⁶⁴⁸ Davies, Owen, 2003, p. x.

members of many communities, whose internally-consistent, highly narrativist explications of a personified world called for interpersonal, ritual action in order to make that world 'safer [and] less hostile'⁶⁴⁹. For Anne Latch, however – and for many of her 'elite' contemporaries⁶⁵⁰ – the work of cunning folk in placating unquiet spirits, punishing witches and protecting clients from supernatural influence was, at its very best, the manipulation of the credulous, impoverished and ignorant. For Anne, her own 'Work' is a way to move past such backward, theatrical, 'popular belief[s] and custom[s]'⁶⁵¹. In her 'coming Age', never again will her husband John hear voices in the night air accusing him of doing unspeakable things with the neighbour's girl. Never again will innocent children, out mushroom-picking, be murdered by fearful men who think the 'Holy Ghoast' has come to take them to Hell. Never again will a woman have to leave out gifts for 'brown litle Fellow[s]' to keep unwanted babies from their wombs. By her 'goodly Work' - and the efforts of her obedient servant – Anne seeks to provide an alternative, 'moderne' solution to the problems that underlie such imaginings of landscapes filled with malevolent vitality.

* * * * *

Near the end of her letter to her successor – the young woman who will come to take over this important 'Work' – there is a sense that Anne harbours many uncertainties about what this coming 'Age' might look like or, indeed, whether she will live to see it. By many measures – particularly in light of more-recent scholarship that deconstructs the conventional views of the period – it is arguable whether the 'Age' ever did arrive at all. Many scholars assert that the very foundations upon which the Enlightenment rested were suspect: that the arguments which Anne embodies are a provably over-simplistic 'View' of a far more

⁶⁴⁹ Wilson, Duncan 'Public Asked To Help Hunt For Witches' Marks', *Historic England*, 2016 [Online]. Available at: <https://historicengland.org.uk/whats-new/news/help-hunt-for-witches-marks> [Accessed: 12th March 2020].

⁶⁵⁰ Davies, Owen, 2003, p. 1.

⁶⁵¹ Hutton, Ronald *The Triumph of the Moon: A History of Modern Pagan Witchcraft*. New York: OUP, 1999, p. 84.

'diverse phenomenon'⁶⁵²; one that represents fluctuations, rather than a distinct break, in a continuous spectrum of the 'psychic claims that human beings have made on nature'⁶⁵³.

As Anne Latch's writings reveal, the supposedly clear divide between the older, undistanced spiritual beliefs of the poor and the newly rational, distanced, depersonified position of the rich and educated was rather murkier. Both demographics used cunning folk⁶⁵⁴⁶⁵⁵, and while Anne seemingly believes that her clients share her progressive, 'moderne' view of her 'Beest's' work, evidence abounds that she is categorised alongside the county's other infamous magic-users: just another 'soilwarp', whose 'familiar'⁶⁵⁶ will solve their problems in the old, reliable manner. Indeed, much of Anne's income derives from her wealthier clients: Mr. Wainscote, the kindly gentleman scholar, comes to Anne to relieve his gout, even as he educates her about the new rationalist sciences. Many educated people like him in this period held such seemingly-incongruous beliefs simultaneously, an imaginative state between belief and non-belief that is increasingly well-recognised across various disciplines and discourses.

During Anne's vaunted 'Age Of Reason', the presence of non-human agencies in the environment – the treatment of place as person – was rarely fully believed or disbelieved, neither fully engaged nor 'disinterested'. Instead, it was subject to constant 'tactical improvisation [and] opportunist reinvention'⁶⁵⁷ along an autocosmic 'continuum'⁶⁵⁸ which made it difficult to distinguish (in Anne's words) between the 'addled' and the 'sober'.

⁶⁵² Lloyd, Henry Martin 'Why the Enlightenment was not the age of reason', Aeon, 2018 [Online]. Available at: <https://aeon.co/ideas/why-the-enlightenment-was-not-the-age-of-reason> [Accessed: 12th March 2020].

⁶⁵³ Schama, Simon *Landscape And Memory*. London: Vintage, 1995.

⁶⁵⁴ Davies, Owen, 2003.

⁶⁵⁵ Wilby, Emma, 2000.

⁶⁵⁶ Rose-Millar, Charlotte 'Familiars'. In: Broomhall, Susan (eds.) *Early Modern Emotions: An Introduction*. London: Routledge, 2017, pp. 340 – 343.

⁶⁵⁷ Whitmarsh, Tim 'Mythology In Bits', *London Review Of Books*, 2018 [Online]. Available at: <https://www.lrb.co.uk/the-paper/v40/n24/tim-whitmarsh/mythology-in-bits> [Accessed: 20th March 2020].

⁶⁵⁸ Liao, Shen-yi and Gendler, Tamar, 2019.

In the first case, it is arguable whether the scientific and social foundations of the Enlightenment truly *did* seek to depersonify nature. Isaac Newton, forefather of the Enlightenment (and the navel of Anne's new worldview), was particularly problematic in such matters, participating fully in the 'common epistemic basis'⁶⁵⁹ of magic and science. Scientific advances led to discoveries (particularly in microbiology and ethology) that strained simplistic conceptions of a mechanistic, lifeless natural world beyond the human scale, and do so to this day. Even in the Newtonian, Deist position⁶⁶⁰, the world remained subject to the designs of a deliberating, personified agent, even if He was not involved in its day-to-day operations. Many supposedly rational, educated members of 'Enlightened' society held far less Cartesian beliefs: adopting vibrant 'theosophical and spiritualist'⁶⁶¹ positions which (quite literally) 'Viewed' the world as teeming with angelic or spiritual presences, possessed of secret knowledge or power. Even organised religion was itself not immune: Rector Whitbread, the parish priest who reads horoscopes and 'consult[s] the Lace', is not unrepresentative of the historical record.

In the arts, which had supposedly placed personified and interpersonal responses towards nature into a new, aestheticised sandbox, further complications arise. Anne herself sees these complications second-hand, through the reports of mill-owner Elijah Knole's behaviour, made by his daughter during her visit to Anne's house. Rather than a paragon of 'moderne' rationality and industry, Knole himself becomes just as 'addled' in the face of nature's power. We are left with 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. For Knole, and proto-Romantics like him, the moor is the cowherd's 'Temple', in both the Methodist and Classical sense of that

⁶⁵⁹ Josephson-Storm, Jason A, 2017, p. 14.

⁶⁶⁰ Wigelsworth, Jeffrey R. *Deism in Enlightenment England*. Manchester: MUP, 2013.

⁶⁶¹ Josephson-Storm, Jason A., 2017, p. 119.

term. The moor's fast-disappearing purity in the 'moderne' age – represented by the dwindling fortunes of Simon Awlbatch in the face of enclosures – must be protected at all costs. The behaviour of Knole and his fellow aesthete Rector Whitbread during the Marchand's trial, revealed in the *Housekeeping* (see Chapter 3.6) stand as a symbol of how aesthetic practices towards environment in the 18th century were anything but 'disinterested', depersonified, or distanced⁶⁶²; in this particular case, they arguably cost Sarah and Matthew Marchand, Anne's adoptive parents, their lives.

Several elements of the *Housekeeping*, including the ballad *The Warmth Without The Fyre*, reveal the first stirrings of the new aesthetic responses of the Enlightenment: a trifecta of the picturesque⁶⁶³, the sublime⁶⁶⁴ and the beautiful⁶⁶⁵ which were, in retrospect, anything but distanced from their ritualised and religious antecedents. Evidence abounds in the continuing personification of nature along female or feminine parameters, in order to justify continued exploitation of its resources: in the burgeoning tourism industries, that provided ritualised 'engagement[s] with landscape'⁶⁶⁶ that were frequently framed as characterful narratives of communion with or adversity towards natural forms; in the dualism of humanity and nature charted by the sublime, and the imaginative relationship between the two that challenged human triumphalism and agency in ways both similar and different to earlier religious beliefs; in the Romanticism and subsequent counter-rational movements that appeared in subsequent decades; in this light, the belief that the arts lay in some 'improved' territory beyond action, beyond personification, beyond the everyday 'real', seems now woefully simplistic⁶⁶⁷.

⁶⁶² Ibid.

⁶⁶³ Townsend, Dabeny 'The picturesque'. *Journal of Aesthetics and Art Criticism* 55 (4), 1997, pp. 365 – 376.

⁶⁶⁴ Ginsborg, Hannah 'Kant's Aesthetics and Teleology', *Stanford Encyclopedia of Philosophy*, 2013 [Online]. Available at: <https://plato.stanford.edu/entries/kant-aesthetics/> [Accessed: 20th March 2020].

⁶⁶⁵ Shelley, James, 2017.

⁶⁶⁶ Riding, Christine and Nigel, Llewellyn, 2013

⁶⁶⁷ Shelley, James, 2017.

Even Anne herself is not immune to such overreachings, misunderstandings and contaminations of older, deeper connections with environment. She betrays a myopia in her supposedly-expansive, unimpeded 'View' of the world, through her misreading of Isaac Newton's *Principia Mathematica*⁶⁶⁸, given to her 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 on her 'Beest', have the trappings of a mechanistic, detached rationalism: but one can see that they are just as oriented towards socialised manipulation, placebo and confirmation bias as any practice of 'low magic'⁶⁶⁹ (see Chapter 3.7).

* * * * *

While much of my research focuses on the personification of landscape contemporary to my characters, as Owen Davies states, 'reason has not ended our relationship with magic'⁶⁷⁰. From the 'Counter-Enlightenment' of Romantic thought, already finding its first footholds in Anne's time, to Horkheimer and Adorno's vision of modernism in the early twentieth century⁶⁷¹⁶⁷², there is still much ambiguity around how humanity conceives and interacts with its environments as complex individuals with whom one can have a social relationship. Such ambiguity is debated in the 'new'⁶⁷³ or 'critical'⁶⁷⁴ modes of

⁶⁶⁸ Smith, George, 'Newton's *Philosophiae Naturalis Principia Mathematica*', *Stanford Encyclopedia of Philosophy*, 2007 [Online]. Available at: <https://plato.stanford.edu/entries/newton-principia/> [Accessed: 20th March 2020].

⁶⁶⁹ Davies, Owen, 2003, p. x.

⁶⁷⁰ Davies, Owen, 2009, p. 282.

⁶⁷¹ Shelley, James, 2017.

⁶⁷² Cussen, Ollie, 2013.

⁶⁷³ Harvey, Graham, 2014.

⁶⁷⁴ Burghardt, Gordon 'Critical Anthropomorphism, Uncritical Anthropocentrism, and Naive Nominalism'. *Comparative Cognition and Behaviour Reviews* 2 (1), 2007, pp. 136 – 138.

anthropomorphism and animism across a variety of disciplines; the 'post-Darwinian' turn in many fields of study⁶⁷⁵; the rise of new legalistic concepts of 'environmental personhood'; the persistent ascent of psychogeography, nature writing, econarratology, the 'literature of place'⁶⁷⁶ and their neighbouring genres; the sophistication of fictional world studies in literary theory; the rise of climate literature and the 'literature of the Anthropocene'⁶⁷⁷; and in the interdisciplinary turn toward the 'post-human' and the 'post-humanist'⁶⁷⁸.

This is only a cursory, longitudinal (and admittedly Westernised) sample of the arguable futility of Anne's 'Dreem'. Despiritualisation of the world has always been relative⁶⁷⁹: the 'intentional stance' has been enhanced by the advances of knowledge, becoming 'reconcile[d]... with a certain protomodernity'⁶⁸⁰. There has been constant re-evaluation of what 'personhood' can truly mean, regardless of truth-status, social function, or deterministic prescriptions of belief or non-belief; both within the 'arts', as definitively as they can be defined, and beyond them. Humanity has always engaged with places and spaces as if they were complex, systemic individuals, possessed of agency and volition, and continue to do so. Environments have always, and will always, to some extent be 'resonant' characters in our ongoing, 'autocosmic' narrative engagement with the worlds around us.

⁶⁷⁵ Herman, David *Narratology Beyond The Human: Storytelling and Animal Life*. Oxford: OUP, 2018.

⁶⁷⁶ Smith, Jos *The New Nature Writing: Rethinking The Literature Of Place*. London: Bloomsbury, 2017.

⁶⁷⁷ De Cristofaro, D and Cordle, D. 'Introduction: The Literature of the Anthropocene'. *Journal of 21st Century Writings* 6 (1), 2018, pp. 1 – 6.

⁶⁷⁸ Grusin, Richard *The Non-Human Turn*. Minneapolis: UMP, 2015.

⁶⁷⁹ Josephson-Storm, Jason A., 2017.

⁶⁸⁰ Westphal, Bertrand, Tally Jr, Robert, (trans.), 2007, p. 2.

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

In the spatiality and systemics of the computational mode, historical human engagement with environment and landscape finds only its most recent manifestation. It is beyond the scope of this thesis to determine whether the form's spatial qualities are intrinsic, at the conceptual level, or whether it is merely humanity's best framework for manipulating information, because of our evolved and enculturated sensibilities. Answering such a question would require a deeper analysis of mathematics, cybernetics and systems theory, amongst other disciplines. It is enough to state, as Lev Manovich has it in *The Language of New Media*, that the history of computation - from electromechanical to digital form, from military to civilian application - has seen 'navigable space' become a 'cultural form in its own right... a new tool of labor... a common way to visualize and work with... data'.⁶⁸¹

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 space⁶⁸²; the 'architectures' of AI systems, and the programmers and engineers who stand as 'architects' of these intermeshed physical and virtual topologies⁶⁸³; the manner in which users, in cybernetic feedback with the machine, 'navigate' and 'search' their way through environments composed of information⁶⁸⁴. Computers remain, primarily, a tool for the construction of environments of information, from the representation of the relationships within

⁶⁸¹ Manovich, Lev, 2001, p.45.

⁶⁸² Wertheim, Margaret. *The Pearly Gates Of Cyberspace: A History of Space from Dante to the Internet*. London: W.W. Norton & Company, 2000, p. 229.

⁶⁸³ Koenitz, Hartmut *et al.* 'IDN for Change: Education Approaches and Challenges in a Project Focused on Migration'. In: Koenitz, Hartmut *et al.* (eds.), 2018, p. 591.

⁶⁸⁴ Boechler, Patricia. 'How Spatial Is Hyperspace? Interacting with Hypertext Documents: Cognitive Processes and Concepts'. *Cyberpsychology & Behavior* 4 (1), 2001, pp. 23 – 48.

'abstract information spaces'⁶⁸⁵ and systems, to the simulation of 'physical spaces' both real and fictional⁶⁸⁶.

Computational art, as a specific subset of computation, is a natural home for this environmental engagement: particularly at those points where the spatial and the narrative interpenetrate. In videogames we interact with 'simulated, rule-governed worlds'⁶⁸⁷ as 'graphic realms' of a particular narrativity⁶⁸⁸. In interactive fiction, narrative text becomes a spatial mechanism, a simulated world, to be navigated as a topography of 'twisty little passages' representing the gamut of human experience⁶⁸⁹. Real and virtual spaces are entwined and interpolated in MR and XR artwork, 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'⁶⁹⁰ to preserved or long-gone cultural spaces, in order to understand them in manners different from the study of relics or the reading of texts. In each case, the architects of these 'procedural... participatory... spatial [and]... encyclopedic'⁶⁹¹ worlds, 'ripe with narrative possibility'⁶⁹², 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'⁶⁹³ with place provide the foundations for narrative 'involvement'⁶⁹⁴.

As the previous section remarked, the historical connections between environment and narrative are well-established. However, it can be argued that, in narrative comp-art, this connection is particularly

⁶⁸⁵ Manovich, Lev, 2001, p. 157.

⁶⁸⁶ Manovich, Lev, 2001, p.147.

⁶⁸⁷ Turkle, Sherry 'Video Games and Computer Holding Power' *The New Media Reader* (2003), pp. 499 – 513, p.508.

⁶⁸⁸ Gazzard, Alison 'Unlocking the Gameworld: The Rewards of Space and Time in Videogames'. *Game Studies* 11 (1), 2011.

⁶⁸⁹ Montfort, Nick *Twisty Little Passages: An Approach To Interactive Fiction*. Massachusetts: The MIT Press, 2005.

⁶⁹⁰ Devine, Kit 'testing times: Virtual heritage, 'time travel' and the user experience of museum visitors: a case study of an enriched time-based virtual heritage world'. [PhD Thesis]. The Australian National University, 2016.

⁶⁹¹ Murray, Janet, 1997, p. 87.

⁶⁹² Jenkins, Henry, 2006, p. 671.

⁶⁹³ Moralde, Oscar, 2014.

⁶⁹⁴ Calleja, Gordon, 2011.

important to creating resonance. Much of what is termed 'narrative design' in the field is, at its best, a form of environment design⁶⁹⁵; in which practitioners transform topography and ecologies into what Henry Jenkins calls a 'narrative architecture'⁶⁹⁶. Sixteen years ago, Jenkins identified three main ways in which environmental design in comp-art facilitated 'resonant' narrative experiences: sixteen years later, his taxonomy of embeddedness, enactment and evocation still stands⁶⁹⁷. Narratives remain wedded to the topologies of gameworlds, their traversal, 'environmental storytelling'⁶⁹⁸ and 'epistemological' explorations⁶⁹⁹ mapping closely to both *fabula* and *syuzhet*⁷⁰⁰. The navigation of systemic space is sometimes used more metaphorically, an interactive allegory for other, more complex phenomena. When the 'simulation model' is more dynamic, and less rigidly controlled, narrative scenarios are generated emergently from the simulated environment.

In my gameplay study for this thesis (see Appendix 2), the inextricable link between environment and narrative in comp-art was plain to see in my participants' play, and their own comments on that play. Their attention, their actions, their emotions and their cognition were 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*, 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 which most captivated him. Another participant,

⁶⁹⁵ Fernandez-Vara, Clara, 2011.

⁶⁹⁶ Jenkins, Henry, 2006.

⁶⁹⁷ Ibid.

⁶⁹⁸ Zakowski, Samuel, 2016.

⁶⁹⁹ Chiapello, Laureline 'Epistemological Underpinnings in Game Design Research'. In: Lankoski, Peter and Holopainen, J. (eds.) *Game Design Research: An Introduction to Theory & Practice*. USA: Carnegie Mellon University ETC Press, 2017, pp.16 -33.

⁷⁰⁰ Ryan, Marie-Laure 'Interactive Narrative, Plot Types, and Interpersonal Relations'. *Proceedings of the Joint International Conference on Interactive Digital Storytelling*. Erfurt: ICIDS, 2008, pp. 6 – 13.

making his way through the ‘beautifully-realised’, misty hills of *The Elder Scrolls V: Skyrim*, 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’⁷⁰¹ of the game’s drama: an environmental entity that ‘demands our attention’, that impels us to interact, to ‘know [it]... intimately’, with far more persuasiveness than any other entity within it⁷⁰².

This is not an uncommon reaction to works of narrative comp-art: perhaps, considering the arguments advanced in Chapter 1 of this thesis, it is also not surprising. The weaknesses of character design in narrative comp-art are, in part, linked to the strengths of environmental design. If the key potential of narrative comp-art is to represent something of the *functionality* of the narrative scenario, it is clear that the form is ‘structurally predisposed’ to represent the *functionality* of space, ecologies, environments⁷⁰³, rather than the *functionality* of personhood.

It is arguable (see Conclusion) whether or not space is represented more meaningfully in comp-art; whether we merely tolerate a lower semiotic resolution, and a greater mechanomorphism, from perceived environments than we do from perceived persons; or whether, as Newman advances, we intrinsically and inescapably experience such works as complete systems rather than individuated, identifying characters⁷⁰⁴. The answers to these questions may lie in the subtleties of human evolution. Whatever the case, it is certainly true that, as Bruno

⁷⁰¹ Berry, Noah, 2015.

⁷⁰² Martin, Paul, 2011.

⁷⁰³ Chang, Alenda Y. ‘Playing Nature: The Virtual Ecology of Game Environments’ [PhD Thesis]. California: University of California, Berkeley, 2013.

⁷⁰⁴ Newman, James ‘Playing the system: Videogames/players/characters’ *Semiotica* 173 (1), 2009, pp. 509 – 524.

Dias has it, ‘palaces are cheap, and kings are expensive’⁷⁰⁵: the ‘stock affordances’⁷⁰⁶ of computational time and space are easier to implement than computational character.

As such, practitioners – from risk-averse commercial producers to academic AI developers and cash-strapped solo creatives - often explore the path of least resistance and greatest available resonance: the disparity between environment and character becoming wider as resources and creative effort are ploughed into the former rather than the latter. Characters are neglected as ‘animatronic’⁷⁰⁷ caricatures within a far more resonant, systemic world. Non-human protagonists and deuteragonists prevail, their role as ‘pets, companions, enemies [and] tools’⁷⁰⁸ often suiting a historically-reductive, ‘coldly mechanical’ conception of animal life that has its roots in Enlightenment thought⁷⁰⁹. In works as diverse as *Walden*⁷¹⁰ and Lawrence Lek’s *Dalston, Mon Amour*⁷¹¹, characters are made deliberately absent or firmly preterite⁷¹², the ‘empty... world’⁷¹³ becoming narrativised as an interlocutor, an ‘orthogonal’ access to ‘virtual pasts’⁷¹⁴, or virtual elsewhere. In other works, characters are simplified into massed crowds, whose humanity is only expressible through their manipulation of, and by, their environment. In each case, it is arguable that the simulated environment itself functions as a ‘compelling, albeit unconventional, character’⁷¹⁵ in its own right. In narrative tradition (both aesthetic and mundane) this is

⁷⁰⁵ Dias, Bruno ‘Guest Column: A Garden of Bodies’, *GiantBomb*, 2016 [Online]. Available at: <https://www.giantbomb.com/articles/guest-column-a-garden-of-bodies/1100-5428/> [Accessed: 20th July 2019].

⁷⁰⁶ Bogost, Ian *How To Talk About Videogames*. Minnesota: University of Minnesota Press, 2015.

⁷⁰⁷ Bogost, Ian, 2015.

⁷⁰⁸ Baldwin, Kai ‘Animal Representation in Video Games’, *Animal Instances*, 2019 [Online]. Available at: <https://animalinstances.com/?p=6527> [Accessed: 20th July 2019].

⁷⁰⁹ Joho, Jess ‘Video games are creating smarter animals’, *Polygon*, 2017 [Online]. Available at: <https://www.polygon.com/features/2017/5/17/15442666/videogame-animals-smarter> [Accessed: 17th June 2019].

⁷¹⁰ Fullerton, Tracy *et al. Walden: A Game*, 2018 [Online]. Available at: <https://www.waldengame.com/> [Accessed: 20th November 2019].

⁷¹¹ Lek, Lawrence ‘Dalston, Mon Amour’, *Bonus Levels*, 2012 [Online]. Available at: <http://www.bonuslevels.net/dalston-mon-amour.html> [Accessed: 20th July 2019].

⁷¹² Short, Emily, ‘Inform 7 For The Fiction Author’, *Emily Short’s Interactive Storytelling*, 2007 [Online]. Available at: <https://emshort.blog/2007/06/11/inform-7-for-the-fiction-author/> [Accessed: 20th August 2019].

⁷¹³ Bogost, Ian, 2017.

⁷¹⁴ LaMotta, V, 2012

⁷¹⁵ Martin, Paul, 2011.

nothing new: but what is perhaps novel is the resonance of that environment-as-character compared to the narrative's other, more conventional characters. Often in comp-art, by this thesis' measure of 'resonance', the environment has far more to offer than the beings which inhabit it.

It is at this juncture that I believe applying an 'autocosmic' mindset to the central problem of computational character yields a novel perspective. In this thesis, I have defined an autocosmic philosophy as one by which an artist draws on human engagement with objects, experiences and situations beyond the bounds of their aesthetic remit – beyond the bounds of aesthetics entirely - as models for how their own audiences might engage with their work. In my particular case, I propose that an understanding of how human beings engage with environments as complex, interactive, systemic realities across a range of contexts – often, as complex individuals in their own right – has lessons to teach the comp-artist. It teaches not just why computational environments resonate with audiences, but how such resonance can be co-opted for the creation of another narrative element: that is, computational character.

By drawing agnostically upon research that demonstrates how human beings consistently, throughout history, engage with environment beyond 'the boundary between subjectivity and materiality, agency and passivity', between 'spatial... [and] social reasoning'⁷¹⁶, even between 'characters and settings'⁷¹⁷, I believe a direction for character design that is both computational and resonant emerges. Computational character design can draw on the principles of computational environment design both practically and philosophically. When both environments and characters are considered as examples of 'systemic personhood', whose functionality and structure is intrinsic to their narrative significance, a path through the challenges of computational

⁷¹⁶ Crawford, Chris *Chris Crawford on Interactive Storytelling*, UA: New Riders, 2012.

⁷¹⁷ Eskenlinen, Markku, 2001.

characterisation may be charted. This functional metaphor (in Caracciolo's sense of the phrase⁷¹⁸) of 'character-as-environment' steps away from systemic, formalistic models of personhood grounded in human psychology, or biology, or information science. It does not rely on the unsuitable exemplars of other artistic forms. Instead, it has provided me with a new, 'autocosmic' model for the characters of Project *knole*: characters who partake of the wider, more resonant history of human engagement with place and space.

⁷¹⁸ Caracciolo, Marco. 'Notes for an econarratological theory of character'. *Frontiers of Narrative Studies* 4 (1), 2018, pp.172 – 189.

Section 3.4: Three Approaches To ‘Character-As-Environment’ in Project knole

There are many ways of building upon the previous section’s autocosmic intersections, marrying the design of computational character and computational environment. Some of these are already part of the design lexicon of computational practice, arising wherever the systemic, spatial nature of computational design influences the creation of person-led experiences. For example, the concept of ‘architecture’ - of parts arranged hierarchically within a conceptual space - is intrinsic to the development of many forms of AI: from ‘multi-agent systems’⁷¹⁹ and subsumption architectures, to colony architectures and distributed AI. AI designers often conceive of and build their agents in ecosystemic terms, as an interconnected topography of separate, semi-autonomous or fully autonomous parts experienced as a single ‘entity’⁷²⁰. Merely by using the BOD methodology, itself a synthesis of several of these approaches, the simulated ‘Beest’ is already a spatially-realised collection of computational systems, conceived as a character; the naturalised result of decades of animist design thinking.

Such baseline ecosystemic and spatial paradigms have, of course, filtered into the computational arts more widely. Many digital artworks use topographical and ecosystemic techniques and representations to encourage interpersonal interaction, including Scenocosme’s *La maison sensible*⁷²¹, Petra Gemeinboeck *et al*’s *UZUME*⁷²² and Ian Cheng’s *B.O.B.*⁷²³.

In consumer comp-art (in particular videogames), the methodological ‘shortcuts’ that character-as-environment affords

⁷¹⁹ Wooldridge, Michael *An Introduction to MultiAgent Systems*. Chichester: Wiley, 2009.

⁷²⁰ Russell, Stuart and Norvig, Peter, 2009, p. 43.

⁷²¹ Scenocosme, *La maison sensible*, 2015 [Online]. Available at: http://www.scenocosme.com/maison_sensible.htm [Accessed 20th March 2019].

⁷²² Gemeinboeck, Petra *et al*. ‘Uzume’, EVL, 2000 [Online]. Available at: <https://www.evl.uic.edu/core.php?mod=4&type=1&indi=194> [Accessed: 19th March 2019].

⁷²³ Cheng, Ian *BOB (Bag Of Beliefs)*, 2020 [Online]. Available at: <http://iancheng.com/BOB> [Accessed 19th March 2020].

designers have led to a variety of approaches, with differing degrees of resonance. The archetype of the ‘videogame boss’⁷²⁴ both implicitly and explicitly fuses character and environmental design to create both ‘character [and] mechanism’⁷²⁵, drawing and holding the player’s narrative and strategic attentions through intimate, subtle spatial and interpersonal interaction. Either sewn into their own bounded arenas and ‘self-contained space[s]’⁷²⁶, configured as extensions of their beings, personalities and abilities, or created as ‘living levels’⁷²⁷ to be traversed themselves, in a literal sense; bosses are characters to be engaged mostly through the ‘spatial reasoning’, and environmental exploration, that define the mechanics of the traditional videogame⁷²⁸; a person who becomes a ‘puzzle’, in Newman’s view⁷²⁹.

As explored in previous chapters, other computational artworks provide their own perspective on the ‘character-as-environment’ methodology, both explicitly and implicitly. The Chinese Room’s *Dear Esther* projects the guilt-ridden psyche of the protagonist onto an island landscape⁷³⁰. Kitty Horrorshow’s *Anatomy* uses the traversal of a suburban house to draw parallels with body-horror conventions of transformation and psychosis⁷³¹. Robert Yang often foregrounds the spatialised male body as a site of all sorts of sociopolitical interactions and representations⁷³². In David O’Reilly’s *Everything*, the artist uses simple environmental design techniques to explore a philosophy of life’s interconnectedness, derived from that of Alan Watts⁷³³; conceiving every

⁷²⁴ Suttner, Nick *Shadow of the Colossus: Boss Fight Books #10*. Los Angeles: Boss Fight Books, 2016.

⁷²⁵ Newman, James *Videogames*. Oxon: Routledge, 2013, p.78.

⁷²⁶ *Ibid.*

⁷²⁷ Henaghan, Lee ‘Shadow of the Colossus puts the awe back into awesome’, *stuff.nz*, 20198 [Online]. Available at: <https://www.stuff.co.nz/entertainment/games/101556383/shadow-of-the-colossus-puts-the-awe-back-into-awesome> [Accessed: 20th July 2020]. ‘living levels’

⁷²⁸ Batchelor, James, 2019.

⁷²⁹ Newman, James, 2013, p. 78.

⁷³⁰ Moralde, Oscar ‘Haptic Landscapes: *Dear Esther* and Embodied Video Game Space’. *Media Fields Journal* 8 (1), 2014.

⁷³¹ Douglas, Dante ‘A House of Teeth: On ANATOMY’, 2016 [Online]. Available at: <https://medium.com/@videodante/a-house-of-teeth-on-anatomy-b5139ed2f6a0> [Accessed: 20th July 2020].

⁷³² Yang, Robert and Lantz, Frank ‘Gay Science’, *Open Transcripts*, 2017 [Online]. Available at: <http://opentranscripts.org/transcript/gay-science/> [Accessed: 20th July 2020].

⁷³³ O’Reilly, David *Everything*, 2020 [Online]. Available at: <https://www.davidoreilly.com/everything> [Accessed: 20th July 2020].

object in the (simulated) universe as a member of its *dramatis personae*.

These extant approaches, and others, have certainly influenced the production of Project *knole*. They may form touchstones for any working in this field. However, in *knole* I have looked beyond these exemplars to seek original approaches to the autocosmic precept of ‘character-as-environment’, across all of the project’s narrative modalities.

In the final three sections of this chapter, I explore these approaches towards the resonance of computational characters under three broad headings:

- The design of the simulated ‘Beest’ as a personified computational landscape, both generically and in the specific context of Anne Latch’s narrative;
- The *Housekeeping* as a narrative companion to this landscape, in the tradition of topographical, systemic and computational paratexts and intertexts;
- The interaction of these two previous elements, and the audience’s engagement, in the context of ritualised performance with a living ceremonial landscape.

Section 3.5: The ‘Beest’ As Computational, Personified Landscape

When an audience member approaches *knole*’s installation, there can be little doubt where their attentions, and their interactions, are supposed to be directed. The darkened space, a recreation of the interior of Anne Latch’s gritstone-built house in the village of Nighthead, is almost devoid of any indication that these rooms were once a home. As Anne describes in the *Housekeeping*, in leaving behind her practice she has packed up and carted away almost every scrap of furniture, every hard-won luxury and comfort; every prize of her new-found wealth and fame.

All that remain are the accoutrements and apparatus of her ‘Work’ with the creature; a chalked ‘circlet’, a few guttering candles, a collection of glass phials, and a dusty Book of Common Prayer; all arranged most carefully in orientation with the ‘Fissure’ in the wall where the ‘Beest’ resides. Apart from the dim light of the candles, and the echo of the audience member’s feet on the stone floor, this long crack is the only source of light and sound in the entire space. It is the navel of the entire experience, and the ‘referent’ for which the entire mixed-reality dynamic of the work is provided⁷³⁴. Most properly, the whole analogue space is in continuum with the virtual space rendered on-screen; an almost-empty territory, inhabited by a lone denizen.

The sparse design of the installation space, and the emptiness of the creature’s virtual environment, were deliberate creative decisions. The analogue components of *knole* are not designed to be traversed, or explored, outside of the permitted contexts and contingent interactions defined by Anne’s ritualised relationship with the ‘Beest’ itself. Even within this relationship, the creature has little ability to influence this

⁷³⁴ Ryan, Marie-Laure, ‘Space’, *the living handbook of narratology*, 214 [Online]. Available at: <http://www.lhn.uni-hamburg.de/node/55.html> [Accessed 20th June 2020].

physical space with any formally meaningful utility. While the ‘seams’ between Anne’s world and the Beast’s are deliberately emphasised, their negotiation always pointed and narratively meaningful, the true nature of these negotiations are deeply suspect (see Section 3.7)⁷³⁵.

However, even within its own ‘Relm’, the ‘Beest’ has few of the navigational abilities that are commonly expected in virtual agents; abilities that so often help to define that agency in reference to a containing environment. The Beest floats and bobs, almost stationary much of the time; when it does move, it is only in reference to the audience member sat in front of it. It can move closer to them, or it can disappear into the shadows, on its obscure missions, without friction, effort or visible means of propulsion. The ‘Beest’s’ only navigational lodestone is the audience, or rather Anne herself, and its duties therein. All else is undifferentiated void, except for occasional squalls of weather, and the distant, untouchable moon hanging in the clouds behind the ‘Beest’s’ head.

⁷³⁵ Chalmers, M *et al.* ‘Seamful design: showing the seams in wearable computing’. *IEE Eurowearable*, 2003, pp. 11 – 16.



Figure 7: The 'Beest' in its 'reln': the lack of contextualising environment draws the audience's attention to the physicality of the Beest itself.⁷³⁶

It is this 'tidyness', this lack of territory or camouflage, that in part attracted Anne to the 'Beest' in the first place. For me as a practitioner, its design was a conscious decision to narrow the 'scale of analysis'⁷³⁷, and the narrative focus, away from any computational context beyond the 'Beest' itself. In lacking almost any distinguishable containing environment, the 'Beest' most properly becomes its own environmental context. Unlike many other computational characters (see Chapter 2.2), there is no referential counterpoint, nothing to distract or obfuscate. While the 'Beest' may be the inhabitant of a small, pathological ecosystem, defined by its relationship to Anne and its work, in its presentation it becomes ecosystem and landscape itself; a 'microworld with human significance'⁷³⁸.

In this short section, I will explore some of the other ways in which I have constructed the simulation of the 'Beest' to function, and

⁷³⁶ See Appendix 9, Figure 20.

⁷³⁷ Tilley, Christopher *Interpreting Landscapes*. London: Routledge, 2016, p. 27.

⁷³⁸ Mateas, Michael, *Expressive AI* [Paper], 2000 [Online]. Available at: <https://users.soe.ucsc.edu/~michaelm/publications/mateas-siggraph2000.pdf> [Accessed 19th June 2020].

be perceived as functioning, in ways as much akin to a computational environment as to a computational character. This was not achieved by pursuing new technological approaches to character design, or attempting to devise new system architectures for artificial intelligence. As I have described elsewhere in this thesis, the ‘Beest’ is, in many ways, barely distinguishable in its construction from any typical computational ‘agent’⁷³⁹ in any number of works of narrative comp-art. Using Joanna Bryson’s well-established BOD framework as an instructive base, I pursued a conventional object-oriented approach to agent design; creating each component of the ‘Beest’s’ physical features, and potential reactive and deliberative behaviours, as components in a non-hierarchical network, able to communicate, trigger and influence each other according to a central plan-based control schema. I slightly bastardised Bryson’s model to include a few hierarchical control structures⁷⁴⁰, found in other AI architectures (see Introduction and Section 2.1) to provide some higher-level organisation of the Beest’s emotions, conceptual models and *gestalt* physical state.

My ‘autocosmic’ approach to character design did not involve much modification of these effective exemplars. Instead, I tried to re-frame the philosophy and process of their use; using them to produce a computational character whose algorithmic workings may seem familiar, at the boilerplate, but which would be *perceived* by audiences in a different way. It was an extension of the logical architectures of object-oriented programming into a perceived, personified topography. Such architectures are characterised by the ecosystemic interactions of atomised components, nevertheless designed to produce an overall ‘entity’⁷⁴¹. In the design of the Beest’s biology, the mapping of its form and psyche, and in the modes by which an audience navigates them, the Beest – and Anne herself - may be perceived environmentally, as well as interpersonally.

⁷³⁹ Russell, Stuart and Norvig, Peter, 2009, p.34.

⁷⁴⁰ Bryson, Joanna ‘The Use of State in Intelligent Control’, 2006 [Online]. Available at: <http://www.cs.bath.ac.uk/%7Ejbjb/ftp/sab96.pdf> [Accessed 19th June 2020]

⁷⁴¹ Russell, Stuart and Norvig, Peter, 2009, p. 43.



Figure 8: The simulation's 'debug' screen, showing some of the 'Beest's' hierarchical control structures⁷⁴².

In the first instance, both the Beast, Anne and their containing narrative world were constructed using a distributed, 'bottom-up approach'⁷⁴³ Rather than dictating the design of my characters using a 'top-down'⁷⁴⁴ narrative or computational schema, I instead slowly extruded them from various experimentations. Beginning with the smooth, undifferentiated cylinder of the Beast's underlying form – to some akin to a 'sperpent', to Anne more like a perfectly-milled industrial component – the 'Beest' slowly grew from a loose collection of individual elements to become a 'punctualized'⁷⁴⁵ identity in aggregate. In designing its form – in developing its body parts, their placement, and their interconnection – I was not only building a biology, but that biology's narrative context. In the 'Beest's' form, the entire

⁷⁴² See Appendix 9, Figure 21.

⁷⁴³ Koenitz, Harmut and Louchart, Sandy 'Practicalities and Ideologies: (Re)-Considering the Interactive Digital Narrative Authoring Paradigm'. FDG, 2015.

⁷⁴⁴ Ibid.

⁷⁴⁵ Cressman, Darryl 'A Brief Overview of Actor-Network Theory: Punctualization, Heterogeneous Engineering and Translation'. [Research Paper]. ACT Lab/CPROST, Simon Fraser University, 2009.

‘storyworld’⁷⁴⁶ of knowledge can be mapped; the significant topographies of its setting, the relationships between its characters, and the events and actions which define them.

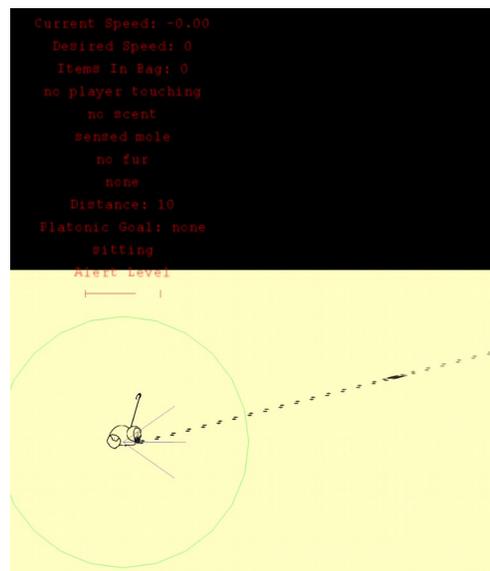


Figure 9: One of the early experiments in creating parasitic sub-agents on the creature’s flesh. Preserved now in the creature’s population of moles, this simulation led directly to the development of the character Simon Aulbatch, the ‘addled’ cowherd upon whom Anne swears revenge⁷⁴⁷.

Through this process, the character of the ‘Beest’, inextricable from these wider narrative concerns, grew into a simulated, topographical model; not only to be navigated by the traditional markers of personhood – what Calleja calls ‘social involvement’ - but also by the waypoints of a narrative environment with which an audience is ‘spatially involved’⁷⁴⁸.

The ‘Beest’, of course, has a face; a collection of brows, a mouth, eyes, and nose, arranged more or less anthropomorphically close to the top edges of the creature’s cylinder-form. My ‘autocosmic’ research (outlined in Chapter 2.2) certainly indicates that such recognisable features serve as important markers for person-oriented engagement

⁷⁴⁶ Ryan, Marie-Laure, 2014.

⁷⁴⁷ See Appendix 9, Figure 22.

⁷⁴⁸ Calleja, Gordon, 2011, p. 83.

with an object, or collection of objects. However, the features of the face are only an arbitrary collection within a flat hierarchy of features arranged across the entire length and breadth of the 'Beest's' body.

As Section 3.7 explores, Anne's instructions and characterisation of the Beest have little anthropomorphic bias; she encourages the audience member to perceive the creature as a wider topography of useful and significant elements rather than a 'person' in any conventional sense. This space is to be navigated in two main ways; either by prodding and dragging the 'Beest' - and thus their field of 'View' - back and forth with an outstretched finger, in a control schema more often encountered in real-time strategy videogames; or, alternatively, with simple barked commands. The audience can even order the 'Beest' to come closer to the 'Fissure', revealing a myopic-yet-microscopic perspective which focuses closely on segments of the creature's 'Fleche' in depersonified, almost-clinical detail. As the audience roams further and further from the face, noting a range of biological features both familiar and strange, they begin to perceive this higher-level 'entity' through new, and conflicting, intimacies.

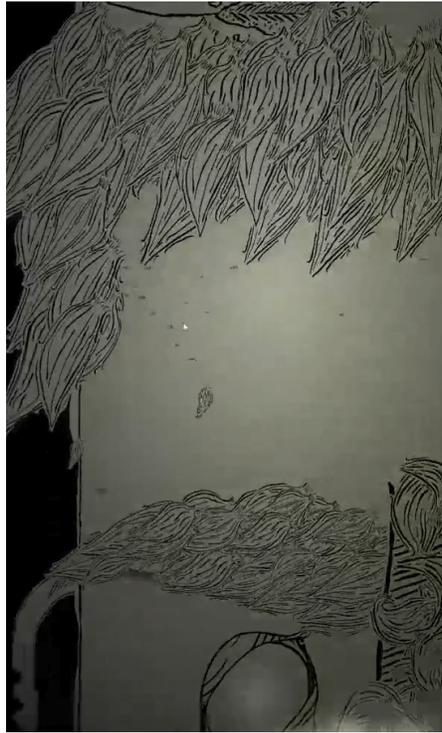


Figure 10: A still from a short animation, showing an audience member calling the 'Beest' to come closer to them, revealing details on the surface of its skin that bear closer inspection⁷⁴⁹.

Through this 'active' traversal, as indeed through their more 'passive' observation⁷⁵⁰, the interconnected ecologies that underlie the Beest's body as a simple 'locator of objects'⁷⁵¹ start to become more apparent. Cycles, patterns and interconnections emerge; audience members will begin to note them, and to incorporate them into their emerging models of this space and its narrative context.

They may witness herds of moles roaming across the 'Beest's' surface, only brave enough to leave the shelter of its body hair after dark; drinking at the ducts of the creature's eyes, or nibbling at the edges of the wounds caused by the audience member's ritual attentions⁷⁵². They may track the spread of strange cankers across its skin like an

⁷⁴⁹ See Appendix 9, Figure 23.

⁷⁵⁰ Keogh, Brendan 'Notes on No Man's Sky', *Brendan Keogh*, 2016 [Online]. Available at: <https://brkeogh.com/2016/08/21/notes-on-no-mans-sky/> [Accessed: 30th June 2019].

⁷⁵¹ Slater, Mel and Wilbur, Sylvia 'A Framework for Immersive Virtual Environments (FIVE): Speculations on the Role of Presence in Virtual Environments'. *Presence* 6 (6), 1997, pp. 603 – 616.

⁷⁵² See Appendix 9, Figure 24.

invasive mould⁷⁵³, or seek the source of the strange, ghostly sounds which seem to emanate from places other than the creature's mouth.

An observant audience member, in concert with the other components of the `knole` experience, may begin to see the correlations between the Beast's' geography, its simulated ecosystems, and the moorland setting within which the wider `knole` narrative takes place. The moonlit horns at the top of the creature's head, often wreathed in cloud and mist, connote the 'two great Stones' which form the focus of so many of the story's events⁷⁵⁴. Its eyes become the millponds in which Simon Awlbach whiles away his afternoons fishing, filled with *muscae volitans* that shiver and react to both environmental conditions and the audience's looming presence⁷⁵⁵. The patches of fur becomes the stunted woods where Mr. Awlbach's cows shelter on rainy nights, and where strange lights glint and flash. The seemingly auspicious arrangements of warts and other blemishes, akin to mushroom rings and stone avenues, become material indicators of the moor's influence on the superstitious minds of its inhabitants. Across, above and through it all hangs the moon, in its carousel of phases, the wind in its strength, the weather in all its moods; all of these features controlled by live API data to match exactly the current environmental conditions of the moors above Sheffield.

Beneath these visible, 'transparent' ecosystems are the buried, arguably-inaccessible landscapes to which they are connected; the creature's desires, emotions and conceptual models. Every one of the creature's body parts and ecological features – in their location, operation and systemic function – are connected in a web of influence and effect to these central controls. The operation and navigation of the 'Beast's' physical landscape thus becomes an interface for the traversal of this invisible underworld; two layers of environment which are

⁷⁵³ See Appendix 9, Figure 25.

⁷⁵⁴ See Appendix 9, Figure 26.

⁷⁵⁵ See Appendix 9, Figure 27.

intricately interconnected. Certain touches and actions, in certain places, elicit contingent emotional and conceptual changes, at a global level, which in turn affect the physical structure of the creature in granular, localised manners. Even passive observation is no longer a neutral practice; the gaze of the audience, tracked with constantly-active webcams built into the installation, can cause the 'Beest' everything from discomfort and shame to pleasure and excitement, depending on its current mental and emotional state. Some areas of the creature are forbidden, taboo, inaccessible; not mediated by any physical lock, but by the refusal of the 'Beest' to show them. To open these locks, keys of a more abstract nature are required; trust, kindness, or intimidation (see Section 3.7).

Of course, it is not only the creature's agency that is present in its simulated body/landscape; Anne has indelibly curated and marked this person/place herself, according to her own character. At every point in an audience member's exploration, the 'formal and associational traces'⁷⁵⁶ of past uses and past presences can be witnessed and excavated; scars, bruises, curious remnants hidden beneath regrown fur; even inked markings which Anne used to help her navigate the entirety of the creature's complex length. Often, however, these traces are not physical, but witnessed only as fleeting emergences of the underlying systems. In the 'Beest's' emotions, reactions and behaviours, Anne's vanished influence is most apparent.

Many of the ideas in this Chapter are explored in more depth in Section 3.7, but it is important for me to delineate the fundamental constructions and conceptions at work in *knole's* simulation. In contextualising the 'Beest' both as landscape and character – a space filled with animist vitality and dynamic agency – a curious mix of 'resonant' intimacies and 'emotional bonds' arise⁷⁵⁷. The inherently

⁷⁵⁶ Champion, Erik Malcolm 'Evaluating Cultural Learning in Virtual Environments'. [*PhD Thesis*]. The University of Melbourne, 2006, p. 57.

⁷⁵⁷ Spence, Jocelyn, 2016, p. 54.

attractive and engaging modalities of environmental manipulation, traversal and mastery mean that the Beast is able to function according to many of the ‘resonant’ principles of environmental storytelling⁷⁵⁸; to become an audience’s focus as an ‘environment of information’⁷⁵⁹, a collection of ‘embedded’ and ‘evoked’ elements, referring to an established narrative, over whose revelation the audience has both manual and interpretative agency.

However, this agency is not merely co-opted in order to reveal a long-inert corpus. The narrative events to which the creature’s body refers are not yet deactivated; they are ‘enacted’, and modified, by the audience’s environmental manipulation. In concert with the ‘Beest’s’ own dynamic agency, a mode of virtual exploration is created which involves not merely a lop-sided exploitation of a fixed resource, but an ongoing, environmental dialogue between two participants in a ‘storyworld’⁷⁶⁰ that is still unfolding. The oscillation between these two states – between the navigation of the living sensitivities of a ‘punctualized’⁷⁶¹ character, and the act of traversing a ‘depunctualized’⁷⁶² environment that is not indifferent to that traversal – comes to form the central narrative tension, and a key source of ‘resonance’, for the project.

⁷⁵⁸ Fernandez-Vara, Clara, 2011.

⁷⁵⁹ Jenkins, Henry, 2004.

⁷⁶⁰ Ryan, Marie-Laure, 2014.

⁷⁶¹ Cressman, Darryl, 2009.

⁷⁶² Latour, Bruno, 2005.

Section 3.6: The *Housekeeping* As Computational Paratext & Intertext

The previous section explored how the simulation at the heart of Project *knole*'s installation was constructed according to principles of virtual environment design. It can thus be interpreted and conceived as a characterised, personified topography or ecosystem, to be navigated according to a mixture of interpersonal and spatial paradigms.

However, such a place, and such a person, is not designed to be approached without any preparation, or to be explored according to random whim. While it is possible to visit the installation alone, and still experience something 'resonant' concerning what is encountered there (see Appendix 1), much of the narrative significance 'embedded' in, and 'evoked' by, the systemic spaces of the 'Beest'⁷⁶³ are made legible and oriented through the context of the *Housekeeping*: the compendium of fragmentary texts relating to Anne Latch and her 'Beest' whose reading is designed to precede and accompany an audience's engagement with the installation. Like many who travel to unfamiliar places, and engage in unfamiliar customs with unfamiliar natives, the project's audiences have at their disposal a collection of textual support, to instruct them in their engagements with the computational environs of the 'Beest'; and, ultimately, to help those environs 'resonate' as intended.

Supposedly published in the same year as Anne Latch's 'vanishment', by the Sheffield 'stationer' William Cryer, the *Housekeeping* is in actuality a variety of texts, by various authors, relating to Anne, her public persona and the 'Famed' circumstances of her life. These texts include broadside ballads, assize proceedings and almanacs as well as (nominally) 'paratextual' material by the publisher; all supporting a central core of writings by Anne herself. The role of the *Housekeeping* in the project was inspired by a close, 'autocosmic'

⁷⁶³ Jenkins, Henry, 2004.

reading of how similar ‘paratexts’⁷⁶⁴ and ‘intertexts’⁷⁶⁵ have functioned, across an interdisciplinary sample of human culture, to enliven, contextualise and enframe human interaction with complex, otherwise-opaque systems; particularly when those systems have become personified, and narrativised, through the influence of those texts.



Figure 11: Examples of paratextual and intertextual forms in the Housekeeping⁷⁶⁶.

The interrelated concepts of ‘paratext’ and ‘intertext’ are structuralist and post-structuralist discourses which attempt to explain how ‘texts’ - in the most general sense of the term⁷⁶⁷ – relate to and explain each other. A ‘paratext’ was originally defined by Gerard Genette as ‘[a text] “beside” the text’⁷⁶⁸; material included that was supplementary to the main text but which ‘suggest[ed]... specific ways of... interpreting’ and navigating it⁷⁶⁹. Genette used this term most narrowly to refer to the various front and back matter in codical books - indices, contents pages, and the like – but the term has become complicated to encompass ‘accompanying productions’⁷⁷⁰ in books and

⁷⁶⁴ Genette, Gerard *Paratexts: Thresholds of Interpretation*. Cambridge: CUP, 1997.

⁷⁶⁵ Kristeva, Julia *Desire in language: A semiotic approach to literature and art*. New York: Columbia University Press, 1980.

⁷⁶⁶ See Appendix 9, Figure 28.

⁷⁶⁷ Lotman, Yuri, 1977.

⁷⁶⁸ Mirenayat, Ali and Soofastaei, Elaleh ‘Gerard Genette and the Categorization of Textual Transcendence’. *Mediterranean Journal of Social Sciences* 6 (5), 2015.

⁷⁶⁹ Birke, Dorothee and Christ, Birte ‘Paratext and Digitized Narrative: Mapping the Field’. *Narrative* 21 (1), 2013, pp. 65 – 87, p. 68.

⁷⁷⁰ Genette, Gerard, 1997, p.1.

other media forms that are not entirely supplementary, nor stand completely outside the ‘storyworld’ or ‘significance’⁷⁷¹, of the originating ‘text’⁷⁷². The term now can incorporate the detailed chronologies and maps often included in fantasy novels, material generated by a participatory audience that is later incorporated into the ‘canon’ of a narrative, and even those transmedial works where the line between ‘paratext’ and ‘text’ is truly blurred: works which ‘tell... tales across multiple media’⁷⁷³ with only a ‘fuzzy threshold between the diegetic and non-diegetic worlds’ of the ‘text’ proper and its supplements⁷⁷⁴.

The related term ‘intertext’, first used by Julie Kristeva⁷⁷⁵ and often related to Genette’s work⁷⁷⁶, considers how separate texts (and, in the work of later scholars, separate elements of the same text⁷⁷⁷) explain and contextualise each other, and how the true significance of any work may only be sited in how texts are present (either explicitly or implicitly) *within* each other.

In my ‘autocosmic’ research into relationships between the human imagination and place (see Section 3.2), I continually encountered examples of paratextual and intertextual relations between these spaces and the artefacts that human beings had created to accompany them. I realised that these exemplars would pair well with my own ‘character-as-environment’ methodology, by demonstrating that complex systemic experiences could be made legible, actionable and significant through a comparative ‘intertext’ or ‘paratext’, external in some way to the systemic experience itself.

⁷⁷¹ Ibid.

⁷⁷² Consalvo, Mia ‘When paratexts become texts: de-centering the game-as-text’. *Critical Studies in Media Communication* 34 (1), 2017, pp. 177 – 183.

⁷⁷³ Jenkins, Henry 2017.

⁷⁷⁴ Rodriguez-Ferrandiz, Raul ‘Paratextual Activity: Updating the Genettian approach within the transmedia turn’. *Communication and Society* 30 (1), 2017, pp. 165-182.

⁷⁷⁵ Kristeva, Julie, 1980.

⁷⁷⁶ Mirenayat, Ali and Soofastaei, Elaleh, 2015.

⁷⁷⁷ Fairclough, Norman *Discourse and Social Change*. Cambridge: Polity Press, 1992.

As such, the *Housekeeping* evolved as a method for exploring and representing these paratextual and intertextual traditions in my own work, supporting the narrative contexts and significances of my computational characters. In its form, the *Housekeeping* is a bricolage of many of the ‘paratexts’ and ‘intertexts’ that I studied, often from outside the narrow band of the literary canon. These included magical grimoires and spellbooks, exploring the populated geographies of the supernatural; their spiritual cousin the recipe book, providing instruction in, and context for, the systemic practices of gastronomy; travel guides and videogame instruction manuals, helping their readers to understand the customs of strange places and peoples, both real and virtual.

As a consolidated artefact, however, the *Housekeeping* draws on these disparate techniques to help audiences ‘resonantly’ operate the simulation as a narrative experience; relying explicitly on the ‘particular’⁷⁷⁸ strengths of the textual form to enhance and support those of the computational.

* * * * *

The *Housekeeping* is a work that attempts to ‘formally imitate’ many of the media forms, ‘text types’⁷⁷⁹ and rhetorical devices of 18th century print culture through ‘intermedial transposition’⁷⁸⁰. These ‘text types’, pressed into a cramped and ‘polyphonic’⁷⁸¹ context, work intertextually with and upon each other, other texts external to the project, and with the simulation of the ‘Beest’ itself. While these various ‘sujets’ vie for rhetorical dominance over the audience’s perception of the ‘fabula’⁷⁸² of Anne’s storyworld, attempting to colour the specific

⁷⁷⁸ Keogh, Brendan, 2015.

⁷⁷⁹ Aumuller, Matthias ‘Text Types’, *the living handbook of narratology*, 2014 [Online]. Available at: <http://www.lhn.uni-hamburg.de/node/121.html> [Accessed: 3rd November 2020].

⁷⁸⁰ Ryan, Marie-Laure, 2014.

⁷⁸¹ Steinby, Liisa ‘Concepts of Novelistic Polyphony: Person-related and Compositional-Thematic’. In: Steinby, Liisa and Klapuri, Tintti (eds.) *Bakhtin and His Others: (Inter)subjectivity, Chronotope, Dialogism*. London: Anthem, 2013.

⁷⁸² Scheffel, Michael ‘Narrative Constitution’, *the living handbook of narratology*, 2013 [Online]. Available at: <https://www.lhn.uni-hamburg.de/node/57.html> [Accessed: 3rd June 2020].

‘resonance’ that the audience brings to their future interactions, they necessarily form a multi-layered narrative discourse, ‘articulat[ing] different sociological, economic or political modes of thought depending on the writers aims’⁷⁸³ - as well as inadvertently revealing more than each writer intended.

The work total variously harnesses the social and political contexts of the broadside ballad, the historiographic value of printed court proceedings, and the narrative strengths of the epistolary form, which had already migrated from everyday correspondence to literary practice partway through Anne Latch’s lifetime. At the centre of the *Housekeeping* is just such a letter, written by Anne; not as a literary device, but as a mundane form of introduction. It is an address to the young woman, known only by her initials stitched in monogram on a handkerchief, of whom Anne has been ‘Dreeming’ for months; and to whom she leaves her home, practice and title (see Appendix 4). Along with Anne’s ‘receipts’ and ‘Instrucktions’, it is this letter which arguably forms the main organising structure of the *Housekeeping* as a narrative document, and the starting point for any divination of its ‘significance’⁷⁸⁴.

⁷⁸³ Knuuttila, Maarit ‘Narrating Cuisines – food stories and paratexts in regional cookbooks’. [Paper], [Online]. Available at: https://www.academia.edu/8774814/Narrating_cuisines_food_stories_and_paratexts_in_regional_cookbooks [Accessed 9th June, 2018].

⁷⁸⁴ Genette, Gerard, 1997, p. 1..

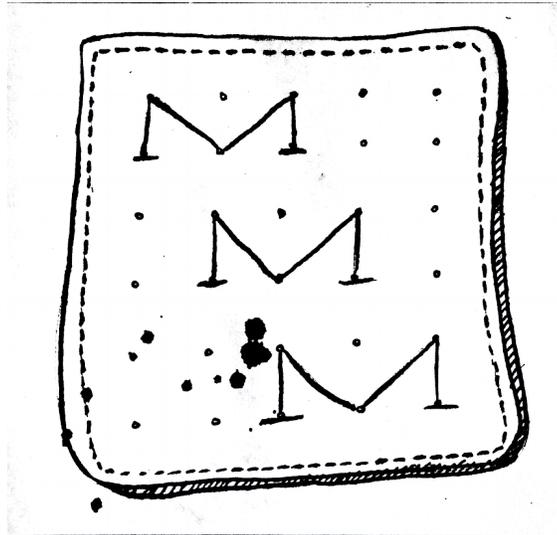


Figure 12: A sketch, in Anne's letter, depicting the monogrammed handkerchief; a 'Dreem' of which prompted her attempt to contact the young woman in question⁷⁸⁵.

Through her letters, her drafting of her working 'Scedule' and her collection of magical recipes, Anne fulfils several rhetorical and utilitarian objectives. She seeks to prepare her chosen successor for the 'Work' ahead, to explain the theory behind her 'Method' and – perhaps unintentionally – to provide a robust defense of her own character.

Even in her chosen 'text types', there is evidence of a curious mix of traditionally masculine and feminine traits which provide an insight into her worldview, and the performative practices which the installation's audience will emulate. As a manuscript of what amount to spells, the *Housekeeping* fits into the overwhelmingly male tradition of the grimoires, magical manuscripts and charms which dominated magical print culture at the time, and which Anne – as a woman seeking emancipation from the strictures of the past – defiantly adopts. Of course, such magical 'receipts' were closely related to the recording of recipes, both herbal and culinary, which had been a traditional preserve of literate women for centuries, and which today is increasingly seen as significant narrative practice. The form has been described as one of the

⁷⁸⁵ See Appendix 9, Figure 29.

only ways for literate women to communicate with each other, record their intellect or ‘gain economic independence and authority’⁷⁸⁶. There is also the flavour of other literary forms in Anne’s work – from the sex manual to the book of conduct – which have their own connotations in the gender politics and rhetorical ‘resonances’ of the day. In (perhaps unwittingly) adopting a pastiche of these interrelated forms, Anne’s writing style and text construction - while ostensibly serving as a simple piece of instructional literature, to be ‘used’ by the audience - reveals much more than it intends to about its author’s context.

Beyond the formal properties of Anne’s writing, the content and style also reveal much more than she, as its author, may have intended. Elsewhere in this thesis I have written at length about the revelations in Anne’s writing, and cannot offer more than a handful of further examples here. In the ‘Scedule’ of her working week with the Beest, the audience can imaginatively simulate the painstakingly-delineated cycles of activity by which Anne’s new life is triangulated. The form of her working week is indelibly influenced by her many years working in Mr. Knole’s mill. Each morning she reads a psalm to her ‘Beest’, as the pious Mr. Knole does to his employees, and the hourly Bell continues to provide a new demarcation of time for a community wholly defined by its industrial purpose. Even the days of the week have been re-labelled (and unthinkingly reproduced by Anne) to reflect the unceasing subdivisions of the Knole mill’s production. In Anne’s list of regular ‘subscribers’ in her ‘Scedule’, there are scores of small, self-contained ‘mini-narratives’⁷⁸⁷; hints of the lives of clients from across many different strata of society whose wants and desires, seeking remedy from Anne’s practice, are inscribed onto the ‘Beest’s’ body (see Section 3.7).

In every aspect, while seemingly providing a document with only referential significance, Anne’s words are impregnated with a deeper narrative significance which invariably colours *how* an audience

⁷⁸⁶ Igra, Alma, 2015.

⁷⁸⁷ Beebee, Thomas O., 1999, p. 6.

approaches the rest of the project. That significance is present in Anne's choice and spelling of words, the prices she assigns to her 'receipts', the ailments that those 'receipts' are designed to cure, her seemingly-cursory mentions of people, and events, long since past, and her obsessive focus on Simon Awlbach, the man she blames for the death of her adoptive parents; both deliberately and incidentally, her text provides a multitude of 'resonant' 'gateways'⁷⁸⁸ into the storyworld.

While Anne entrusted her writing to her publisher Mr. Cryer, to be printed without addition or modification and delivered only to her chosen successor, hers is not the only voice which Mr. Cryer included in the final document. Surrounding and interpenetrated with Anne's writings are the voices of others, raising their own particular perspectives on the 'Wyfe of Nighthead', her Beest and their joint practices. The form of the included ballad, 'The Warmth Without The Fyre', shows the extent of prurient popular interest in Anne's story across the county, and perhaps even further afield. Its writer, a 'goodly Christian' shepherd who bears a striking resemblance to Anne's nemesis Simon Awlbach, takes a proto-Romantic and somewhat patriarchal stance on her activities: imprisoning her within an established superstitious canon of foolish, lustful young women corrupted by the 'false virtual' of demonic forces, threatening the honest 'Toyl' of god-fearing folk, and the reproductive sanctity of 'modern wyves'.

⁷⁸⁸ Gray, Jonathan *Show Sold Separately: Promos, Spoilers and Other Media Paratexts*. London: New York University Press, 2010, p. 18.



Figure 13: The first page of the ballad included in the Housekeeping. The visual assets have been taken from authentic, contemporary ballads available in the Bodleian Ballad Archive⁷⁸⁹⁷⁹⁰.

In the assize proceedings, Anne’s protestations about her role in the deaths of Sarah and Matthew Marchand are placed beneath a forensic, authoritarian lens. After the solipsistic intensity, and almost-hallucinatory confidences, of Anne’s own writing, it is striking to see her made peripheral to the legal conflicts between the Marchands and Simon Awlbatch; a ‘simple, trembling girl’ accompanied by a sickly ‘Hound’, of no interest to a judicial system that has reduced the crime of witchcraft to a matter of fraud, and which has many tens of cases to deal with even on this one, rainy August day.

In its long, exacting detail, the document provides insights into many of the other themes that define the historical context in which Anne was operating, and which overwhelmingly influence the audience’s interpretation of the work entire. Mr. Knole and Rector Whitbread wax lyrical, with a burgeoning Romanticism, about Simon Awlbatch’s pastoral virtues, under threat from enclosure and other reconfigurations of the English countryside. The harsh sentencing of the Marchands reflects changing attitudes towards property laws initiated by the ‘Black Act’ of 1723⁷⁹¹. Of course, the proceedings are not only a particular

⁷⁸⁹ See Appendix 9, Figure 30.

⁷⁹⁰ *Broadside Ballads Online*, 2020 [Online]. Available at: <http://ballads.bodleian.ox.ac.uk/> [Accessed: 20th May 2018].

⁷⁹¹ Thompson, Edward *Whigs and hunters: the origin of the black act*. New York: Pantheon, 1975.

narrative vector, appropriate to a facsimile, pseudepigraphical work such as the *Housekeeping*; they have been converted into something far more instrumental. Overlain on the words of the court clerk are a series of square boxes, filled with gibberish; the ‘amulotts’ or ‘cards’ which form a key part of Anne’s practice, and which Mr. Cryer promised to include in his printing.

if she did ever send her Boast to worry
 Mr. Awbache built Mrs. Lanch was
 seen to Tremble then, seen though were
 she swathed in Blackness
 scarves, many gloves and
 such - Of this were the
 only thing she spoke in
 the Trial entire, being as
 quiet as a Inch above
 so said the Justice; did
 Mrs. Lanch speak that she
 had never sent it to do
 such a thing
 as Were it final asked
 of the Accused if Mrs. Lanch had ever
 sold any Promise or Papers to them -
 Of did they speak that the Truth was
 that Mrs. Lanch were only a simple
 Girl (so the Accused spoke), and named
 son of her own husband, and that
 when she took up with this Boast did
 she seem very Glad - Or to surely her
 had commissioned her a blessing for
 their dead Son, Of of which they had
 named to Free a Guinea.
 as The Jury finally heard Alloo
 from Parties several Of the Prosecutor
 his own Character - both the Rector
 Witnessed Of Mr. Elph
 Knole had been Kom to
 assist for Mr. Awbache
 of whom they did claim
 Friendship of Stewardship
 Both spoke with
 Eloquence of Lyrics as in
 the Dignity of the Man.
 Of Mr Knole was it
 heard that the Prosecutor
 as an House as Endowment
 (so spoke) of a Paragon
 Antiently to all Present in the Art of
 living Frailty by the more Industry
 that God might in-kind. The Rector
 did speak that the Prosecutor has shillie
 to all herdmen a Soil Incomparable Of
 large both of Cooks chaperons being one
 of the few Men of this Country still
 Four-fall of the Lord (in his very
 Words). Both did make Ceremony as
 to Mr. Awbache Chantry Of Parry -
 Of how it was succeeded by the
 Turnall of Advance of Current Times.
 Mr. Knole did speak of the many
 inclosures about the Heath that do
 impede the Prosecutor's Alliance
 business of Rights - Of the Rector
 did speak of meetings he had taken
 with the Prosecutor in which the man
 spoke his fair of theft Of poaching each
 day Alloo, for there be few who
 remain that do resist
 (how Trade close to)
 CUD (so spoke) Mr.
 Knole was satisfied the
 final Matters - Of did he
 take this time to avail
 the Court of a Memoir Of
 God, which did he learn
 in his youth Of has now
 painted upon the walls of
 his Hall - CUD
 THERE IS THE
 METHOD OF THE LORD
 spoke, Mr. Knole then spoke that he
 saw Cook Method most kindly in Mr.
 Awbache, most diligent and Seck -
 Of how that Method might be stalled in
 the loss of his Cooks Materials - Of did
 the Witness fear that such a Low may
 mark the Fall of the last true Oppense
 of the Land.
 as The Justice Of Jury then
 heard these Indiments against the
 Accused, Of the Deposition about the
 Manor Of all the Venes Various - Of it
 is the Justice Present who did rise to
 Present the final Statement. The Justice
 spoke sternly of the number of Incidents
 to which he has been called to Preside
 in this Doerick in the Year past - as
 he spoke, mayhap it a vengeance Of
 speaking for himself the only
 crop that will make in these
 Hills. Then the Justice spoke
 well to state that there be
 many shadows Of darkness
 about the business Of the
 Current Act of the Case named
 - Of you even with the
 Prosecutor's self-suppression (so
 the Justice spoke), by the
 Presentation of
 Reasonable Fact in the
 True Process of the
 King Court - Of by
 Deduction Incomparable -
 the meaning, There may
 be Applied.
 as it is known that
 the Bullock did die by
 a Rightful Of most
 Precise manner of the
 Accused of Mr.
 Lanch Of Hound has there been
 much Doubt - the Justice did speak
 then that he had expected a
 best case to his courthouse,
 full of Scraps for all the
 talk of her. Is it plain
 established that had Mrs. Lanch
 been not Alloo that night
 ye was seen keeping to her
 Husbands house indeed did
 Mr. Johnson speak that she
 was a simple Dog (for
 she Great Bird with Victory over an
 simple Bullock - Of she plainly
 viewed that only much Of Skilled
 application by a Blide might
 manufacture such Wounds.
 as A Disruption of some Minutes
 proceeded hence by which did
 Prosecutor did make
 many Inaugures Of
 Superstition
 Of which Pertained
 Matters, so Vexed was
 Of which Pertained
 not to any of the
 charges of Heath, her
 matters of Vengeance
 some years before - talk
 of Prison - Of did the
 Justice dismiss them Of
 arrange the Proceede
 to Quest let they be entered
 in Record against him.
 as The Justice then
 spoke that it was also known
 that the Accused had openly
 caused the small Matters of
 Mr. Awbache's misrepresentation
 (long since settled) to grow
 within their Minds before that
 day - Of had made Publick
 Inaugures upon him Of open
 whet him Run - While
 words may have no Allegory upon their
 own (so the Justice spoke) the con-burns
 of holding fastness of Mrs. Marchand
 the day has been no Friend to her - Of
 it is had by the fearful View of a Man
 of God that the Of her husband were
 upon the Heath degraded by an absence
 of Light that Night where none of
 their Sort had a business to be - Of a
 it all known that Matthew Marchand
 did always carry with him a Knife of
 which he has much Haters - Of side
 skill of Practice. There remained (so
 the Justice spoke) also the small matter
 that the bullock was found Dead upon
 the highest Point of the Moor, where
 it had little came to be, yet where
 Rates Marchand had been caught
 trespassing lately Of had lost his Life,
 as The Jury then did make their
 Verdict that the Accused did do this
 Thing - Of did Justice Present then
 make the Sentence Under Sentence
 current, the Condemned shall be
 proceeded to the goal as Nightowner
 Town, Of from that goal upon the spot
 of twelve month to a place of Execution
 where shall they be hang the both by
 the neck until they are Dead Of Mrs.
 Lanch it is required that she does repay
 to the Accused store the debt of
 fee of one Guinea, which did
 they pay to them of their Son -
 for so spoke the Justice that it
 may be plainly viewed that she
 had made false Advowment of
 an Ability, Of in the Jury plain
 upon such Matters. Mrs. Lanch
 shall then be left to the mercy of
 the Country, and speak the
 Justice that this had been the
 end of each foolish Mistress in the
 Nightowner.
 do returned Of translated
 by the Magistrate Windy
 August 1794
 [47]
 Here indicted before the Assizes sat
 upon the nineteenth day of August in
 the year seventeen hundred & eighty
 comes one Father - namely James
 Madler of the village of Dinsley in the
 District of Lincoln Town - accused of
 the Rape Negligence of his daughter
 Sally Madler of the same place.
 as The Justice Of men of the Jury
 here Curated have heard of William
 Tams (a physician of that District)
 who did speak that the Prosecutor
 gave with Child which has
 suckled the month gone,
 though she is but a Maid not
 fifteen years of Age - Of that
 all who have Witnessed her
 speak that she has never been
 in the House since Of has never
 had any Man upon her. The
 Prosecutor did speak that one
 Month before she did view
 her Father plainly coming
 from his Work, missing of
 someone in Nether-ton - which does he
 beyond the bullock standing behind the
 House in which they both Dwelt. The
 Prosecutor testified that the Accused was
 more drunk than Ale Of standing
 any the bullock's Peak of making his
 raise Water upon the Slope of singing
 much. Alloo did she re-call that it did
 rain much in the days that Followed Of
 much Legend did come down off the
 bullock by way of Nature. The
 Prosecutor then did speak that her
 Chamber did he upon the Backstone
 walls of the house which do about the
 foot of the Hill - Of that for some
 Month had there been a great Hole in
 the plaster which did admit the Dump-
 shire did profess that he had asked her
 Father to repair the hole many Times
 for she oft spoke surrounded by solid
 Water - yet hardly had he still nor. It
 was viewed that upon that Water of
 some days were her Father had made
 his Water that the Weather had been
 very hot Of Muggish in that Place Of
 had the Prosecutor been drove to sleep
 upon the bare floor of the Chamber
 that Night to cool her Flesh Of

Figure 14: One of the pages of the assizes proceedings included in the *Housekeeping*, showing Anne’s ‘amulotts’ overlain over the original text. The form and rhetoric of this ‘text type’⁷⁹² was inspired by extensive research in the Old Bailey digital archives^{793,794}.

In choosing to overlay these ‘amulotts’ onto a legal document, a text which Anne had no desire or intention to include - full of jargon and specialist, almost-mystical vocabulary - Mr. Cryer is exploiting a continuing sensationalist and superstitious correlation between literate documentation and magical practice. This is only one example of Cryer’s

⁷⁹² Aumuller, Matthias, 2014.

⁷⁹³ *The Proceedings of the Old Bailey*, 2018 [Online]. Available at: <https://www.oldbaileyonline.org/> [Accessed: 20th June 2020].

⁷⁹⁴ See Appendix 9, Figure 31.

modifications of Anne’s original manuscript. Even in reading the title page of the document itself (an insertion entirely of Mr. Cryer’s devising), it is plain that he has no intention of honouring his promises to Anne. Her private writings, intended for an audience of one, have been repackaged, edited and bastardised into a work of entertainment, available to purchase by any ‘Young Miss Con-descending’ for a few shillings.

Through Cryer’s editorial, the indistinction of text and paratext becomes blurrier still. Anne’s three hundred receipts are trimmed to around thirty, their value as a complete and operable transcript of her ‘Method’ lost. Despite her desire to write the whole ‘Troth’ of the world as a piece of visionary amateur science, and to vindicate her reputation, Cryer has reduced her to just another curiosity to be touted to a public eager for scandal or ‘novele’ diversion. As the audience makes their plans to attend the installation, they must concede that it is Cryer who has proved the ultimate author of the *Housekeeping*. They are invited to imagine all those other ‘Young Misses’, clutching their own copies of Anne’s bequeathment, travelling to visit the ‘Beest’ expectant of a new ‘Mistress’ (see Appendix 4).

* * * * *

Through its form, content and ‘function’⁷⁹⁵, the *Housekeeping* provides a ‘polyphonic’⁷⁹⁶ avenue for exploring and contextualising Anne’s storyworld in ways that appropriately support the computational form to which it is allied; offloading some of the narrative burden from the procedural experience itself.

Ideally, an audience will read the *Housekeeping*, downloaded from the project’s website, before they visit the installation, and will thus

⁷⁹⁵ Beebee, Thomas O., 1999, p. 8.

⁷⁹⁶ Steinby, Liisa, 2013.

be primed to parse the simulation through a particular set of narrative lenses. However, I believe it would be a mistake to think of the *Housekeeping* as a static companion to a dynamic work of comp-art: instead, drawing on the work of Newman, I would argue that it forms only a distinct, ‘offline’⁷⁹⁷ segment of a larger computational experience, as well as standing as an ‘extensive intertextual system’⁷⁹⁸ in its own right. Drawing on principles from transmedia and ‘pseudepigraphical’ fiction, the work uses ‘multiple platforms [with]... manifold entry and exit points’⁷⁹⁹ to promote a non-linear textual exploration of the project’s storyworld.

As ‘active readers’⁸⁰⁰, even before they visit the installation, audiences are required to traverse Anne’s narrative landscape; to choose their paths carefully through an ecosystem of competing authorships, ‘focalisations’⁸⁰¹ and intertexts, excavating their own particular interpretation of its qualities. When audiences have undertaken this active engagement with the text, they are prepared to use their own interpretations to ‘resonantly’ guide their encounter with the computational systems which I have built, and to help them overcome the ‘interpretative challenges’ of the work⁸⁰². An engaged reader of the *Housekeeping* will possess a personal literacy in how the interpolated agencies which the texts encode have affected what they are about to experience. They are aware that their engagement with the simulated ‘Beest’ sits at the end of a rich and complex chronology of prior engagements, of battles both ideological and actual fought over its significance; which will, undoubtedly, shape their own encounter.

⁷⁹⁷ Richardson, Ingrid and Keogh, Brendan ‘Mobile Media Matters: The Ethnography and Phenomenology of Itinerant Interfaces’. In: Hjorth, Larissa et al. (eds.) *The Routledge Companion To Digital Ethnography*. London: Routledge, 2017, pp. 211 – 220, p. 212.

⁷⁹⁸ Farrell, Joseph, 2005, p. 108.

⁷⁹⁹ Fleming, Laura ‘Expanding Learning Opportunities with Transmedia Practices: *Inanimate Alice* as an Exemplar’. *JMLE* 5 (2), 2013, pp. 370 – 378, p. 370.

⁸⁰⁰ Bower, Anne L. ‘Dear -----: In Search of New (Old) Forms of Critical Address’. In: Gilroy, Amanda and Verhoeven, W. M., 2000, p. 156.

⁸⁰¹ Niederhoff, Burkhard, 2013.

⁸⁰² Jonne, Arjoranta ‘Interpretive Challenges In Games’. *Proceedings of the 2018 DiGRA International Conference: The Game is the Message*, DiGRA, 2018 [Online]. Available at: <http://www.digra.org/digital-library/publications/interpretive-challenges-in-games/> [Accessed: 20th June 2020].

Of course, there may be audiences who will choose not to visit the installation at all, or be unable to attend one of its scheduled appearances. Instead, a reading of the *Housekeeping* will form a much larger part of their encounter with my work. Even in such a scenario, I trust that the *Housekeeping* stands as its own cohesive textual landscape; referring to a systemic experience that is always experienced in negative, *in absentia*, but which does not entirely fail to ‘resonate’ in that absence.

This role of paratexts to substitute, and suggest, the systems they supposedly support is nothing new. In grimoires and magical texts, the evocations of fabulous costumes, strange genuflections, obscure glyphs and alien proclamations - as well as the intertextual cachet of other magical works (often entirely fictional or pseudepigraphical) to which they allude - help to instill a particular narrative ‘resonance’ in the reader, and an animist conception of the world around them, even if they never intend to actually perform the rituals described. ‘Armchair sorcerers’ imaginatively project themselves into the role of active participant in these rituals, guided by detailed prompts, even actual scripts, of how their encounters with supernatural beings would play out. That such readings only allowed a vicarious mental performance of forbidden acts, and an exploration of forbidden cultures, did not dent their ‘resonance’ - or their saleability.

Other forms of paratext have long exploited the intrinsic narrative value that they possess, apart from their role as referential tools. The concept of the ‘armchair traveller’ is a well-worn one, as is the concept of the ‘literary recipe book’ - less a reference for actual cooking than a source of narrative enjoyment. In defiance of Manovich’s

proclamation that book and computer interfaces are fundamentally incompatible⁸⁰³, instruction manuals for electronic toys and video games have long proved excellent storehouses of suggestive narrative content, often critiqued on their own merits rather than as mere referents; using narrative techniques best suited to the written form. Indeed, some practitioners and scholars explore the legitimacy of consuming an interactive experience *purely* through the paratexts which describe it, and never experiencing the system first-hand⁸⁰⁴⁸⁰⁵. Such readings remain legitimate, if unconventional, engagements with computational or systemic experiences.

* * * * *

Despite the *Housekeeping*'s independence as a narrative document, it remains the case that it was primarily conceived to augment my installation work. Like a videogame manual, its primary reason to exist is to instruct an experience with a dynamic system. While the manual-as-paratext has dwindled in popularity, as videogames have become more capable of doing representational and procedural justice to the storyworlds they simulate, the form remains an object lesson in how paratextual and intertextual material can support, and enhance, the experience of a central procedural system, and 'present... a solution to cultural, economic and technological videogame issues'⁸⁰⁶. As Consalvo writes, videogame manuals thus transcend their roles as explanatory paratexts and became integral parts of a total narrative experience⁸⁰⁷. Their reading influences the audience's imaginative tendencies, often by adopting the rhetorical and formal techniques of other, older narrative media. Manuals have been developed to resemble tourist guidebooks for the simulated worlds of videogames⁸⁰⁸, facsimiles of the personal effects

⁸⁰³ Manovich, Lev, 2001.

⁸⁰⁴ Romero, Brenda 'Train', *Brenda Romero*, 2009 [Online]. Available at: <https://brenda.games/train> [Accessed: 20th January 2021].

⁸⁰⁵ Brice, Mattie, 2013.

⁸⁰⁶ *Ibid.*, p. 281.

⁸⁰⁷ Consalvo, Mia, 2017.

⁸⁰⁸ Miller, Kiri, 2008.

of videogame characters⁸⁰⁹, or as encyclopedias of the monsters or social groups that a player will encounter⁸¹⁰.

For generations of players, these manuals have exerted a ‘certain magic’⁸¹¹; a tactile, anticipatory experience that was integral to their enjoyment of the game. One of the participants in my gameplay study fondly remembered reading the manual of a game he had just bought ‘from cover to cover’ on the bus home. This seems an excellent model for the careful use of legacy media to situate an audience intellectually, emotionally and imaginatively in a comp-art space, even before they have booted up a computer. Some videogame paratexts, as in the case of *Wonderbook’s* book of spells⁸¹² or the bomb defusing manual in *Keep Talking and Nobody Explodes*⁸¹³ become integral parts of the systemic experience itself; textual interfaces of mechanical control, quite apart from being merely ‘texts that must be read in the presence of their referent’⁸¹⁴.

* * * * *

Even if Mr. Cryer never envisaged anybody actually travelling to the village of Nighthead to claim Anne’s home, and her creature, for themselves, this invitation is both implicit and explicit to *knole’s* audience. As a form of paratextual ‘vestibule’⁸¹⁵, the *Housekeeping* prepares and encourages the audience to make a similar sort of journey

⁸⁰⁹ Davis, Ashley ‘The seven best videogame manuals of all time’, *Destructoid*, 2009 [Online]. Available at: <https://www.destructoid.com/stories/the-seven-best-videogame-manuals-of-all-time-158352.html> [Accessed: 20th January 2021].

⁸¹⁰ Khaw, Cassandra, ‘What Are The Best Game Manuals?’, *Rock Paper Shotgun*, 2015 [Online]. Available at: <https://www.rockpapershotgun.com/2015/09/11/what-are-the-best-game-manuals/> [Accessed: 20th June 2020].

⁸¹¹ Carroll, Nilson Thomas ‘The Lost Art of the Video Game Instruction Manual’. *The Artifice*, 2014 [Online]. Available at: <https://the-artifice.com/lost-art-of-video-game-instruction-manual/> [Accessed: 20th June 2020].

⁸¹² *Wonderbook™: Book of Spells, Playstation*, 2020 [Online]. Available at: <https://www.playstation.com/en-gb/games/wonderbook-book-of-spells-ps3/> [Accessed: 20th November 2020].

⁸¹³ Steel Crate Games, *Keep Talking And Nobody Explodes*, 2018 [Online]. Available at: <https://keeptalkinggame.com/> [Accessed: 20th November 2020].

⁸¹⁴ Ryan, Marie-Laure, 2014.

⁸¹⁵ Genette, Gerard, 1997, p. 1.

– to come to the installation, wherever it might be found, in order to assume their role as the ‘Wyfe of Nighthead’, and operator of the ‘Beest’. Once they have arrived, the *Housekeeping* takes on a simpler, utilitarian role: a set of instructions, arrived at through ‘deduction... inescapable’, which show its audience how to manipulate the world’s ‘Forses’ to heal the sick, bring luck to the unfortunate, and control the fortunes of anybody willing to pay for the privilege. Thus, the *Housekeeping* transcends its role as paratext, and fully becomes part of *knole*’s entire mixed reality dynamic, ‘integrat[ing] diverse forms of interface into a single experience’⁸¹⁶. It becomes an enabler of ritual.

In Section 3.2 of this thesis, I briefly discussed ritual as ‘an example of a participatory activity that presents a narrative structure’⁸¹⁷; a set of ‘resonant’ actions that provide a schemata for interacting with, and regulating a relationship with, complex, often-personified environments. The study of ritual has a growing heritage in interactive art and videogames; in Project *knole*, it represents the apotheosis of my ‘autocosmic’ approach. The *Housekeeping* becomes the context, and prompt, for the audience’s ritual performances towards the ‘Beest’-as-environment; a way for the work to ‘not only say something, [but to] do something’⁸¹⁸. Ritual, and the performative experience of that ritual, becomes a method of ‘understanding and designing for the emotionally and aesthetically powerful interactions that involve... perceptions of engagement with digital technology’⁸¹⁹; to use an audience’s embodied interactions within a ‘dense multimedia information space’⁸²⁰ to orient behaviour, provide ‘cultural presence’⁸²¹, and give those interactions towards a personified environment a connective narrative meaning and ‘resonant’, socialised context.

⁸¹⁶ Benford, Steve and Gabriella, Giannachi, 2012.

⁸¹⁷ Ryan, Marie-Laure, 2013.

⁸¹⁸ Tilley, Christopher *Metaphor and Material Culture*. Blackwell: Oxford, 1999, p. 29.

⁸¹⁹ Nam, Hye Yeon and Nitsche, Michael ‘Interactive installations as performance: Inspiration for HCI’. *Proceedings of the 8th International Conference on Tangible, Embedded and Embodied Interaction*, 2014.

⁸²⁰ Manovich, Lev, 2001.

⁸²¹ Champion, Erik, 2007.

In the final section of this final chapter, I will explore how I used the paradigm of ritual engagements with landscape to bring together all of the project's separate elements into an 'enactive'⁸²², 'resonant', character-led experience: the *Housekeeping* as a 'privileged place of pragmatics and a strategy'⁸²³, the topographical/ecosystemic design of the simulation, and the performance of the audience between and across them.

⁸²² Jenkins, Henry, 2004.

⁸²³ Genette, Gerard, 1997, p. 1.

Section 3.7: The Use Of Ritualistic, Environmental Performance In The Audience Experience Of knowledge



Figure 15: An early design for the installation space, with the Beast's 'crack' and Anne's ritual accoutrements clearly visible⁸²⁴.

As an audience member approaches the installation, 'separate from the world at large'⁸²⁵, the space - in its 'corporeal, technological and virtual component[s]'⁸²⁶ - unmistakably broadcasts itself as ritualistic in nature. Anne Latch's material comforts, the usual furniture of an 18th century kitchen, have been bundled up and taken away by cart (see Conclusion). All that remains in the cold, stone-lined space are the bare, deliberated apparatuses of her 'goodly Work'. A few candles have been left burning, in the hope that the 'subscriber', to whom Anne's letter is addressed, will not be tardy in her arrival. A chalked circle, with the word MARIA repeated in tall letters around its edge, holds a handful of strange, almost-innocuous instruments: a Book of Common Prayer, a few phials full of indistinct fluids, and a set of small horseshoes – almost too small for any ordinary horse – strung with red cotton.

Every element of the space is oriented towards, and stands in reference to, the large crack in a facsimile wall, within which the 'Beest' lurks. It has grown from the tiny peephole that Anne describes in her

⁸²⁴ See Appendix 9, Figure 13e.

⁸²⁵ 'Exhibiting Difficult Games', *Matheson Marcault*, 2017 [Online]. Available at: <http://mathesonmarcault.com/index.php/2017/11/16/exhibiting-difficult-games/> [Accessed: 20th January 2021].

⁸²⁶ Keogh, Brendan, 2018.

letter; now it is nearly a meter tall, seemingly ripping the fabric of the house itself apart. A visitor who has read the *Housekeeping* knows something of its significance; knows what it contains. Anybody else will still be drawn forward. It is the major source of light, sound and movement in the room, and full of the sound of the whistling wind, the furtive rustlings of the ‘Beest’, and an electronic warmth radiating off the touchscreen. As the audience member ‘stations’ themselves kneeling, crouching or sitting in the centre of the ‘cirlet’, in front of the crack, their hands passing over Anne’s ceremonial possessions in the near-darkness, they are encouraged into an enactment, a performance, that inculcates a particular cultural view; a tiny, personal and pathological culture, devised between two beings at ‘Work’.

The audience’s engagements with the installation, guided both by the context of the *Housekeeping* and their own curiosity, represent a ‘site-specific performance’⁸²⁷ that in part reconstructs the moral, intellectual and physical universe of *knole*’s storyworld via ‘ceremonial purposes’⁸²⁸. Through ritual practice, and experimentation around these ritual strictures, the work strives to generate character-led ‘resonance’ within a bounded-yet-detailed remit, away from the ‘wide and deep’ character simulations that are so common in comp-art⁸²⁹. This remit, and the extent of its ‘resonance’, is influenced by the audience’s propiocentric, embodied sensitivities, the ‘naturalness’ of the ‘ecology of interfaces’⁸³⁰, the ‘seamful’⁸³¹ crossing and re-crossing of the real/virtual divide, and the systemic nature of the simulation.

There has been increasing consideration of the significance of ritualistic and religious practices in comp-art in recent years. This is unavoidably led by conceptual concerns in interactive and digital art mixed-reality installations and ‘immersive, site-specific and multi-media

⁸²⁷ Mondloch, Kate, 2014.

⁸²⁸ Pryor, Francis, 2015.

⁸²⁹ Salen, Katie and Zimmerman, Eric *Rules Of Play: Game Design Fundamentals*. Massachusetts: The MIT Press, 2004.

⁸³⁰ Benford, Steve and Giannachi, Gabriella, 2011, p. 163.

⁸³¹ Chalmers, M. *et al.*, 2003.

theatre', perhaps owing to the debt of such works to the interests of the modernist and postmodernist art which preceded them. Such discourses have, however, reached the popular field of videogames, via liminal cultures such as interactive fiction and independently-produced auteur works.

knole has both referenced, and contributes to, this body of knowledge. It explores how the performance of ritual as a modality for systemic engagement with character-led comp-art can add to such works' resonant potential. The modality instructs audiences to 'symbolically enact the patterns that give meaning to... lives'⁸³², which in turn creates a 'social' and 'cultural' presence in a work⁸³³. It uses the interactive, systemic paradigm to 'allow [visitors] to see through the eyes of the original inhabitants... [and] pass on cultural knowledge'⁸³⁴. It can provide the 'resonant' link between the manipulation of the base simulation and the narrative contexts within which that manipulation is designed to be sited. At its best, it can make a visceral link to the complex lives of those who inhabit that narrative context through thoughtful, invested performance. In choosing to approach knole, and engage with its intertextual ramifications through concrete actions as a hybrid operator, performer and spectator⁸³⁵, the audience enters into an intimate and specific narrative modality that is both systemic and interactive; coming to devote 'heightened attention'⁸³⁶ to the characters at the heart of my storyworld through the tensions between the 'Beest' as person, and as 'sacred architecture'⁸³⁷.

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⁸³² Fernandez-Vara, Clara, 2009.

⁸³³ Champion, Erik, 2007

⁸³⁴ Champion, Erik 'Worldfulness, Role-enrichment & Moving Rituals' *Transactions of the Digital Games Research Association* 2 (3), 2016, pp. 117 – 143.

⁸³⁵ Spence, Jocelyn, 2016, p. 48.

⁸³⁶ Fischer-Lichte, Erika *The Transformative Power of Performance: A New Aesthetics*. London: Routledge, 2008, p. 168.

⁸³⁷ Champion, Erik, 2015.

The assumed dynamic of the installation experience is the performance of Anne’s ‘Instrucktions’ in the *Housekeeping*; the ‘receipts’ and other painstaking delineations which form the basis of an implied professional practice. It is the performance of these prompts which represent the most straightforward enactment of the ‘character-as-environment’ methodology, as it is realised in Anne’s guiding philosophy. Following Anne’s words reveals, in procedural action, her working relationship with the Beast, and the principles of her philosophy, in their most obvious manifestation.

<i>VI</i>	<i>VII</i>
<p><i>- & shale each Day end upon the Nintenth Bell with these litle Dutys & Fettleings & Mentings applyed unto the <u>BEEST</u> -</i></p>	<p><i>(- & Shale you Lastly leve out fove the <u>BEEST</u> its Suppre if it be Earnt -)</i></p>
<p><i>Shale you scour the Philaments that they shale be tidy & Polyte to soot Visitations - & shale you meke a Dosage to each Orbit of the Abrading Agent, & clense about the Intake for stray soilage with the correckt Soaping - & final agitate all Working Features that they run free & with-out fricting -</i></p>	<p><i>Three droppings Cofee of Saphron - A litle of the <u>Hair upon your Head</u> - One <u>Packing of the Nayl upon your Third Fingre</u> -</i></p>
<p><i>Shale you scutch all the Philaments very Ordered - & shale you clense down the Exhaust of anie Soilage with the Soaping again-</i></p>	<p><i>Five droppings <u>Johns Tamarisk</u> - One fingring of <u>Salt</u> - One fingring of <u>Sugarre</u> -</i></p>

Figure 16: Details from the daily ‘scedule’ for the ‘Beest’s’ work, which forms an implied, authorial backbone to the audience’s interactions with the creature. This was based on research into the traditions of printed almanacks and ‘intelligences’ - tabulations of the unpredictable natural systems governing a pre-digital world⁸³⁸⁸³⁹.

Anne’s directions take the definition of rituals as ‘routines... [and] stylized acts which are adhered to rigidly’ to its logical extreme⁸⁴⁰. The ‘Beest’s’ ‘Working Week’ - mirroring that of Mr. Knole’s mill, where most of Anne’s neighbours (and customers) work – is bounded, mediated and explicitly delineated, measured by the dim sounding of

⁸³⁸ Davies, Owen, 2009, p. 56.

⁸³⁹ See Appendix 9, Figure 32.

⁸⁴⁰ Champion, Erik, 2015, p. 145.

the Mill's bells beyond the walls of Anne's house. Every feature of its 'Relm', and the transactions between that space and the real world, is 'structured, regulated' and unchanging⁸⁴¹, mapped in full and cyclical detail. There are 'scedules' for every activity, from 'fettling' and cleaning the Beest, to feeding it 'Luncheon [and] Suppre', and 'starting it up' to each of the rituals that it is required to perform. This is a short sequence of actions that place the 'Beest' into a fugue-like, mechanistic state, bound to its current task, and entirely subservient to Anne's (or the audience's) ministrations⁸⁴².

No single interaction during these rituals is left to chance. Every touch, genuflection, posture, and gaze is 'controlled, directed and time-regulated'⁸⁴³. Anne sternly counsels against any sort of engagement that is not deliberate, not in aid of some specific activity. The audience is led through the permitted interactions step by 'numbred' step, with precise measurements and genuflections lain out in painstaking detail. Anne prescribes the use of particular fingertips to touch the 'Beest's' flesh at any one time, and only the most homeopathic 'droppings' of the 'tinktures' which are used both as ritual component and as ingredient in the 'Beest's' meals. Like the magical grimoires which Anne professes to despise, the verbal interactions between the audience and the Beest are predetermined, scripted in each instance, fundamentally digitised. Any frivolous or impromptu conversation is reduced to the 'performative utterances'⁸⁴⁴ of talismanic 'Greecke', and the Beest's prescribed, almost-robotic responses, 'in a high and clere Voyce'.

In the first instance, this restrictive, ritualistic approach to character-led interaction had certain practical purposes. As well as providing a sustainable approach to the technical challenges of providing fully-systemic conversational agents, the behavioural constraints imposed by Anne's writing, and by the physical design of the

⁸⁴¹Fernandez-Vara, Clara, 2009.

⁸⁴² See Appendix 9, Figure 33.

⁸⁴³ Champion, Erik, 2015.

⁸⁴⁴Spence, Jocelyn, 2016, p. 26.

installation itself (the boundary and liminal devices of the crack and the ‘circlet’, for example), are designed to help to mediate and control an audience member’s otherwise-unfettered access to the simulated character. It provides a narratively-appropriate context for ‘orchestrat[ing]... their trajectories within certain bounds’⁸⁴⁵, and managing the unpredictability and complexity of social interaction. As in other works that use ritual as an interpersonal interface, it slows interaction, mediates paidic experimentation by players desperate to test the boundaries of the experience, and promotes a respect for the fictive context that should be reflected in the audience’s performance⁸⁴⁶.

However, this reductive, machinistic modality is also a demonstration of Anne’s own character, ‘embedded’ within the ritual context and ‘evoked’ by an audience’s ‘enactment’⁸⁴⁷. In every manner, it broadcasts her beliefs, her physicality, and her personal desires. It is the material and performative evidence of her interactions with the Beast over two years of co-habitation; a set of practices not only designed to mitigate the influence of the unseen ‘Forses’ of the natural world, but to provide Anne with a distinct form of agency in a patriarchal social world. It is a primer for the ‘Newly Age’ that Anne is assured is coming, and a manual of conduct for beings living in that Age. It is a counselling of interpersonal relations free of ambiguity, accident, or characterful chaos.

As Chapter 3.2 of this thesis explored, Anne is a dilettante footsoldier of a particular conception of Enlightenment thinking – one that places an emphasis on ‘Tidyness’, ‘Exactitude’ and ‘Troth’. These rituals are the result of her experiments with this conception; a conjuring of its principles into the material world. By these principles, an intercourse between two living things has become bounded and ‘digitised’, in the most general sense of that term. All the sensuousness

⁸⁴⁵ Benford, Steve and Giannachi, Gabriella, 2011, p. 194.

⁸⁴⁶ Ma, Minhua *et al.* ‘Interact: A Mixed Reality Virtual Survivor for Holocaust Testimonies’. *OzCHI*, 2015, Melbourne Australia.

⁸⁴⁷ Jenkins, Henry, 2004.

of touch has been evacuated, in favour of the depersonalised operation of biological interfaces. All the incriminating ambiguities of speech are reduced to simple, repeatable commands. For Anne, this is not an intellectual exercise; the precision is important because it allows her to protect herself, and other people (especially other women) from the contaminations – and ruinations – that ambiguity brings.

Through these fears, and frustrations, her ritual interactions with the ‘Beest’, performed by the work’s audience, become a form of ‘reality laundering’ - a prophylactic against the uncontrollable ravages of the analogue universe. The symbolic essences of objects, of physical states, are passed or ‘rendered’ between the analogue world of the installation and the ‘tidy... realm’ of the ‘Beest’, ‘an area’ of accountable, predictable, comforting digitality ‘that belongs neither to the inside nor to the outside’⁸⁴⁸. Here, they are neutered, dissipated, sympathetically transferred, through a form of ritualised ‘traversable interface’⁸⁴⁹.

Of course, these stipulations and ‘liminal’ ceremonies are not only to protect Anne’s customers⁸⁵⁰; they also serve to mediate her own relationship with the outside world. Through her operations with the ‘Beest’, she is able to earn an independent living without ever stepping outside her front door; safe, within her father’s thick walls, from the contaminations of the ‘out-of-doors’. Even if those contaminations were to enter her home, carried unwittingly by one of her customers, she is prepared; her ‘Instrucktionen’ always insist that any physical contact with her ‘subscribers’ is done through the contraceptive barrier of a kerchief wrapped around a finger.

* * * * *

⁸⁴⁸ 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: Transcript, 2013, pp. 27 – 50.

⁸⁴⁹ Kolva, Boriana *et al.* ‘Traversable Interfaces Between Real and Virtual Worlds’ Proceedings of the Computer-Human Interaction Conference 2000. ACM, 2000.

⁸⁵⁰ Ryan, Marie-Laure, 2009.

This core dynamic - the performance of Anne Latch's rituals 'exactly thus' in order to actualise her plan for the coming 'Newly Age' of the world – can at times be quite deliberately repetitive, even onerous. Anne's Grand Theory concerning the malign influence of Gravity falls into many of the same 'addled', animist patterns of superstition, of tortured logic, that she despises in the beliefs of others. Her instructions for addressing this theory are long, painfully exact, and sometimes idiosyncratically obscure; qualities recognisable in some of the less-intriguing instructional literature that the audience may have encountered. Though she defiantly notes that 'the Troth shall not fit a handbill' in her letter, Anne rather pointedly does not reveal anything of the mechanics of *how* the creature's powers work; she merely instructs the 'subscriber' to repeat her algorithmic instructions on something approaching faith.

If an audience actually does try to perform the rituals – whether enlisting members of their party to act as customer, or merely following the instructions for their own amusement – they will find the experience decidedly fiddly and puritanical. The rituals forbid far more than they permit, and their completion produces little positive reinforcement for an audience expecting such feedback from their previous encounters with works of comp-art. Their self-contained performances give little sense of progression. Instead, they are part of a cyclic, back-breaking drudgery, an 'endlessly repeatable' algorithm⁸⁵¹; working week after working week stretching out before them, bounded by the same tolling bells, the same dreary busywork, and the same, predictable, restrictive engagements with both the 'Beest' and the outside world. To Anne, this work is necessary, its boundedness and repetition a source of comfort. For the audience, it might become an uninteresting, even an unpleasant, experience.

Perhaps the biggest and most obvious issue arises in how the 'Beest' itself is characterised. In using Anne's instructions as a way to

⁸⁵¹ Ryan, Marie-Laure, 2007, p. 25.

precipitate experience, the portrait of the creature that is both connoted and enacted is limited, almost robotic, and sometimes entirely ‘depunctualis[ed]’⁸⁵². Anne’s words deliberately atomise and reduce the creature to something beneath agency, beneath personhood; they draw the audience on mapped routes from individual waypoint to waypoint across its body, never referring to it in *gestalt* at all. The names for each of its body parts, and the actions that the audience is directed to undertake with them, rely on mechanical and transactional vocabulary that obscure their true nature. The important ritual interface of touch is shorn of its sensual connotations, to become a verb of mechanistic operation. Every possible output that the ‘Beest’ could provide, in speech, biology or behaviour, is seemingly tabulated in advance. Every part of it has been triangulated, mastered and mapped, so that Anne knows it ‘as well as my own Hands, evry Parte’. Despite this, many of the most base markers of individuality – emotion, volition, intentionality, even a recognisable set of features – make no appearance in her rhetoric.

In Anne’s writings, the ‘Beest’ becomes the most reductive realisation of ‘character-as-environment’. It cleaves to the overt, contemporary rationalism which Anne takes as her inspiration; the distillation of complex place, and person, into a series of isolated utilitarian markers, or nodes in a deadened network. Every ambiguity of the ‘Beest’s’ nature is transformed into ‘something manageable, comprehensible and even pedestrian’⁸⁵³. It is a tendency mirrored in many of the least-’resonant’ examples of computational environment design, which encourage players to ‘strip... worlds of interestingness and exoticness, to mine them of resources and ‘newness’’⁸⁵⁴. While for Anne the reification of the ‘Beest’ may be the start of something ‘Newly’, for the work’s audience – for anybody who may have come to take up her ‘Work’, high on the moors – her schematics possess a certain backwards

⁸⁵² Latour, Bruno, 2005.

⁸⁵³ Duncan, Alex ‘Savage Beasts: The Spatial Conflict Between Civilization and Nature in The Elder Scrolls V: Skyrim’, *First Person Scholar*, 2018 [Online]. Available at: <http://www.firstpersonscholar.com/savage-beasts/> [Accessed: 20th January 2021].

⁸⁵⁴ Keogh, Brendan, 2016.

sterility. Rather than an encounter with a person, with all their unpredictable ‘resonance’, Anne’s words prepare them for an experience as mechanical as that of operating the primitive machines which Anne learnt to use when she worked at Mr. Knole’s mill.

Of course, any visitor to the installation will quickly see that the ‘Beest’ is far from the compliant, denatured and deadened topography that Anne describes. In combination with the weaknesses of Anne’s proposed activities – their repetitiveness, their contingency, their lack of flair or rigour – audiences are compelled to move beyond them into a wider, more free-form interactive model. Anne is no longer physically present, in her kitchen; without her ‘authority’⁸⁵⁵ the audience is free to experiment, to play, and to move into the fuller, more ‘ambiguous’⁸⁵⁶ space of the work’s ‘simulation boundaries’⁸⁵⁷. This experimentation deviates from the ludic rigour of ‘fully [taught] ritual practice’⁸⁵⁸ in order to explore a richer set of interactions, and personhoods. As well as revealing the ‘Beest’ as possessed of a more personified, dynamic agency, it also deepens our understanding of the creature as a ritual landscape; a landscape that reveals unintentional ‘Troths’ about the ‘life-worlds’ of its ‘originators’⁸⁵⁹.

* * * * *

In Chapter 3.6 of this thesis, I discussed the intertextuality of the *Housekeeping*, and how it provided ‘resonant’ context for the audience’s installation experience. However, intertextuality is of course not unilateral; texts support, betray and reveal each other in constant exchange, both intentionally and unintentionally. In their ritual engagement with the ‘Beest’, in combination with Anne’s most explicit

⁸⁵⁵ Arsenault, Dominic and Perron, Bernard ‘In The Frame of the Magic Cycle: The Circle(s) of Gameplay’. In: Perron, Bernard and Wolf, Mark J.P. (eds.) *The Video Game Theory Reader 2*. London: Routledge, 2008, pp. 109 – 133.

⁸⁵⁶ Sandry, Eleanor, 2016.

⁸⁵⁷ Smith, Harvey and Worch, Matthias, 2010.

⁸⁵⁸ Champion, Erik, 2015.

⁸⁵⁹ Champion, Erik, 2015.

rhetoric, ambiguities and inconsistencies are tantalisingly revealed in increasing number.

More and more questions are begged. To what do the cryptic labels on the three phials in the installation space refer?⁸⁶⁰ Why does the provided roughspun cloak, which the audience is invited to wrap themselves in if they become cold, smell so strongly of herbs? Why does Anne draw the 'Beest's' 'Temple' - a cluster of moles on its forehead that serves as one of its major ritual instruments - as a 'tidy' square of dots, when in the simulation it is far more chaotic, shaped like a lopsided star⁸⁶¹? Why does the 'Beest' make no other noise than a strangled rasp, despite Anne frequently stating that it will 'spake... in a high and clerely Voyce... verie Exackt'? Why is the 'Beest' so resistant when an audience member tries to explore the lower reaches of its body, or even refuse to show certain body parts that Anne explicitly names in her instructions? The *Housekeeping*, as the initial narrative 'gateway'⁸⁶² into Anne's storyworld, is complicated, even undermined, by the systemic realities of engaging with the simulated 'Beest' in the installation. Anne's confident, overwrought manifesto concerning her 'personal' or 'private religion'⁸⁶³⁸⁶⁴, and her self-characterisation as being above the petty, 'untidy' concerns of the analogue world, become far more ambiguous.

The simulated 'Beest' is deliberately designed to be so ambiguous. It is the exploration of these inconsistencies and ambiguities, 'where the rules are not necessarily quite as clear'⁸⁶⁵, and where the full 'observability' of the simulated object/person is pointedly partial, that drives the work's dramatic and narrative power⁸⁶⁶. In the intriguing possibilities of dissecting, sidestepping or even entirely

⁸⁶⁰ See Appendix 9, Figure 34.

⁸⁶¹ See Appendix 9, Figure 35.

⁸⁶² Gray, Jonathan, 2010.

⁸⁶³ Dennett, Daniel, 2007.

⁸⁶⁴ Hynes, Gerard 'Locations and Borders'. In: Wolf, Mark J.P. (eds.) *The Routledge Companion to Imaginary Worlds*. London: Routledge, 2017.

⁸⁶⁵ Chroinin, Mairead Ni, 2014.

⁸⁶⁶ Costikyan, Greg 'I Have No Words & I Must Design: Toward A Critical Vocabulary for Games'. *Proceedings of the Computer Games and Digital Cultures Conference*, 2002, pp. 9 – 33.

ignoring Anne's ritual instructions in favour of 'improvisation based on the system'⁸⁶⁷, a powerful, performative version of the 'epistemological'⁸⁶⁸ interactions that often define environment design in comp-art is enacted. Through such explorations, a series of tensions are revealed; between the Beest as strategic, 'depunctualized' space, and as an emotive, personified landscape⁸⁶⁹; between Anne as confident mistress of a world transformed, and a victim of trauma burdened by guilt, fear, love and all the buried particularities of a human life; and between a working relationship considered purely transactional, and that relationship as exploitative and pathological - yet curiously intimate.

Thus the audience's performance with the 'Beest', both within the strictures of Anne's rituals and without, serve to archaeologically uncover a micro-culture; a 'spatial text'⁸⁷⁰ that has buried within it 'thematically related events, evidence of social autonomy[,]... focal points of artefactual possession'⁸⁷¹, 'roles, group behaviors and places'⁸⁷². This 'text' can only be understood in the 'activation' of the relations between the 'Beest's' systems, its redolent topography, and the intertexts which reveal those redolences.

However, in performing this 'epistemological' activation⁸⁷³, the audience is not only revealing a static source of information, or parsing data from an unusual yet still-inert form of database. Their exploration of this information also changes it 'ontological[ly]'⁸⁷⁴. In using the creature's body as a 'loci of intimacy and particularity'⁸⁷⁵, as an interface for their explorations, the audience engages in interpersonal, systemic

⁸⁶⁷ Fernandez-Vara, Clara, 2009.

⁸⁶⁸ Ryan, Marie-Laure 'Possible Worlds in Recent Literary Theory' *Style* 26 (4), 1992, pp. 528 – 553.

⁸⁶⁹ Ryan, Marie-Laure, 2015.

⁸⁷⁰ Champion, Erik, 2015.

⁸⁷¹ Champion, Erik 'Norberg-Schulz – Culture, Presence and a Sense of Virtual Place' *In: Champion, Erik (eds.) The Phenomenology of Real and Virtual Places. London: Routledge, 2018*

⁸⁷² Champion, Erik, 2015.

⁸⁷³ Ryan, Marie-Laure, 1992.

⁸⁷⁴ *Ibid.*

⁸⁷⁵ Casey, Edward S. *Getting back into place. Toward a renewed understanding of the place-world.* Indianapolis: IUP, 1993, p. 233.

sociality. The story of the 'Beest' and Anne, a pair of characters 'whose inner lives are rarely easily discerned but warrant exploration'⁸⁷⁶, is not only revealed by the player's actions; as they navigate the Beest's embodied self, it is modified, as well.

* * * * *

The most obvious discrepancy between Anne's writings and an audience member's experience of the 'Beest' in simulation is the apparent nature of the creature's personhood. Anne's 'Instrucktions' in the *Housekeeping* make no direct reference to any emotion, any volition beyond blind compliance, or any personality. However, when sitting down in the installation space, even without 'direct access to the game's algorithm under the surface'⁸⁷⁷, it is quickly evident that the 'Beest' is, in actuality, far less mechanistic a presence than Anne has implied.

⁸⁷⁶ Kidd, David Comer and Castano, Emanuele 'Reading Literary Fiction Improves Theory Of Mind'. *Science* 342 (6156), 2013, pp.377 – 380, p. 377.

⁸⁷⁷Arsenault, Dominic and Perron, Bernard, 2008.



Figure 17: A screenshot of the Beast's face, demonstrating a range of emotions, effluvia and other personified traits⁸⁷⁸.

Though it will perform the rituals as instructed, and seems wedded to its various routines and 'scedules', there is always an apparent impression of resistance and agency; of emotion, wants and mentalities roiling across its features. The Beast is almost overwhelmingly *biological*. It secretes blood, sputum and other effluvia: its skin blushes and marks in response to emotional changes and the ministrations of the audience. It coughs and twitches with a lithe energy; it hates to be left dirty or soiled from the audience's ritual attentions, growing shameful and angry if it is not quickly 'fettled'. It shys from loud noises, and as its mealtimes approach it grows more insistent, and less obedient. It shivers in the cold and the rain, hugging close to the crack and the dry comforts of Anne's kitchen. When it is angry, it bucks at the audience's attentions ineffectually⁸⁷⁹. When it grows tired, its skin grows

⁸⁷⁸ See Appendix 9, Figure 36.

⁸⁷⁹ See Appendix 9, Figure 37.

pinched, its eyes heavy; and, despite Anne’s insistence that it requires no rest from its labours, it thus sleeps, twitching and fitful⁸⁸⁰.

Not all of its responses are negative; it will smile and almost purr at the audience, if it likes them; thrusting different body parts towards the crack, as if willing the audience to touch or operate them. While Anne insists that the ‘Beest’ has no ‘Lust’, or ‘Instruments of Union’, there is certainly something faintly reproductive about some of its biology. Seen in this light, Anne’s instructions to ‘service’ the Beest’s ‘grail’ once a week takes on new, possibly-disturbing connotations.



Figure 18 – The ‘grail’, a sort of fleshy cauldron on the creature’s body that is often used for the making of liquid mixtures that can then be passed into the analogue world and given to a ‘subscriber’⁸⁸¹.

Beneath these more-visible markers of the ‘Beest’s’ personhood lie the mental, emotional and deliberative models that drive its behaviour. Every body part is connected to, influenced by and influences in turn a simple-yet-powerful emotional and cognitive model. Each of the creature’s emotions is constantly present to differing degrees and in differing combinations, in interchange with its physical state, its cognitive models and its reactive and deliberative behaviours⁸⁸². This cognitive model is uncomplicated, even rather barren; perhaps an

⁸⁸⁰ See Appendix 9, Figure 38.

⁸⁸¹ See Appendix 9, Figure 39.

⁸⁸² See Appendix 9, Figure 21.

appropriate choice, considering the creature's isolated and restricted existence. In essence, the 'Beest' has two measures of the state of the outside world, beyond simple bodily indicators such as fuzzy measures of tiredness, pain and other physical states. It represents its opinion of Anne, and its opinion of the audience (in cumulative total), on two fuzzy scales, ranging from negative to positive; a third scale determines how close these two conceptions are to each other; in short, how closely an audience is mimicking Anne's own actions and temperament.

These models, indicators and emotional scales are in constant, interrelated flux, influenced by each other and other sensory stimuli as diverse as the current phase of the moon, the state of the weather, and the perceived actions of the audience. The Beest will even quietly read the emotions on the face of an audience member, using the Microsoft Azure machine learning APIs⁸⁸³, in order to try and divine their intentions towards it. All of these systems serve to create an impression of the Beest that is far more 'punctualized', far more possessed of a dynamic agency, than Anne is willing to admit; even if that agency is bound in service to another, as a form of Stockholm-Syndrome-esque 'social control'⁸⁸⁴.

Like many examples of 'artistic AI', and of simulated environments in works of comp-art, this inner complexity is anything but transparent. A more complete exploration, beyond the most obvious evidences of the 'Beest's' personality, requires a deliberate performative choice. To a lesser or greater degree, the audience must decide whether, and to what degree, they will deviate from Anne's prescriptions. An audience member may choose to continue following Anne's instructions – the only thing close to a manual for explaining the Beest's idiosyncrasies – and attempt to reconcile their actions with the Beest's insistent and obvious personhood. They may try to focus on the

⁸⁸³ 'Microsoft Azure Computer Vision', Microsoft, 2021 [Online]. Available at: <https://azure.microsoft.com/en-gb/services/cognitive-services/computer-vision/> [Accessed: 20th January 2021].

⁸⁸⁴ Champion, Erik, 2016.

distancing, utilitarian language that Anne uses to describe the actions that rituals require; actions which, when performed, reveal themselves to be unkind, unfeeling, even abusive and violent. These actions – from slaps, and prods to cuts, bruises and slaps⁸⁸⁵ – do cause the ‘Beest’ pain, and trauma, and force it to more closely associate the audience member with its memories of Anne. This ‘calbricating’ of its disobedience, in Anne’s words, does have the effect of making the ‘Beest’ more fearful, more subservient and compliant; causing it to act more like the machine that Anne so desperately wishes it would be.

This opaque, inner landscape, glimpsed only in its external effects, defines the boundaries of the creature’s tortured, imprisoned perspective. Though Anne sees the ‘Beest’ as a facilitator of complex, powerful ‘operraytings’ that affect the fabric of the real world, it (of course) does not have the powers that Anne ascribes to it. Like any animal, it instead has the ability to respond, in Pavlovian fashion, to its captor’s patterns of interaction and interference. The Beest fears Anne, and wishes to please her; it has learnt how and when to respond to help avoid pain, hunger or other punishment. In turn, Anne perceives such acquiescence as evidence of her ‘Method’s’ efficacy; and so the cycle of ‘Work’ continues, endlessly, grossly misunderstood on both sides.

Alternatively, an audience member may decide to renege on Anne’s impositions and strictures; to rely instead on the other, tantalising intertextual elements of the *Housekeeping*, in combination with the simulation itself as well as their own curiosities, to engage with the creature as a person more fully. They can refuse to perform the coercive and unkind actions of Anne’s practice, and instead approach the ‘Beest’ with gentleness and respect. A close reading of the *Housekeeping*, for example, will reveal that it likes to have the words of the ballad sung to it, or have its nose stroked. These are actions that Anne discouraged, but which audiences can experiment with for themselves, resulting in the creature’s self-evident pleasure. Other

⁸⁸⁵ See Appendix 9, Figure 37.

visitors may experiment with other attempts at gaining the creature's trust: the provision of food, tender (almost intimate) touches, playful winks, or the avoidance of areas of its body that seem to cause it shame or pain to touch – or even to look upon.

In treating with the 'Beest' as they would any animal – any person – in need of aid, companionship or intimacy, they discover that beyond its institutionalisation, the creature is no different from any person. It has the same basic desires and drives: to be fed, to be warm and sheltered, to be rested and well, and to have physical contact on its own terms. The distanced, clinically utilitarian modalities that Anne prescribes – shouted commands, prodded fingers – become transfigured into tools of intimacy, consciously-chosen acts of kindness, gentleness and restraint.

Through this treatment, the creature becomes more individualistic. This, of course, makes it harder to control; released from its physical and mental imprisonment, it will disappear into the darkness more often, refuse to show parts of itself when commanded, even shrug off or bark truculently when the audience does something that it does not like. The 'Beest', in becoming more of a person, becomes less of a landscape. This becomes a sort of epistemological tax, such that an audience that shows too much kindness will struggle to operate the creature as a 'body of information' to be revealed⁸⁸⁶.

There are many potential strategies for engaging with the 'Beest', between these two extremes; the effect of an audience member's actions are granular, cumulatively in concert with all those who have visited before them (see Appendix 4). The exact nature of their joint performance is, as such, difficult to chart. Whatever a visitor's level of engagement, or understanding of the narrative context of their actions, their interactions with the Beest follow a particular and unpredictable

⁸⁸⁶Jenkins, Henry, 2004

‘trajectory’⁸⁸⁷, defined by their own socialised stance towards what they encounter. It is an encounter that is not quite human-to-human, but is not entirely distant from this either.

Whatever the case, ambiguities persist: ‘the actual meaning’ of the Beest, its relationship to Anne, and the unresolved tensions of their shared narrative, are ‘never revealed, never completely decoded, never fully confirmed’. For the most part, this form of narrative resolution – of exploring the ‘resonances’ ‘embedded’ in and ‘evoked’ by this ‘body of information’ - requires an engagement with the ‘Beest’ that is both depersonalised and topographic, and more pointedly social. While Anne is not physically present in the simulation, every iota of it is coloured by her living influence. To understand Anne as a character, an audience member must to a certain extent triangulate and excavate the ‘Beest’, no matter how resentful, recalcitrant or distressed it may become. Their engagement with the ‘Beest’ is, in pursuit of narrative enlightenment, unavoidably exploitative; a nexus of guilts that must be navigated according to the audience’s own conscience.

If an audience member wishes to fully understand those niggling questions, and inconsistencies, between the ‘storyworld’ as Anne describes it and as it is simulated in the ‘Beest’, they must, to some extent, pursue these ‘uncomfortable interactions’⁸⁸⁸ which ‘move people out of their everyday comfort zone’⁸⁸⁹. They must constantly oscillate between the Beest as atomised, strategic archive, and sensitive, emotional corpus⁸⁹⁰.

* * * * *

What elements of Anne Latch, the architect of this pathological little universe, are revealed in the nexus between *Housekeeping*,

⁸⁸⁷ Benford, Steve and Giannachi, Gabriella, 2011.

⁸⁸⁸ Benford, Steve *et al.* ‘Uncomfortable interactions’. *CHI '12: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 2012, pp. 2005- 2014.

⁸⁸⁹ Spence, Jocelyn, 2016, p. 5.

⁸⁹⁰ Ryan, Marie-Laure, 2015.

simulation and the audience's performance? It might be argued that the Beest is a mirror, a portrait, of Anne's own traumas, obsessions and 'mundane horrors', as much as it is its own, autonomous being. At times, given the confluences between the 'Beest' and Anne's cultural and geographical contexts, it is tempting to wonder whether this creature merely 'apparated' into her life one day, or whether some more deliberative process took place. It is otherwise difficult to explain the topographical correlations between the form of the Beest and the moor, as Anne 'Views' it, outside her front door; hard to countenance the revelations, mostly unintentional, of Anne's character with which it is impregnated, and which can only be glimpsed in negative. Across the creature's form and personality – in its bald patches, its darkening systems, its tenderest regions – there is a 'distinctly situated sense of inhabitation, of social values and behaviors preserved and transmitted through ritual, artefact and inscription'⁸⁹¹.

There is Anne's relationship with her father to consider: a mason by trade who, in his own way, 'manufactured' Anne's sensibilities through his style of parenting. Anne's love of hard 'Work' – indeed, the intensity of her 'industry' with the Beest – grows from her father's own philosophies. In her 'Instrucktions' to shave the Beest every week, before work begins, there are performative echoes of her own father's ablutions. In the stroking of the Beest's nose – often referenced as a mechanistic action, in pursuit of some specific ritual goal – an intertextually-curious audience may recognise Anne's own bedtime rituals as a young girl, when her father would 'stroke my Nose to have me Sleaf - & tolt me that I were the best thyng he eer mede; and would I go out then lyke the Dead -'

In Anne's writing, of course, there are also hints of her father's explosive tempers, as well as his kindnesses; traumatic memories of her father 'raysing such a fingle to her', reconfigured into her own fingers lain against the creature's flesh; a form of disciplinary control, of

⁸⁹¹ Champion, Erik, 2015, p. 148.

‘calbrication’, that does not rely on physical strength, but only deliberate application.

The question of Anne’s mother is dealt with cursorily in the *Housekeeping*, and the wider project; clues and fragments emerge intertextually, preventing the audience arriving at a ‘stable cosmic understanding’⁸⁹². Anne professes herself born out of her father’s own ‘manufacture’, unlike other women who must brave the dangerous and ‘untidy’ business of childbirth. But clues of a buried ‘Troth’ abound, across the project’s different texts; her father’s relationship with his long dead horse, Mary, and her burial under the house; the creature’s evident shame whenever it returns from feasting on this horse’s bones; the word MARIA, used throughout the rituals (and chalked around the ‘circlet’) as a talisman of restraint; the Marchands’ evident loathing of Anne’s father, and the mention of a ‘Misfortune with her Mother’ in the assize proceedings; the rumours and gossip of Anne’s family life in the sensationalist ballad, including claims of a ‘mother’s life bodged’. Hints of a long-forgotten, or long-suppressed, crime abound. It is never explicitly confirmed – perhaps not even recognised by Anne herself in any conscious sense – but it is woven into the very fabric of the storyworld, and its ritual activations.

Similarly, Anne’s complicated relationship with the Marchands, her adoptive parents after her father died, is evident across the project’s various enacted texts. Though she makes little deliberate mention of it in her writing, Anne clearly was deeply attached to, and influenced by, her upbringing by the Marchands; an attachment that extends beyond her words in the *Housekeeping*. In the provision of Matthew’s Marchand’s ‘cloke’ in the installation space, smelling strongly of thyme, we are provided almost-Proustian access to Anne’s memories of being carried, as a small girl, up onto the moor to identify flowers both poisonous and medicinal. In the creature’s playful fondness for winking, we see a

⁸⁹² Vella, Daniel, 2015.

survival of Matthew's playful habits, despite his wife's worries that the Beast would 'come out from my Walls then & Folow them homeward'.

Of course, the event that most overshadows Anne's practice is the trial, and execution, of the Marchands for their supposed involvement in the 'butchery' of Simon Awlbatch's prize bull; allegedly in retaliation for Awlbatch's own role in the death of their son, Robin. As the judge in the assize document states, there are many 'shadows and darkneses about the business'. It is unclear how the bull was killed; whether the Marchands butchered it with Matthew's knife, whether they paid Anne to send the 'Beest' to do the work, or whether it was some other cause entirely. The 'polyphonic'⁸⁹³ representations of the project make it difficult to determine a complete explanation, but assumptions and interpretations can be made.

While Anne suggests, defiantly, that she feels no guilt or responsibility for the Marchand's death, leaving the blame squarely at the feet of the courts, Mr. Knole and Simon Awlbatch themselves, her ritualistic behaviours, preserved in the simulation, seem to suggest otherwise. The 'Decoction of Guinea' - a 'tinkture' which the audience member is instructed to administer, drip by drip, as part of more than one ritual- has redolent connections to the guinea which the Marchands were supposed to have paid Anne for her criminal services; indeed, in the *Housekeeping* it is listed as the exact price for the ritual of 'moggrifying' a man to death. Even the ecosystemic processes of the creature's body - from the flashes of light amongst its fur to the furtive, crepuscular movements of moles - seem to dimly represent a sanitised, archetypal replay of these indistinct events. Anne's ritualistic obsession with revelation, illumination and clarity transform the Beast's body into an endless dissection of the events of that night. Her 'Work' becomes an attempt to pathologically determine the 'Troth' of what occurred, and to rationalise the guilt of her involvement in the deaths of the only people who loved her for who she was.

⁸⁹³Steinby, Liisa, 2013.



Figure 19: *The strange object, buried beneath the large lump on the creature's skin, that resembles the bodies of the Marchands, and which exudes a strange, irritating powder when it is shook*⁸⁹⁴.

Other evidences for Anne's emotional connection to these events can only be divined through performances, or observations, of curious visitors to the installation; they are never explicitly mentioned in any part of the *Housekeeping*. Hidden in a 'clearing' of the creature's pelt is a strange, reddened lump which, when cut open, reveals a curious, shriveled object. This object can be lifted out of the cut in the creature's skin on the tip of an audience member's finger; it sheds a fine black powder, like a pepper pot, as it is swung back and forth. If the audience member looks closely, the faces of two people – possibly of the executed Marchands - can be seen, swaddled in a shroud; and when this object is passed across the 'Beest's' features, it shrinks back with a look of anguish, even guilt; a buried reminder of the consequences of Anne's ambitions.

Other audience members may, upon cutting out the small 'amulotts' that are printed on top of the assize proceedings, begin to rearrange them so that their gibberish begins to coalesce into sense. This rearrangement may begin to reveal snippets of recognisable speech – the last words of Sarah Marchand upon the gallows⁸⁹⁵. In the ballad, the narrator has nothing for contempt for those who 'buy a scrap of Rag',

⁸⁹⁴ See Appendix 9, Figure 40.

⁸⁹⁵ See Appendix 9, Figure 41.

holding the last words of the dead, as an apotropaic charm or healing tincture. Despite her claims of Reason and ‘Troth’, Anne is no less prey to such superstitions. The last words of the closest thing to a mother she ever had – words that reveal all manner of intriguing narrative details – are integral to her ritual practice; a practice that is constituted by obfuscated guilt and sorrow.

* * * * *

One thing that is clear in the *Housekeeping* is Anne’s pity – or perhaps her hatred – of Simon Awlbach, the superstitious cowherd who is perceived as the engine of so many of the dramas in Anne’s life. The various texts of the work delineate his role in the deaths of Sarah and Matthew, his continuing ‘calumny’ against Anne, and (perhaps most enduringly) what his existence symbolises; the old, ‘untidy’ world, conducted ‘Abroad’ in the open air by the arrogant ‘confidences’ of men in simpering, wretched betrothal to the land.

Anne insists that she has no grudge to bear against Awlbach; however, her behaviours, as preserved in the dynamic of the simulation, do not match her words. Two paired ‘receipts’ in the *Housekeeping* point to Anne’s involvement in a failed attempt on Awlbach’s life by the Marchands; a failed attempt that resulted in the death of Awlbach’s bull, rather than the man himself. One ‘receipt’ offers to ‘moggrify’ a man, and the other a bull; the witness’ description, in the assize proceeding, provides a fitting description of what such ‘moggrifying’ might entail. The two ‘receipts’ differ in only one ingredient; the colour of the mole that must be plucked, in sympathetic correlation, from the top of the creature’s head; an area that shares many qualities with the heights of the moor, with its ‘two great ‘Stones’, where Mr. Awlbach’s bull was found⁸⁹⁶. The court rejects Mr. Awlbach’s claims that his life is in danger; that he has been followed and ‘overlooked’ by a great bird, hanging in the sky. In a rationalist age that has moved beyond

⁸⁹⁶ See Appendix 9, Figure 26.

condemnation of witchcraft as true sorcery, Anne poses little threat in this regard. Following the Marchand's execution, Simon Awlbatch thus returns to his weekly rounds, up and down the moor; migrations that are painstakingly, forensically scheduled by Anne, and which are mirrored in the shifting position of a single, reddish mole across the 'Beest's' own flesh. If Anne does seek revenge against Awlbatch through this particular receipt – to descend upon the reddened mole and pluck it, like a bird out of the sky – she is careful not to counsel it too openly; but she is confident, she writes, that there are 'no more Mistekings in the Method'. If the 'subscriber' chooses to finish the job that Anne started, it will be their own decision.

* * * * *

Simon Awlbatch is, however, not Anne's most pressing intention in her practice. Much of her work, understandably, concerns the support and emancipation of her fellow woman; in her own personal cosmology, those most vulnerable to Gravity's misogynistic influence. In reading the *Housekeeping*, an audience member can see delineated the range and number of women who visit Anne to gain some form of reproductive agency. Through her 'receipts' these women find quick, safe and convenient methods for controlling the lust of men, for detecting pregnancy in the earliest instance, and for stopping that pregnancy if it is unwanted, before the child is 'quicken'd'. Anne's customer base is no different from the clients of other, contemporary cunning folk in this regard.

However, any audience member who attempts to *perform* some of these rituals will be quickly frustrated. They almost all involve performing actions that take place some distance down the creature's body, in a region that the 'Beest' is hesitant, even distressed, to reveal. Anne herself makes a passing comment that, in the weeks before her departure, the Beest has come a little 'headshy' to perform some of these duties.

There are many ways for an audience member to reveal this part of the creature's body; through intimidation, kindness, brute force, or a combination of the three. If they manage to gain access to this region, they quickly learn the reason for the creature's hesitance and 'head-shyness'. While Anne describes the creature's body as almost impossibly long – spreading beneath the entirety of the county, by some reckonings – here the 'Beest's' 'length' abruptly ends in a tattered, bloody stump, floating in the blackness, dripping blood and viscera.



Figure 20: The abrupt ending of the 'Beest's' body in a bloodied, tattered stump⁸⁹⁷.

The lateral scars that surround the stump, and Anne's 'Instrucktions' for several of her pregnancy-related rituals – calling for small incisions to be made in this location, on the creature's flesh - reveals the awful burden of Anne's prophylactic practice. So many

⁸⁹⁷ See Appendix 9, Figure 42.

women have come to claim this new form of emancipatory agency, that these small incisions have accumulated into what, in effect, is a decapitation. It is now clear why the Beast struggles to speak in its 'high and clerely Voyce'. Whether Anne knew about this effect of her attentions, or whether it influenced her decision to leave, is never established. But she does leave, abandoning the creature to a slow death, and implicitly 'instruckting' her successor to decide what to do next.

The creature does die, slowly, in real time, as the simulation runs, in between the ebb and flow of visitors to the installation. It is an inevitable death, measured in coded variables. As the creature fades, its topography, ecology and represented behaviours begin to change. It sheds more fur, and more of the small, 'untidy' clusters of cankers and wens grow across its flesh. It starts to uncontrollably twitch, like a malfunctioning machine, and becomes more tired and lethargic. Its emotional states fade to almost microscopic levels, and it stops resisting the audience's interferences; in effect, it allows itself to be worked without complaint or personality. This presents a further complication of any 'trajectory' through the work⁸⁹⁸. Should an audience continue their explorations of the 'Beest's' secrets, or do they attempt, instead, to provide a sort of palliative care; narratively unsatisfying, but perhaps the kindest approach to a person in distress?

No amount of kindness can save the creature. With a final, scheduled flurry of twitches and ineffectual pining, its 'Work' comes to an end, and its body sinks down, irretrievably, into the depths of its 'reilm' - suddenly subject to the patient, constant pull of gravity once again.

⁸⁹⁸Benford, Steve and Giannachi, Gabriella, 2011.

"This goodly Work"

*Concluding, And Continuing, Project *knole**

Anne Latch signs off her letter to her long-dreamt-of 'young Miss' with a blotted signature, the ink drawn inexorably down the page by gravity's pull. It is the last part to be written before her manuscript is Packett[ed]' and sent down to Mr. Cryer in the city below; and Anne's tone is measured, even sanguine. She has nearly finished packing away the 'moderne' trappings of her late career, and is ready to leave Nighthead, and her father's beloved home, behind. Despite all her careful ministrations, and her supposed prophylactic powers, there is a child growing inside her; her enemy 'Gravitas' has defeated her at last, jealous of her work to control him.

She can already sense the 'regard of the County' shifting against her. Paired with her notoriety after the trial of the Marchands, and the ballads 'on the lipps of the boys like calentures', she has grown weary of the disapproval of others. Her husband John has left the marital home, convinced that after six years of marriage and no issue the child must belong to another; either the ever-present Mr. Wainscote, some other opportunistic 'subscriber', or even the 'Beest' itself. Soon, Anne will become what she has always hated the most; a patriarchal caricature of a woman, reduced to her treacherous and unpredictable biology, and subject to the idle whims of the 'Forses' that govern the world.

Anne, of course, defiantly insists that she feels no shame, or fear, at this new 'station' in her life. Her anger, guilt, sorrow and traumas are cosseted and stifled in a cloak of superciliousness, weary superiority and, ultimately, blind confidence. While some may see her life as drudgery, rather than emancipation – just a more exotic sort of 'housekeeping' - Anne leaves Nighthead more convinced than ever of the value and 'Troth' of her 'Work'. With the help of 'Mr. Cryer', the

procedures that she has developed with the ‘Beest’ will continue to be available to those who need it; especially to her fellow woman, who has ‘had... no salary but a screaming babby, & has moggifried nought but Milk unto Buttre’.

She is still uncertain about where she will go. Perhaps, she concedes with not a little defeatist flair, she shall ‘go where Gravitass may whim me, alyke a Stone upon the Brook’. Of course, for Anne all that matters is that the young woman from her ‘Dreems’, her supposed ‘subscriber’, will climb the ‘Auld Road’ to Nighthead, take up their unexpected inheritance, and continue Anne’s ‘goodly Work’. How, in the light of what she has ‘Viewed’, could she refuse?

* * * * *

As I come to the end of my own work on this project, I find myself slightly more self-reflective (and hopefully less deluded) than my own character. I present Project *knole* – a work of fiction, practice-based research and an ‘inspirational artistic probe for human-computer interaction’⁸⁹⁹ – as an original approach to a specific and long-standing challenge in narrative computational art: the challenge of balancing the ‘particular’⁹⁰⁰ potential for a functioning, systemic representation of personhood and its attendant dynamic agency, and the ‘resonances’ which lie at the heart of all representations of character, whatever their form.

In researching this specific issue, and developing practices to address it, I have derived a ‘generalizable convention’⁹⁰¹ that I call the ‘autocosmic’. Drawing on the tectonic shifts in narrative theory in recent

⁸⁹⁹ Nam, Hye Yeon and Nitsche, Michael ‘Interactive installations as performance: Inspiration for HCI’. *Proceedings of the 8th International Conference on Tangible, Embedded and Embodied Interaction*, 2014, pp. 189 – 196.

⁹⁰⁰ Keogh, Brendan, 2015.

⁹⁰¹ Koenitz, Hartmut, 2015.

decades as to 'the nexus of narrative and mind'⁹⁰², this convention deliberately considers the human narrative response as a spectrum of typically-related experiences that include both the aesthetic and non-aesthetic. An 'autocosmic' philosophy counsels artists to 'produce new ways of looking at things... [and] ways of framing the questions'⁹⁰³ that arise from the challenges of their practice. Specifically, it encourages those artists to look for new models for constructing their artworks, for courting an audience's 'resonant' reception, outside of any narrow prescriptions of their discipline; indeed, outside of the 'aesthetic' at all.

In Project `knole`, I used this philosophy to reconsider the question of computational characterisation. In conceiving it as a 'resonant', narrativist encounter between a human audience and a representation of *functioning* systemic personhood, I chose to move away from the exemplars of literature, film and other static modes to seek more appropriate models elsewhere. I found such models in the human relationship with place, space and environment across our species' history; a relationship that is often narrative, interactive, systemic and (para)social. This prompted me to re-frame the relationships between audiences and computational characters as somehow environmental, ecological and topographical themselves; to mitigate some of the issues of computational characterisation through the relatively 'resonant' modalities of virtual environment design. The 'character-as-environment' methodology, combines topographical, 'encyclopedic'⁹⁰⁴ interfaces with the dynamic agency that speaks to the potential of computational characters.

As my thesis has explored, this initial metaphor of 'character-as-environment' led me into several distinct practices for the construction of `knole`'s characters. I explored its ramifications through the construction and navigation of a character as a topographical and

⁹⁰² Herman, David 'The Nexus Of Narrative And Mind' In: Herman, David *Basic Elements Of Narrative*. London: Wiley, 2009.

⁹⁰³ Dennett, Daniel, 1987, p. 4.

⁹⁰⁴ Murray, Janet, 1997, p. 87.

ecosystemic space; through the use of paratexts and intertexts to contextualise and enhance those interactions; and through the ritualistic, space-oriented negotiation of these two modalities to fully explore the complexities of the characters, and the narrative beneath them.

As outlined in Chapter 1, whether these approaches have achieved a balance of ‘resonance’ and meaningful computational characterisation is a question of subjective degree. It is a question whose answer involves the interpenetrated judgements of myself as the artist and the work’s audience. While I did not have the opportunity to conduct extensive formal tests of *knole* during its development, visitors to test installations displayed a variety of complex, and overwhelmingly positive, responses; intellectual, physical, emotional, socially-oriented engagements through the modalities of environment design, prompted by the paratextual and intertextual material to participate in a ‘functioning... social world’⁹⁰⁵ with true cultural depth (see Appendix 1). What is more, it helped these visitors to question and enhance their understanding of the historical era in which the narrative was situated, ‘understand[ing] the ‘embedded’ meaning of local cultural activity based on [the] artifact’⁹⁰⁶.

The work provides a ‘hermeneutic rich[ness]’⁹⁰⁷ and character-led narrative ‘resonance’ by reframing some of the established principles of agent and environment design. The installation experience is one of complexity, empathetic interest, emotional engagement, corporeal activation, historical and contemporary context and interpersonal connection, parsed through a dynamic of topographical and ecosystemic interaction. I have used the systemic, interactive qualities of computation to stimulate, inform and entertain, drawing on my audience’s intrinsic historical knowledge, evolved interpersonal

⁹⁰⁵ Champion, Erik *Critical Gaming: Interactive History and Virtual Heritage*. London: Routledge, 2016.

⁹⁰⁶ Champion, Erik, 2003, p. 273.

⁹⁰⁷ Champion, Erik, 2015.

sensibilities, and a capacity for critical consideration and insight. My work has inspired pleasure and delight, sympathy and regret, play and experimentation, deep intellectual discussion and technical appreciation. While the most obvious credit for this goes to the live simulation of the ‘Beest’, the influence and ‘dynamic agency’ of Anne Latch is present in every aspect of the evoked narrative world; not merely as static assets within a simulatory environment, but as an active ‘presence’⁹⁰⁸ and ‘social authority’⁹⁰⁹ that continues to make its mark.

* * * * *

knole has been a successful and original approach to the problems of computational character, but there remain areas where I wish to undertake more work, both artistic and academic. As stated in the Introduction of this thesis, any methodology borne out of audience reception theory relies, to a certain extent, on empirical and practical evidence of that audience’s reception. My measures of knole’s success have been hampered by the simple fact that 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 throughout its development, my residency at the MWM has been the only major public outing of the project prior to completing my PhD (see Appendix 1). At this point in development, the *Housekeeping* was not fully complete, and so the visitors to the Museum had to rely on contextual labels alongside extensive samples of final *Housekeeping* content to frame their experiences with the simulation.

These limitations do not undermine my findings. I have had a good variety of audience feedback on a version of the work that was substantially developed, augmented by my own 'bottom-up... self-

⁹⁰⁸ Champion, Erik, 2007.

⁹⁰⁹ Champion, Erik, 2015.

examination⁹¹⁰ of the work throughout the entire development period. It is also important not to over-emphasise the necessity of extensive experimental study; Marie-Laure Ryan writes about the comparative value of both 'speculative' and 'experimental' work with interactive narratives⁹¹¹, and the comments of Mattie Brice on 'the death of the player' call into question over-reliance on audience feedback⁹¹².

Despite this, I am keen to further test my work through public displays in other venues and exhibitionary spaces, accompanied by evaluative surveys, questionnaires and other qualitative data capture techniques, to more fully support my theories and practice. Beyond general observations on the 'resonance' of the work, and the viability of my approach to computational character design, there are several outstanding investigations that I wish to pursue:

- 1) To what extent does a full or partial investigation of the *Housekeeping* before an audience's visit affect their appreciation of the systemic experience? How do different 'reading strategies' affect their 'trajectory' through the work⁹¹³⁹¹⁴?
- 2) Can the variety of 'player journeys'⁹¹⁵, and the exact nature of their oscillation between adherence to Anne's instructions and a freer exploration of the 'Beest's' more personified modalities, be successfully charted?

⁹¹⁰ Ryan, Marie-Laure 'My Narratology: An Interview with Marie-Laure Ryan'. *Diegesis* 3 (1), 2014 [Online]. Available at: <https://www.diegesis.uni-wuppertal.de/index.php/diegesis/article/view/148/191> [Accessed 19th June 2020]. R

⁹¹¹ Ryan, Marie-Laure, 'Narratology and Cognitive Science: A Problematic Relation'. *Style* 44 (4), 2010, pp. 469 – 495.

⁹¹² Brice, Mattie, 2015.

⁹¹³ Benford, Steve and Giannachi, Gabriella, 2011.

⁹¹⁴ Schroder, Kim Christian 'Audience reception'. In: Napoli, Philip (eds.) *Mediated Communication*. Boston: De Gruyter, 2018, pp. 105 – 128, p. 107.

⁹¹⁵ Kim, Amy Jo 'Gamification 101: Designing The Player Journey', Google Tech Talks, 2011 [Online]. Available at: <https://www.youtube.com/watch?v=BoH3ASbnZmc> [Accessed: 19th June 2020].

3) How do the unique pressures of the installation's context affect engagement; the 'cognitive loading'⁹¹⁶ required to engage with a complex systemic space⁹¹⁷, in combination with the 'pressure of time'⁹¹⁸, 'dynamically interrupting participants' and other specific limitations of a public installation? To what extent does prior engagement with the *Housekeeping*, in a private setting, ameliorate these problems? What modifications could be made to the installation space to ameliorate them further? How might 'character-as-environment' function in a version of *knole* that is released for private consumption on consumer devices?

4) Correspondingly, how does the relatively short dwell-time⁹¹⁹, and shallow engagement⁹²⁰ of the average visitor to an installation, affect the 'resonance' of a more-complex experience like that of *knole*? Can I instead begin to plot a wider variety of engagement levels, across a range of potential visitor demographics; from cursory, fleeting interactions to fully-engaged performances, perhaps over multiple visits that allow that audience member 'to engage and disengage with [it]... according to the circumstances of their everyday lives'⁹²¹? How does this relate to a conception of the 'resonance-in-aggregate' of the total audience, both engaged and unengaged, who through their asynchronous visits, and their palimpsest of interactions with the 'Beest', unwittingly take on the composite, asynchronous character of the entire 18th century public to whom Mr. Cryer addressed the *Housekeeping* (see Appendix 4)?

5) To what extent will different visitors engage with Anne's demands for physical, sympathetic performances with the Beest, realised through the mixed-reality dynamic of the work? To what extent is this mediated by shyness, self-consciousness and performance anxiety, and can such reluctances be mediated by creating a more sympathetic, supportive

⁹¹⁶ Champion, Erik and Dekker, Andrew 'Biofeedback and Virtual Environments'. *International Journal of Architectural Computing* 9 (4), 2011, pp. 377 – 395. h

⁹¹⁷ Mscat, Alexander, 2016.

⁹¹⁸ Champion, Erik, 2003.

⁹¹⁹ Marcault, Matheson, 2017.

⁹²⁰ Hornecker, Eva "I don't understand it either, but it is cool" - visitor interactions with a multi-touch table in a museum'. *2008 3rd IEEE International Workshop on Horizontal Interactive Human Computer Systems*, 2008, pp. 113 – 120.

⁹²¹ Benford, Steve and Giannachi, Gabriella, 2011, p. 93.

installation environment? Finally, how does a reticence to perform fully with the 'Beest' affect the work's 'resonance'? Does the performance of embodied actions enhance its affective and intellectual power?

6) How accessible and legible are the intricacies of the Beest's systemic simulation? Do they require improvement themselves at the programmable level, through redesign and refinement, or can they be better framed through the other elements of the total *knole* experience?

* * * * *

Beyond the immediate methodological and artistic concerns of *knole*, however, this project has opened intriguing avenues into my continuing professional and artistic practice. Beyond computational art most generally, Project *knole* (in its fiction and in some of its theoretical interests) has maintained a focus on narrative art in the context of historical and cultural interpretation. During the course of my PhD I have been building a professional practice as a 'narrative experience designer'⁹²² across the arts and in the cultural heritage sector, building on previous work as a resident artist in cultural institutions. As such, these concerns have cemented the work's historical context, its thematic foci, its 'resonant' benchmarks, and my choice of a museum - whose archives had heavily influenced the narrative - as a useful testbed. It has helped to produce a work that functions both as a work of art inserted into a historical/historiographical context - part of a canon that uses the 'museum as a site of activity' to produce 'self-reflexive exhibitions'⁹²³ and 'interventions'⁹²⁴ which 'play with... historical consciousness'⁹²⁵ - and as a work of 'interactive... historical character-based event representation'⁹²⁶, increasingly used in works of 'digital' or

⁹²² Sherman, Rob, *Bonfire Dog*, 2020 [Online]. Available at: <http://bonfiredog.co.uk> [Accessed: 20th June 2020].

⁹²³ Carbonell, Bettina Messias 'Part IV: Histories and Identities in the Museum'. In: Carbonell, Bettina Messias, 2012, p. 300.

⁹²⁴ Perry, Grayson *The Tomb of the Unknown Craftsman*. London: AVA, 2011.

⁹²⁵ Crane, Susan A., 2012, p. 308.

⁹²⁶ Magnenat-Thalman, Nadia and Papagiannakis, George 'Recreating Daily Life In Pompeii'. *Virtual Archaeology Review* 1 (2), 2010, pp.16 - 20, p. 16.

'virtual' heritage interpretation⁹²⁷ to 'convey not just the appearance but also the meaning and significance of cultural artefacts through the use of interactive and immersive digital media'⁹²⁸, in order to 'reveal deeper meaning and truth'⁹²⁹; to 'provoke and 'forge emotional and intellectual connections'⁹³⁰ between an audience and particular historical themes, concerns and experiences.

As my professional and artistic practice expands, I wish to pursue other experiments like *knole*: considering how the precepts of narrative design, and computational narrative art, can aid the task of interpreting historical sites and contexts – and how the blurred line between art and interpretation, provocation and education might be productively crossed, to the benefit of both activities. The completion of *knole* begs the question: how can both an 'autocosmic' mindset, and the use of computational narrative techniques, be used to 'spark... interest', 'broaden... horizons' and 'relate the subject to the lives of visitors'⁹³¹; in other words, to 'resonate' something of the complex of 'personal, social and cosmic environments'⁹³² of the past?

* * * * *

As part of such future work, I also want to further refine and explore these two concepts that I have created as part of this thesis: 'character-as-environment' more specifically, and the 'autocosmic' more generally. The ramifications of conceiving of persons as interpenetrated ecosystems, as redolent topographies – and using the computational paradigm to simulate and interactivise that conception – has many

⁹²⁷ Champion, Erik 'Defining Cultural Agents for Virtual Heritage Environments'. *Presence* 24 (5), 2015, pp.179 – 186.

⁹²⁸ Champion, Erik 'A 3D Pedagogical Heritage Tool Using Game Technology'. *Mediterranean Archaeology and Archaeometry* 16 (5), 2016, pp. 63 – 72, p. 64.

⁹²⁹ Beck, Larry and Cable, Ted T. *The Gifts Of Interpretation*. Illinois: Sagamore, 2011, pp. xxiii.

⁹³⁰ *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].

⁹³¹ Beck, Larry and Cable, Ted *Interpretation for the 21st Century: Fifteen Guiding principles for Interpreting Nature and Culture*. US: Sports, 2002.

⁹³² 'Histories From Within', *Inner Lives*, 2015 [Online]. Available at: <https://innerlives.org/about/> [Accessed: 20th June 2020]. 1b

intriguing applications; works of narrative comp-art where this functional metaphor is applied to other character-led scenarios. It could be particularly applicable to cultural heritage contexts, where simulations of historic architecture, devoid of its previous inhabitants, often struggles to relay the significances of the complex cultures that lived within them.

In the realms of artistic expression and entertainment where most consumer videogames reside, I feel that this methodology not only has more to offer in the pursuit of ‘resonant’ computational characterisation; it can also be used to improve environment design in and of itself. While I have drawn on the relative sophistication of virtual environment design to inform my own methodologies, it remains the case that many game worlds remain ‘visually rich but information poor’⁹³³, ‘non-interactive vessel[s] for some other form of gameplay’⁹³⁴. Despite increasing attempts at ecosystemic complexity, design patterns still encourage the production of what Bogost calls ‘Potemkin villages’⁹³⁵ lacking true immersive quality or ‘cultural presence’⁹³⁶. As with characters, the ‘formality gap’⁹³⁷ between the richness of environmental engagement across human culture and the often transactive, reductively strategic occupation of space in comp-art needs to be addressed. Designers of computational characters and spaces alike may find much of use in an ‘autocosmic’ reconsideration of how, and why, spaces ‘resonate’ with their occupants and audiences. This might involve stepping beyond the ‘immutable received wisdom’⁹³⁸ of architectural theory and theme park design⁹³⁹⁹⁴⁰ that often characterises

⁹³³ Youngblood, G. Michael *et al.* ‘Embedding Information into Game Worlds to Improve Interactive Intelligence’. In: Gonzalez-Calero, Pedro Antonio and Gomez-Martó, Marco Antonio (eds.) *Artificial Intelligence for Computer Games*. London: Springer, 2011, pp. 31 – 53.

⁹³⁴ Berry, Noah, 2015.

⁹³⁵ Bogost, Ian, 2015.

⁹³⁶ Champion, Erik, 2007.

⁹³⁷ Dix, Alan *et al.* 2004, p. 232.

⁹³⁸ Dias, Bruno, 2016.

⁹³⁹ Brouchoud, Jon ‘The Importance of Architecture in Video Games and Virtual Worlds’, *Arch Virtual*, 2013 [Online]. Available at: <https://archvirtual.com/2013/02/09/the-importance-of-architecture-in-video-games-and-virtual-worlds/> [Accessed: 20th June, 2020].

⁹⁴⁰ Carson, Don ‘Environmental Storytelling: Creating Immersive 3D Worlds Using Lessons Learned from the Theme Park industry’, *Gamasutra*, 2000 [Online]. Available at: http://www.primitive-eye.com/pdf_files/Environmental_storytelling_pt1.pdf [Accessed: 20th June 2020].

interdisciplinary inspiration in this field, towards other, surprising avenues of enquiry.

Project `knole` was a natural result of my own investigations into this wider clutch of fields – from post-humanism, robotics and systems biology, to the 'new cybernetics'⁹⁴¹, nature writing and econarratology. While I am certainly interested in how the 'character-as-environment' methodology can be used to explore the traditional human-level intercourses of narrative fiction in any media, these ideas may find their greatest application in narratives that 'unsettle the metaphysical primacy of the human'⁹⁴², and instead consider the significance of the 'overtly other'⁹⁴³.

In Chapter 1, I referenced Ian Bogost's argument that post-humanist and 'flat' ontologies⁹⁴⁴ show that 'videogames are better without characters' or stories⁹⁴⁵⁹⁴⁶; that instead they should provide artistic representations of 'systems larger than ourselves' where 'processes predominate', rather than any semblance of a human-scale narrative⁹⁴⁷.

In many ways, I share Bogost's desire for realising the systemic potentials of computational art. However, I do not believe that this means discarding the traditional concepts of narrative and character altogether. I want to explore how the 'character-as-environment' methodology, arising out of the same post-humanist discourses as Bogost's own, can explore an alternative conception of 'human protagonists, psychological causality, and human-scale temporality and spatiality' of narratives without necessarily 'foreground[ing]' them⁹⁴⁸.

⁹⁴¹ Heylighen, Francis *et al.* (eds.) *Self-Steering and Cognition in Complex Systems: Toward a New Cybernetics*. New York: Gordon and Breach, 1990.

⁹⁴² Ibid.

⁹⁴³ Sandry, Eleanor 'The Potential of Otherness in Robotic Art' *In*: Herath, Damien *et al.* (eds.), 2016, pp. 177 – 189.

⁹⁴⁴ Bogost, Ian, 2012.

⁹⁴⁵ Bogost, Ian, 2015.

⁹⁴⁶ Bogost, Ian, 2017.

⁹⁴⁷ Bogost, Ian, *Story vs. System*, Critical Path, 2016 [Online]. Available at: <https://www.criticalpathproject.com/video/story-vs-system/> [Accessed: 20th June 2020]. c

⁹⁴⁸ Caracciolo, Marco, 2018.

While Bogost believes they have no place in comp-art, I believe they need a systemic reintegration.

Based upon my autocosmic research (see Chapter 2), it is evident that the deep, evolved narrative tendencies of human audience will always privilege the tenets that Bogost so dismisses. Changing the focus of narrative entirely to larger, more abstract systems – even if they contain or involve human activity – may have more use as a philosophical exercise than a method for producing ‘resonant’ works of art.

There is real potential in attempting to ‘extricate character from anthropomorphic conceptions’⁹⁴⁹ through systemic means - to repunctualise the protagonist, the character, the *person*, not as a ‘sovereign, autonomous entit[y]’⁹⁵⁰ that is incontrovertible and separable, but as part of an interpenetrated array of significant systems that contain complementary intentionalities and agencies; ideas that have an established place in fiction, and indeed are starting to make inroads into comp-art itself. In exploring ideas such as symbiogenesis⁹⁵¹, actor-network theory⁹⁵², distributed cognition⁹⁵³ and morphogenesis⁹⁵⁴, new ways of approaching the same narrative concerns will reveal themselves, rather than requiring their disposal. In my own work, whether in my art or in the practice of interpreting heritage, I would like to not just consider systems ‘larger than ourselves’⁹⁵⁵; but precisely as large, and as complex, as we are.

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⁹⁴⁹ Caracciolo, Marco, 2018.

⁹⁵⁰ Nayar, Pramod, 2014, p. 43.

⁹⁵¹ Margulis, Lynn ‘Symbiogenesis and Symbioticism’. In: Margulis, Lynn and Fester, Rene (eds.) *Symbiosis as a Source of Evolutionary Innovation: Speciation and Morphogenesis*. Massachusetts: The MIT Press, 1991, p. 1. M

⁹⁵² Latour, Bruno ‘On actor-network theory: A few clarifications’. *Soziale Welt* 47 (4), 1996, pp. 369 – 381.

⁹⁵³ Cole, Michael and Engestrom, Yrjo ‘A cultural-historical approach to distributed cognition’. In: Salomon, Gavriel (eds.) *Distributed Cognitions: Psychological and Educational Considerations*. Cambridge: CUP, 2001, p. 1.

⁹⁵⁴ Hofstadter, Douglas, 2000, p. 45

⁹⁵⁵ Bogost, Ian, 2015.

Of course, ‘character-as-environment’ is only one particular instance of the broader ‘autocosmic’ philosophy. Even before the ‘character-as-environment’ method arose in my study, I was developing my conception of the ‘autocosmic’ in tandem with my work on *knole*. It has been an energising experience, helping me to develop a much deeper and more holistic 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. The theory itself could bear further refinement, in order to manage any interdisciplinary miscommunications (particularly between the arts and the sciences), to reconsider my tendency to focus on Western discourses, and to further bolster the model of narrative response upon which it relies.

However, in its current state as a personal design philosophy, ‘boundary object’⁹⁵⁶ and functional metaphor, it does not strive for completionist rigour; but rather stands as a fusion of academic consideration and artistic provocation. It is designed to galvanise new action in the ‘pragmatics’ of narrative⁹⁵⁷, rather than to fully determine its theoretical nature. As such, as a creative impulse there are many routes it might take.

Narrative computational art, containing examples of what Koenitz calls the current ‘narrative avant-garde’⁹⁵⁸, is an excellent outlet for such ‘structural innovations’ as the ‘autocosmic’ provides⁹⁵⁹. However, it is a concept that has application beyond these modal boundaries. Every field, mode and medium of artistic practice – of craft most generally – has its developmental challenges that could be re-framed or reconsidered through the ‘autocosmic’: a framework that asks for

⁹⁵⁶ Benford, Steve and Giannachi, Gabriella, 2012.

⁹⁵⁷ Ryan, Marie-Laure ‘Semantics, Pragmatics and Narrativity: A Response to David Rudrum’. *Narrative* 14 (2), 2006, pp. 188 – 196.

⁹⁵⁸ Koenitz, Hartmut ‘Beyond “Walking Simulators”: Games as the Narrative Avant-Garde’. *Proceedings of DiGRA 2017*, 2017 [Online]. Available at: http://digra2017.com/static/Extended%20Abstracts/149_DIGRA2017_Koenitz_Walking_Simulators.pdf [Accessed: 20th June 2020].

⁹⁵⁹ Murray, Janet, 2018.

reconsideration not only of the subject of narrative work, or its metaphorical significance, but the concrete mechanics of its construction and reception. Backed by extensive and continuing research, this reconsideration opens the vaster realms of human imaginative engagement to artists of every stripe.

Appendix 1

Fieldwork Report #1: Pilot Study of Project *kn01e* 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 test version of the installation, and the *Housekeeping*, to the museum's visitors. I 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'⁹⁶⁰ or self-oriented 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 *kn01e* itself. The MWM has several permanent displays on cunning folk, familiar spirits and the rituals of popular magic, 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 installation, in its prototype form, was set up in the Library space above the museum proper⁹⁶¹. 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

⁹⁶⁰ DeMaria Jr., Robert 'The Ideal Reader: A Critical Fiction'. *PMLA* 93 (3), 1978, pp. 463-474.

⁹⁶¹ See Appendix #9, Figure 13e.

props. The *Housekeeping* was not at that point sufficiently developed (nor were its ritual components sufficiently integrated into the simulation's codebase) to provide a full 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 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 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. 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 installation dominated the room (which could fit roughly 5 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 installation 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 its personality?
- How did you feel towards the character?
- How did it relate to what you experienced in the museum itself?

Over three days, the installation attracted roughly 80 visitors. Approximately 5% of these were self-identified magical practitioners or followers of pagan religions, 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 towards 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 creature '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 (see Chapter 2). 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 'Beest', 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.

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'⁹⁶²; and another reporting that the entire installation made him 'want to dive right in' to Anne Latch's world. Many people stopped on the threshold of the installation when they saw the creature; 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 creature, 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 creature's 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',

⁹⁶² See Appendix #9, Figure 13u.

'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 creature, a variety of approaches, techniques and self-narrations were in evidence⁹⁶³. When reading in the supplementary materials that the 'Beest' 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 'Beest'⁹⁶⁴; 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 creature for nearly ten minutes, eyes shut and legs crossed, matching his breathing to the simulated creature's own, slow breaths⁹⁶⁵. When they left, many visitors would say goodbye to the simulation, and even (half-jokingly) admonish their partners for not doing so themselves. One woman, who saw the 'Beest' move forward on the screen when she went to leave, remarked with evident delight that, because they had treated the simulation kindly, 'he [was] try[ing] to follow'⁹⁶⁶.

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 'Beest's' horns or ears as part of the same ritual process; especially when observing the corresponding emotional change on

⁹⁶³ See Appendix #9, Figures 13a – 13w.

⁹⁶⁴ See Appendix #9, Figure 13d.

⁹⁶⁵ See Appendix #9, Figure 13m.

⁹⁶⁶ See Appendix #9, Figure 13b.

screen. Several (both adults and children) verbally apologised to the creature 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 creature 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 'Beest' to command it to 'begone' and 'return', and laughed with surprise and disgust when hurting or disfiguring the 'Beest'.

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 simulation reminded them of those traditions. Those visitors who had a background in computer programming were eager to comment upon and learn more about the codebase behind the simulation, 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 small way to resolving⁹⁶⁷.

The MWM residency stands as an illustration-in-action of some 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

⁹⁶⁷ See Appendix #9, Figure 13w.

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' in a public exhibition that was the main deterrent⁹⁶⁸. 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 literature⁹⁶⁹⁹⁷⁰. 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'⁹⁷¹; particularly experiences like *knole* 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'⁹⁷². Other, more mundane issues of accessibility arose, always of concern in art galleries and museums, 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. Finally, there are questions about how my physical presence during the residency (a necessary evil due to technological issues and the evaluative objectives of the exercise) may have influenced audience response. This

⁹⁶⁸ Spence, Jocelyn, 2016.

⁹⁶⁹ Scott, Susie *et al.* 'Goffman in the Gallery: Interactive Art and Visitor Shyness'. *Symbolic Interaction* 36 (4), 2013, pp.417 – 438.

⁹⁷⁰ Scott, Susie. 'Shyness in interactive art galleries and museums: a symbolic interactionist account'. Nordic Sociological Association (NSA) Annual Conference, Oslo, Norway, 2011.

⁹⁷¹ Parry, Ross, 2013, p. 260

⁹⁷² 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].

is a perennial topic in many branches of art, particularly performance art, but in my work my presence was an artificiality that does not represent the designed 'typical' experience of the installation, whether for examination or future display.

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 Appendix 5, and 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 complete *Housekeeping* both prior to or during this prototype installation. This unavailability meant that some 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; some of the features of the Project thus 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 'Beest' more extensively, and derived more 'resonance' than casual visitors. While this gives me confidence that this dynamic between *knole*'s components works well with audiences when fully implemented, it will be 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 specifically, and the semantic value of individual visitor experiences in aggregate during a persistent

installation (see Appendix 4 and Conclusion). 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 thesis, 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 'Beest' was treated as a complex and coherent person; experienced as a characterful and arresting system both emotionally and intellectually, which 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. 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 literature⁹⁷³, and seemed to also fulfill Tilden's classic definition of the 'provocation'⁹⁷⁴ 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. These themes included digital narrative and character, the nature of witchcraft and belief in the past and today,

⁹⁷³ Falk, John 'The use of time as a measure of visitor behaviour and exhibit effectiveness'. *Roundtable Reports* 7 (4), 1982, pp. 10 – 13.

⁹⁷⁴ Tilden, Freeman, 1957.

cunning folk and the history of magical practice, the nature of control and power in magic, and the emotional and '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. 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 accommodate 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; observe the intuitiveness of the touch interface; think through how to instruct visitors in stance and posture during interaction; and devise technical solutions to the software bugs, performance and responsiveness issues and unhelpful affordances that inevitably arise during software development and artistic practice more generally.

Appendix 2

Fieldwork #2: Observation Of Character-Reader Relationships Within A Reading Group

The theory of audience reception (which forms a key part 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. 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 exist⁹⁷⁵, I wanted to cement my co-option of the existing literature with a small piece of my own primary research, particularly as my research is concerned directly with the measure of a work's 'resonance' with its audience. 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, through observation, to help 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.⁹⁷⁶ However, Platonic ideals aside, it is difficult to conceive of a character that is not mediated in some way: I therefore chose the fictional characters of novels, and their readers, as my subjects. Given the form's ubiquity and central 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 reading group in the city of Derby in England; attending four meetings, one per month. The group membership was entirely female, and discussed a range of contemporary novels from Murakami's *Kafka on the Shore*⁹⁷⁷ to

⁹⁷⁵ Holland, Norman N *The Nature Of Literary Response: 5 Readers Reading*. London: Transaction, 1975.

⁹⁷⁶ Keogh, Brendan, 2015.

⁹⁷⁷ Murakami, Haruki *Kafka on the Shore*. London: Vintage, 2005.

Rose Tremain's *The Road Home*⁹⁷⁸. 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 how they judged their mimetic and metaleptical qualities. In particular, I was interested in how the members' 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. 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 the discussion of characters from other works whom they disliked as narrative constructions: that is, characters who lacked 'resonance'.

In this group I found, as studies before mine confirm, a 'profound... meeting of minds'⁹⁷⁹ between readers and characters; 'troubled creatures' distinct and interrogable, as one group member called them. The participants may have begun their discussions in terms of the character's 'determined context'⁹⁸⁰ 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'⁹⁸¹. Their discussion of Tremain's *The Road Home* took the Eastern European protagonist and placed him into

⁹⁷⁸ Tremain, Rose, 2009.

⁹⁷⁹ 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.

⁹⁸⁰ Bradbury, Malcolm 'Character'. In: Childs, Peter and Fowler, Roger *The Routledge Dictionary Of Literary Terms*. London: Routledge, 2006, p.24.

⁹⁸¹ Keen, Suzanne, 2011, p. 299.

alternate narratives, situations 'separate... from [their] surrounding fictional determinants'⁹⁸². 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, the pleasures of experiencing narrative art was the concretisation of the individual, interrogable persons who lay at their centres: each an 'entire self'⁹⁸³ who, through what Lewis calls 'perdurance'⁹⁸⁴, can be distinguished and discussed as 'itinerant individuals'⁹⁸⁵ above and beyond their 'text'.

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 receive, 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 distinct qualities of more static art-forms, which became an important point of comparison for this thesis.

⁹⁸² Bradbury, Malcolm, 2006, p.24

⁹⁸³ Gibson, Walker 'Authors, Speakers, Readers, and Mock Readers'. *College English* 11, 1950, pp. 265 -269.

⁹⁸⁴ Lewis, David Kellogg *Counterfactuals*. Harvard: Harvard University Press, 1986.

⁹⁸⁵ Margolin, Uri 'Individuals In Narrative Worlds: An Ontological Perspective'. *Poetics Today* 11 (4), 1990, pp. 843 – 871, p. 864.

Appendix 3

Fieldwork Report #3: Supervised, Self-Narrated Interaction With Computational Characters

While audience reception theory has been explicitly paralleled within computational art, in particular within game studies⁹⁸⁶⁹⁸⁷, critical observations of 'real' audiences undertaken within such a framework remain rare. As a point of comparison to my reading group study outlined in Appendix 2, 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 gamers 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 hours⁹⁸⁸. 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*⁹⁸⁹, minimalist platformer

⁹⁸⁶ Sanders, April *Parallels Between The Gaming Experience and Rosenblatt's Reader Response Theory*. Ph. D thesis. The University of North Texas, 2013.

⁹⁸⁷ Sanders, April 'Understanding The Video Game Experience Through Reader Response Theory'. *Read 2* (3). 2016, pp. 45-63.

⁹⁸⁸ See Appendix 9, Figure 1.

⁹⁸⁹ Bethesda Game Studios, 2011.

*Thomas Was Alone*⁹⁹⁰, the narrative adventure game *Shelter*⁹⁹¹ and the 'walking simulator'⁹⁹² *Everybody's Gone To The Rapture*⁹⁹³.

While the participants were playing the game, I asked them to self-narrate their experience: a well-established technique in commercial videogames testing⁹⁹⁴. I sat beside and slightly behind the participant during their play session, taking notes both on my observation of their 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 questionnaire⁹⁹⁵ 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'^{996/997}.

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 comp-art.⁹⁹⁸ 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. This was a vital component of my own development of a 'resonant' computational character, similarly designed for the reception of 'real' audiences.

⁹⁹⁰ Bithell, Mike, 2012.

⁹⁹¹ Might And Delight *Shelter* [PC Software] US: Might And Delight, 2013.

⁹⁹² 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.

⁹⁹³ The Chinese Room *Everybody's Gone To The Rapture*. UK: Sony, 2015.

⁹⁹⁴ 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.

⁹⁹⁵ See Appendix 9, Figure 14.

⁹⁹⁶ Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions'. p. 3.

⁹⁹⁷ See Appendix #9, Figure 14.

⁹⁹⁸ Keogh, Brendan, 2015.

Appendix 4

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]⁹⁹⁹ 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'¹⁰⁰⁰ control, and who do not 'function... as a focus for... [the player's] agency'¹⁰⁰¹ or as a 'digital prosthesis'¹⁰⁰². Videogames provide the clearest definition of this distinction: between NPCs or 'non-player characters'¹⁰⁰³, 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. 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, empathetic identification, 'experience-taking'¹⁰⁰⁴ and the 'meeting of minds'¹⁰⁰⁵ which form one of the 'basic psychological process[es]'¹⁰⁰⁶ of engaging with fictional characters. However, a complication in this relationship arises from the fact that such characters are not merely observed and

⁹⁹⁹ Banks, Jaime *et al.* *100 Greatest Video Game Characters*. Maryland: Rowman & Littlefield, 2017, pp. 47.

¹⁰⁰⁰ Salen, Katie and Zimmerman, Eric. *Rules Of Play: Game Design Fundamentals*. Cambridge: MIT Press, 2004, p.60.

¹⁰⁰¹ Liboriussen, Bjarke *The Mechanics of Place: Landscape and Architecture in Virtual Worlds*. Ph.D. thesis, University of Southern Denmark, 2009, p.45.

¹⁰⁰² Papale, Luca 'Beyond Identification: Defining The Relationships Between Player And Avatar'. *Journal Of Games Criticism* 1(2). 2014, pp. 1-12.

¹⁰⁰³ Tronstad, Ragnhild 'NPC (Nonplayer Character)'. In: *The John Hopkins Guide To Digital Media*. Baltimore: John Hopkins University Press, 2014 p.

¹⁰⁰⁴ Kaufman, Geoff and Libby, Lisa 'Changing Beliefs and Behavior Through Experience-Taking'. *Journal of Personality and Social Psychology*. 2012, p. 1.

¹⁰⁰⁵ Oatley, Keith 'Meeting of minds: Dialogue, sympathy and identification, in reading fiction'. *Poetics* 26 (1), 1999, pp. 1.

¹⁰⁰⁶ Bley, Edgar S 'Identification: 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 (real and unreal) people, or even merely interacted *with* in computational art, but are materially and directly controlled by the audience themselves as an 'epistemic and behavioural proxy'.¹⁰⁰⁷ 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 3). Some games, such as *Skyrim*¹⁰⁰⁸, 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*¹⁰⁰⁹, present the player with an individual character already authored, set within a particular circumstance and wedded to a very specific sort of expressive control. Others, such as *Thomas Was Alone*¹⁰¹⁰, maintains an ambiguity between NPC and PC, allowing the player to switch at will between several, well-defined characters who maintain relationships with each other, made explicit by the narration. The question of who the 'player character' is, in this scenario, remains productively 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'¹⁰¹¹ pre-existing characterisations as their own identity, or preserve an 'alterity'¹⁰¹² which allows that audience to conduct parasocial or social relationships with the PC as they take on their perspective. Some chart the audience's ability (or necessity) to 'introject'¹⁰¹³,

¹⁰⁰⁷ Tavinor, Grant, 2007, p.84.

¹⁰⁰⁸ Bethesda Softworks, 2011.

¹⁰⁰⁹ Might And Delight, 2013.

¹⁰¹⁰ Bithell, Mike, 2012.

¹⁰¹¹ 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.

¹⁰¹² 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].

¹⁰¹³ Van Looy, Jan. *Understanding Computer Game Culture: The Cultural Shaping Of A New Medium*. Saarbrücken: Lambert Academic Publishing, 2010, p .117.

'emplace'¹⁰¹⁴ or 'self-insert'¹⁰¹⁵, treating the characters-as-represented as objects, tools or 'vehicular embodiment[s]'¹⁰¹⁶ for their own self-determined characterisations. I certainly observed this range of autocosmic responses within my study group (see Appendix 3). 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'¹⁰¹⁷, the perspective that the interacting audience takes affects almost every other part of the experience, including the 'resonance' of non-player characters. 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 audience's own bodies, postures, interactions and performances, facilitated by the natural interfaces of the work. As in many mixed-reality works, I designed for direct engagement with the 'Beest', with no explicit 'avatar bias'¹⁰¹⁸ and an almost-complete 'motor convergence'¹⁰¹⁹ between audience and 'player character'. I did this for several reasons. Primarily, this design served to reduce the distance between the audience and the 'Beest'; allowing them to co-exist as characters within an ambiguously-delineated storyworld, and for the work to experiment with intimacy, direct manipulation and other

¹⁰¹⁴ Morie, Jacquelyn Ford 'Performing in (virtual) spaces: Embodiment and being in virtual environments'. *International Journal of Performance Arts and Digital Media* 3: 2-3 (2007), pp.123 – 138, p. 127.

¹⁰¹⁵ 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].

¹⁰¹⁶ Newman, James, 2002.

¹⁰¹⁷ Lankoski, Petri 'Player Character Engagement In Computer Games'. *Games And Culture* 6 (4), 2011, pp. 291-311, p. 292.

¹⁰¹⁸ Seraphine, Frederic 2016.

¹⁰¹⁹ Gregerson, A.L. and Grodal, T 'Embodiment and Interface'. In: *The Video Game Theory Reader 2*. London: Routledge, 2009.

mixed-reality concepts as facilitators of 'resonance'. The design also served to focus attention on the 'Beest', rather than splitting audience investment between the simulation and some 'present' protagonist (besides the preterite presence of Anne) whom the visitor would almost certainly prioritise (see Chapter 1.2).

While the characterisation I do provide is certainly subject to what Harvey Smith calls the 'Imago Effect'¹⁰²⁰, guiding the context of the visitor and encouraging certain behaviours and interactions with the 'Beest', I did not want to constrict or pre-define the audience's autocosmic engagement more than was necessary or appropriate within the fiction. This was particularly important because, as my installation at the Museum of Witchcraft and Magic demonstrated (see Appendix 1), audiences can be intimidated by the demands of interaction and performance within an installation space; something which, it may be theorised, specific roleplaying requirements might exacerbate.

Instead, the light-touch characterisation of the visitor, and the possibility for what de Wildt and Aupers call 'self-chosen identification'¹⁰²¹, opened up several, non-prescriptive interpretations of their narrative 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, supposedly bored of her cosseted existence, and to whom Anne bequeaths her entire estate. 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 audience/reader: characterising the young 'Miss' as more accustomed to the comforts that twenty-first century life now affords (constant diversion, warm housing and exotic food) than the

¹⁰²⁰ Smith, Harvey. *The Imago Effect: Avatar Psychology*. Game Developer's Conference, San Francisco, March 5th 2007.

¹⁰²¹ De Wildt, Lars and Aupers, Stef. 'Playing the Other: Role-playing religion in videogames'. *European Journal of Cultural Studies* 22: 5-6 (August 2018), pp. 867 – 884, p. 878.

impoverishments that Anne's working-class contemporaries are forced to endure; conditions which Anne herself seeks to escape.

The written 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 'Beest', and the estate, for themselves. The cumulative effect of multiple visitors upon the 'Beest's' body and psychology (see Chapter 3 and Conclusion), 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.

While questions persist as to whether 'anyone entering into a virtual world [is not] playing a role'¹⁰²², 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 work through lenses of gender, labour relations, social relations and others.

Whichever role is adopted, the simulated creature 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 'Beest' for two years, Anne's relationship and presence has come to define, and

¹⁰²² Morie, Jacquelyn Ford, 2007, p. 131.

structure, its entire existence (see Chapter 3.7). Mechanically, then, it may be Anne herself who the visitor is perhaps most invited to identify with, or against; and her role and presence which they are most encouraged to adopt or deny.

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 PC design, the many complications of the task – between characterisation and instrumentality, between what Calleja calls the 'entity' and the 'self'¹⁰²³, and the potential for dissonance between player and character - may require a different direction for the researcher or artist, and different examples and inspiration from beyond the narrowly aesthetic upon which to draw. Such 'non-actual persons'¹⁰²⁴ lie along a more complicated, yet equally fruitful, line of enquiry than my own.

¹⁰²³ Calleja, Gordon, p. 124.

¹⁰²⁴ Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions'. p. 3.

Appendix 5

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 work of digital installation art. This is a well-defined area of study and practice in its own right, 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 corollary, game studies. This is despite the fact that, at first glance, *knole* has little in common with the 'classic' 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* narrative comp-art becomes apparent. In a detail which perhaps mirrors the wider trend toward 'post-classical'¹⁰²⁵, 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 discourse¹⁰²⁶, focussing on ludological 'artificial conflicts', skill-based competitions and

¹⁰²⁵ Mani, Inderjeet, 2013.

¹⁰²⁶ Keogh, Brendan 'Across Worlds And Bodies: Criticism In The Age Of Video Games'. *Journal Of Games Criticism* 1 (1), 2014, p.1.

'quantifiable outcomes'¹⁰²⁷ (often, as Chapter 1 outlines, arguing against the role of narrative in games altogether), to a greater pluralism which concentrates on a more multidimensional consideration of the form; encompassing affective, phenomenological, social and narrative elements united only, at the most base level, by the computational mode, a 'system... defined by rules'¹⁰²⁸. The 'game/not game'¹⁰²⁹ 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'¹⁰³⁰ of the paradigm: particularly when it comes to confronting issues of narrative, using unusual input/output media, or employing novel models of interaction.

Now the economic, social, cultural, methodological and philosophical bounds of videogames parlay with 'not-games'¹⁰³¹, 'playable stories'¹⁰³², virtual, mixed and augmented reality experiences, installation works, interactive fiction such as Twine Stories, avant-garde works, academic outputs, 'art-games' and 'critical games'¹⁰³³, 'interactive experiences'¹⁰³⁴ and 'strange... unstable... hybrids between games and narratives'¹⁰³⁵ of all stripes, most of which 'cannot be easily folded into the field of games in general'¹⁰³⁶. There continues to be much discussion about the 'conceptual baggage'¹⁰³⁷ of the term 'game' in the culture, particularly as it bleeds into surrounding discourses of comp-art: terms

¹⁰²⁷ Salen, Katie and Zimmerman, Eric, 2004, p. 81.

¹⁰²⁸ Salen, Katie and Zimmerman, Eric, 2004, p. 80.

¹⁰²⁹ Kopas, Merritt ed. *Videogames For Humans.: Twine Authors In Conversation*. US: Instar Books, 2014.

¹⁰³⁰ Salen, Katie and Zimmerman, Eric, 2004.

¹⁰³¹ Samyn, Michel *Not a manifesto*, 2010 [Online]. Available at: <http://notgames.org/blog/2010/03/19/not-a-manifesto/> [Accessed 18th August 2018].

¹⁰³² Wood, Hannah, 2017.

¹⁰³³ Flanagan, Mary, 2009.

¹⁰³⁴ 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].

¹⁰³⁵ 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].

¹⁰³⁶ Calleja, Gordon, 2011, p. 183.

¹⁰³⁷ Veale, Kevin "'Interactive Cinema Is an Oxymoron, but May Not Always Be'. *Game Studies* 12 (1), 2012.

such as 'virtual interactive media'¹⁰³⁸ and 'interactive digital narrative'¹⁰³⁹, have been proposed, while others see the term 'game' as a necessary shibboleth for talking about a wider, and ultimately untriangulated, landscape of works.

Correspondingly, other forms of 'digital art', 'new media' and 'comp-art' have borrowed from the videogame canon and blurred the boundaries even further; particularly when narrative objectives are invoked. 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 practice¹⁰⁴⁰: an emblem of a particular fusion of systemic procedurality, human-computer interaction and expressive, narrative meaning-making¹⁰⁴¹. For Riedl, similarly, it is 'the largest class of commercial product through which the public regularly comes into contact with artificial intelligence' (as embodied virtual agents within narrative scenarios)¹⁰⁴², and for Champion, the form's 'massive influence on culture' make it impossible to segregate from the rest of the comp-art landscape¹⁰⁴³. Consequently, discourses as diverse as human-computer interaction, narratology, artificial intelligence, and heritage interpretation have all drawn from the videogames discourse to advance their own resonant practice. Of particular interest is the osmosis between digital installation art and videogames, with many artists such as Lawrence Lek¹⁰⁴⁴, Jeremy Couillard¹⁰⁴⁵ and Ian Cheng¹⁰⁴⁶ combining videogame technologies and narrative techniques with the participatory,

¹⁰³⁸ Mol, Angus *et al.* *The Interactive Past: Archaeology, Heritage and Video Games*. Leiden: Sidestone Press, 2017, p. 7.

¹⁰³⁹ Koenitz, Hartmut, 2015.

¹⁰⁴⁰ Ryan, Marie-Laure, 2009.

¹⁰⁴¹ Newman, James, 2002.

¹⁰⁴² Riedl, Mark O. 'Interactive Narrative: A Novel Application of Artificial Intelligence for Computer Games', *Proceedings of AAAI 2012*, 2012 [Online]. Available at: <https://www.cc.gatech.edu/~riedl/pubs/aaai12.pdf> [Accessed: 19th December 2019].

¹⁰⁴³ Champion, Erik 'Applying game design theory to virtual heritage environments'. *Proceedings of the 1st international Conference on Computer Graphics and Interactive Techniques in Australasia and South East Asia* (2003), pp. 273 – 274.

¹⁰⁴⁴ Lek, Lawrence *Bonus Levels*, undated [Online]. Available at: <http://bonuslevels.net/> [Accessed: 8th August 2018].

¹⁰⁴⁵ Couillard, Jeremy *jeremy c*, 2018 [Online]. Available at: <http://www.jeremycouillard.com/> [Accessed: 8th August 2018].

¹⁰⁴⁶ Cheng, Ian, 2018.

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 design approach, 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 1 are not only evident, but actively tackled. Videogames remain the 'current apotheosis of high-level human-computer interaction'¹⁰⁴⁷, 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'¹⁰⁴⁸: concerns that have their roots, ultimately, in computation.

¹⁰⁴⁷ Newman, James. 'In search of the videogame player'. *New Media And Society* 4 (3), 2002, pp.405-422, p. 405.

¹⁰⁴⁸ Montfort, Nick 'Foreword'. *In: Koenitz, Harmut et al. (eds.), 2015, pp. ix – xiv, p. x*

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'¹⁰⁴⁹ 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'¹⁰⁵⁰ model provided by the fantasy roleplaying game *The Elder Scrolls V: Skyrim*.¹⁰⁵¹ Not only was this a videogame that had served as a research focus for my participant study (see Appendix 3), it was the latest iteration of a franchise that has 'for decades... refin[ed] the same open world formula'¹⁰⁵², critically acclaimed for its 'glimpse[s] into another world'¹⁰⁵³; designed computational spaces with which the player can interact through 'naturally paced, non-linear play and explorative [sic] flow'¹⁰⁵⁴. Despite being ten years old, it is still held up as one of the best examples of 'a rich and varied landscape'¹⁰⁵⁵ 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 sciences¹⁰⁵⁶ and game studies¹⁰⁵⁷. They provide the 'methodological and methodical

¹⁰⁴⁹ Burgess, Robert *In The Field: An Introduction To Field Research*. Hemel Hempstead: George Allen and Unwin, 1984, p. 1.

¹⁰⁵⁰ 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].

¹⁰⁵¹ Bethesda Softworks, 2011.

¹⁰⁵² *The best open world games | PC Gamer*, 2018 [Online]. Available at: <https://www.pcgamer.com/best-open-world-games/> [Accessed 8th August 2018].

¹⁰⁵³ Ibid.

¹⁰⁵⁴ Berry, Noah 2015.

¹⁰⁵⁵ 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].

¹⁰⁵⁶ Taylor, Rex N *Virtual Fieldwork Project* [Online]. Available at: <http://visualisation.soton.ac.uk/> [Accessed 8th August 2018].

¹⁰⁵⁷ Watrall, Ethan 'Digital Games as Public Archaeology', *playthepast*, 2011 [Online]. Available at: <https://www.playthepast.org/?p=938> [Accessed: 19th December 2019].

groundwork¹⁰⁵⁸ for studies into player engagement¹⁰⁵⁹, archaeological practice¹⁰⁶⁰, and the dynamics of online communities¹⁰⁶¹. The *Elder Scrolls* 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 presence¹⁰⁶², conduct geographical analysis¹⁰⁶³ and forward demographic theories¹⁰⁶⁴. 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’ characterisation in such environments, and use this data as a template for my own autocosmic design philosophy: creating a character through the tenets of environment design, such as those employed in *Skyrim*, in order to capitalise on those environments’ ‘resonant’ cultural affordances.

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. 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, so-called ‘vanilla’ design. This is especially relevant considering the popularity and range of modifications which directly change or improve the

¹⁰⁵⁸ 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.

¹⁰⁵⁹ Miller, Kiri, 2008.

¹⁰⁶⁰ Reinhard, Andrew *Archaeogaming: An Introduction to Archaeology in and of Video Games*. Germany: Berghahn Books, 2018.

¹⁰⁶¹ Haverinen, Anna *Digital Death: Online Mourning Rituals and Practises*. London: Routledge, 2017.

¹⁰⁶² Champion, Erik *Social Presence and Cultural Presence in Oblivion*, 2007 [Online]. Available at: https://www.academia.edu/1003317/Social_Presence_and_Cultural_Presence_in_Obliion [Accessed 8th August 2018].

¹⁰⁶³ Hirschman, Jacob *Geography of Skyrim*, 2012 [Online]. Available at: <https://geoskyrim.blogspot.com> [Accessed 8th August 2018].

¹⁰⁶⁴ Appleton, Conor and Morris, Jake ‘Scaling Skyrim – a case study on the population of Solstheim’. *Journal of Interdisciplinary Science Topics*, 2018.

landscape or environment of *Skyrim*, the titular virtual environment in which the game takes place.

As well as installing modifications which improved the appearance of the game's textures, added new environmental effects such as shooting stars, and wove into the game complex new systems for simulating environmental effects such as hypothermia and fatigue, I also added a modification which allows the player to keep an in-game journal, which I used to record my observations. 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 reactivity and player observation, and how both systemic and non-systemic components of the environment contributed to my imaginative engagement in their own particular manners.

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 in *gestalt*. In this conception, the simulated province of *Skyrim* was a single entity, rather than a collection of overlapping systems, or disparate provinces and towns, maintaining a 'paradigmatic... unity'¹⁰⁶⁵, or animistic personification, which forms the basis of human autocosmic engagement with place (see Chapter 3). I witnessed the numerous designed systems that make up the landscape-as-whole as multiple vectors of communication with a coherent individual; means by which that individual could be known, and responded to. This individual is the

¹⁰⁶⁵ Margolin, Uri. 'Introducing and Sustaining Characters in Literary Narrative: A Set of Conditions'. *Style* 21 (1), pp.107 – 124, p.115.

complex place-person who/which, as I argue in Chapter 3, is the most ‘resonant’ character in the entire gamespace of *Skyrim*.

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 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://bonfireddog.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.¹⁰⁶⁶ 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 'live' bibliography for the project, hosted on the open-source referencing service Zotero.¹⁰⁶⁷ Please note that this bibliography is not completed to the specification of Bath Spa University's Numeric Referencing System¹⁰⁶⁸.

¹⁰⁶⁶ Iser, Wolfgang *The Implied Reader: Patterns of Communication in Prose Fiction from Bunyan to Beckett*. Baltimore: The John Hopkins University Press, 1978, p.3

¹⁰⁶⁷ Roy Rosenzweig Center of History and New Media *Zotero*, 2018. [Online] Available at: <http://zotero.org> [Accessed 25th August 2018].

¹⁰⁶⁸ 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://robsherman.co.uk>

<http://bonfireddog.co.uk>

My personal and business websites.

<http://robsherman.co.uk/thegoodlymist/tag/projects/>

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

<https://github.com/bonfireddog/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 installation. It also plays host to the illustrative videos, images and animations (see Appendix 9) that I use to augment my self-reflection throughout this thesis.

**[https://app.researchfish.com/awards/viewdetails/o?
gorderby=organisation&filter=AHRC-1672384](https://app.researchfish.com/awards/viewdetails/o?gorderby=organisation&filter=AHRC-1672384)**

The Researchfish profile for this project.¹⁰⁶⁹ 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. The maintenance of this profile is a stipulation of my funding from the Arts and Humanities Research Council.¹⁰⁷⁰

¹⁰⁶⁹ Research Fish Limited *researchfish(tm)*, 2018. [Online]. Available at: <https://www.researchfish.net/> [Accessed 25th August 2018].

¹⁰⁷⁰ 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 illustrative material supplementary to the main body of this thesis, referenced (and sometimes reproduced) 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 Machine¹⁰⁷¹ may have a copy of the files.

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

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

<https://github.com/bonfireddog/knole-latest/tree/master/masterbeast/prototypes>

* * * * *

The permalink for the folder containing the illustrative figures is **https://github.com/bonfireddog/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 3 of this thesis.

¹⁰⁷¹ *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 Storms¹⁰⁷².

Figures 3a - 3g – Screenshots from a prototype created as part of the installations' development. In this prototype, the moles which roam the creature's body are controlled by an artificially-intelligent 'Moleherd'. This 'Moleherd' could control the moles' movement, traversing the creature's skin just as Simon Awlbach 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.

Figure 4a – The initial paper design for the 'Moleherd'.

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 prototype version of the 'Temple' functionality of the creature. Inspired by a smartphone locking interaction, this became an important part of interacting with the 'Beest' – 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.

¹⁰⁷² Storms, Gus, *Gus Storms*, 2020 [Online]. Available at: <http://gusstorms.com> [Accessed 20th February 2020].

Figure 10 – A demonstration of the use of Microsoft Oxford Project's emotion recognition API as a key part of the interaction with the creature¹⁰⁷³.

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

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 installation.

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 1.

Figure 14 – A PDF of the Google Forms exit questionnaire given to participants in my videogame study, described in Appendix 3.

Figure 15 – A playable prototype of the 'cellar couple' functionality, as described in Chapter 3.7.

Figure 16 – A screenshot of the latest version of the project's website.

Figure 17 – A screenshot of a selection of pages from the *Housekeeping*.

Figure 18 – A screenshot of the Gamemaker IDE, used for the development of the simulation at the heart of the project.

¹⁰⁷³ Linn, Allison 'Microsoft's Project Oxford helps developers build more intelligent apps', *Microsoft AI Blog*, 2015 [Online]. Available at: <https://blogs.microsoft.com/ai/microsofts-project-oxford-helps-developers-build-more-intelligent-apps/> [Accessed: 19th December 2019].cite

Figure 19 – A photograph of the moorland on the Derbyshire/Yorkshire border, close to Stanage Edge: the ‘counterfactual’¹⁰⁷⁴ site for the village of Nighthead.

Figure 20 – A screenshot of the ‘Beest’, hanging alone in the ‘voyd’ that surrounds it.

Figure 21 – The ‘debug screen’ of the creature simulation, not ordinarily visible to visitors, displaying some of the internal parameters of the ‘Beest’s’ personality.

Figure 22 – A screenshot of an early prototype of a ‘Cowherd’ character or agent, which would roam the ‘Beest’s’ surface corralling its moles and blemishes like cattle. This led to the creation of the Simon Awlbach character in *knole*’s narrative, even though this computational agent was not finally implemented in the simulation.

Figure 23 – A short video showing the ‘Beest’ coming closer to the visitor: this presents the visitor with a depersonalised, myopic view of the ‘Beest’s’ flesh and its features.

Figure 24 – A short video, showing the moles roaming across the surface of the creature.

Figure 25 – An image of the mysterious ‘conkers’ that spread slowly across the creature’s flesh.

Figure 26 – A screenshot of the top of the creature’s head, with a red mole caught in bright moonlight.

Figure 27 – A screenshot of the ‘Beest’s’ eye, showing the *muscae volitans* drifting across it.

¹⁰⁷⁴ Dannenberg, Hilary, 2008, p. 113.

Figure 28 – A selection of the paratextual and intertextual forms included in the *Housekeeping*.

Figure 29 – A sketch from the *Housekeeping* of the ‘subscriber’s’ handkerchief, stitched with an auspicious pattern.

Figure 30 – An image showing the ballad, ‘The Warmth Without The Fyre’, included in the *Housekeeping*.

Figure 31 – An image showing the assize proceedings of the Marchand’s trial, overlain with Anne’s ‘amulotts’.

Figure 32 – An image showing the detail of the ‘Beest’s’ ‘scedule’, included by Anne in the *Housekeeping*.

Figure 33 – A short video showing the creature entering a state of compliant, ritual roboticism.

Figure 34 – An image showing the detail of the ‘tinktures’ that are included in the installation as part of Anne’s ritual practice.

Figure 35 – A short video showing a visitor using the creature’s ‘Temple’ - an auspicious arrangement of moles on its forehead that allow the visitor to draw patterns on its flesh.

Figure 36 – An image of the ‘Beest’s’ face with some of the traces of multiple visitors’ attentions – bruises, reddened marks, cuts and black eyes.

Figure 37 – A short video showing the ‘Beest’ angrily butting and bucking at a visitor from within its enclosure.

Figure 38 – A short video showing the ‘Beest’ sleeping peacefully, despite Anne’s promises that it requires no rest.

Figure 39 – An image of the ‘Grail’, part of the creature’s strange, utilitarian biology.

Figure 40 – An image of the strange object buried in the creature’s skin, which bears a striking resemblance to Sarah and Matthew Marchand, Anne’s adopted parents.

Figure 41 – An image showing how the ‘amulotts’ included in the *Housekeeping* can be rearranged to reveal the last words of Sarah Marchand.

Figure 42 – An image showing the hidden depths of the creature’s form – a bloodied stump, and a practical decapitation.

Bibliography

Exhibitions, Installations & Performance

- Akpan, Imeh *et al.* 'Exploring the effects of space and place on engagement with an interactive installation'. *Proceedings of SIGCHI Conference on Human Factors in Computing Systems*, 2013, pp. 2213 – 2222.
- Alisi, Thomas *et al.* 'Natural Interfaces To Enhance Visitor's Experiences'. *IEEE Multimedia* 12 (3), 2005, pp. 80 – 85.
- Amankulor, J. Ndukaku 'The Condition of Ritual in Theatre: An Intercultural Perspective'. *Performing Arts Journal* 11/12 (11), 1989, pp. 45 – 58.
- Benford, Steve and Giannachi, Gabriella *Performing Mixed Reality*. Massachusetts: The MIT Press, 2011.
- Benford, Steve and Giannachi, Gabriella. 'Interaction As Performance'. *Interactions* 19 (3), 2012, pp. 38-43.
- Birchall, Danny *Institution and Intervention: Artists' Projects in Object-Based Museums*. [MA Dissertation]. Birkbeck College, University of London.
- Bouquet, Mary. 'Thinking And Doing Otherwise: Anthropological Theory in Exhibitionary Practice'. In: Carbonell, Bettina Messias (eds.) *Museum Studies: An Anthology of Contexts*. Chichester: Wiley-Blackwell, 2012.
- Bown, Oliver *et al.* 'The Machine as Autonomous Performer'. In: Candy, Linda and Ferguson, Sam, (eds.), 2014, pp. 75 – 90.
- Bowman, Sarah Lynne *The Functions of Role-Playing Games: How Participants Create Community, Solve Problems and Explore Identity*. North Carolina: McFarland and Company, 2010.
- Calvi, Licia and Spence, Jocelyn 'Engaging Audiences in Museums in a Performance Way'. *Proceedings of the Digital Research in the Humanities and Arts Conference*, 2014, pp. 131 – 145.
- Cardiff, Janet *To Touch*, 1993 [Online]. Available at: <http://www.cardiffmiller.com/artworks/inst/totouch.html#> [Accessed: 18th August 2018].
- Chalmers, M *et al.* 'Seamful design: showing the seams in wearable computing'. *IEE Eurwearable*, 2003, pp. 11 – 16.
- Champion, Erik 'Cultural Interaction and a Sense Of Place In A Digital Environment'. [Research Paper], 2002, [Online]. Available at: <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.2.5132&rep=rep1&type=pdf> [Accessed: 20th June 2020].
- Champion, Erik and Dekker, Andrew 'Biofeedback and Virtual Environments'. *International Journal of Architectural Computing* 9 (4), 2011, pp. 377 – 395.
- Chroinin, Mairead Ni 'Review: Performing Mixed Reality'. *Int. J. of Performance Arts and Digital Media* 11 (1), 2015, pp. 116 – 119.
- Clay, Jean 'Art Tamed and Wild'. In: Alberro, Alexander and Stimson, Blake (eds.) *Conceptual Art: A Critical Anthology*. Massachusetts: The MIT Press, 2000, pp. 136 – 141.
- Dalsgard, Peter and Hansen, Lone Koefoed 'Performing Perception – Staging Aesthetic of Interaction'. *ACM Transactions of Computer-Human Interaction* 15 (3), 2008, pp. 13 – 46.
- Davey, Gareth 'What is Museum Fatigue?'. *Visitor Studies Today* 8 (3), 2005, pp. 17 – 21.
- Dean, David. *Museum Exhibition: Theory and Practice*. London: Routledge, 1994.

Domingues, Diana 'Interactivity And Ritual: Body Dialogues With Artificial Systems', *LatinArt*, 2001 [Online]. Available at: <http://www.latinart.com/aiview.cfm?id=16> [Accessed: 20th January 2021].

Edmond Jones, Robert *The Dramatic Imagination: Reflections and Speculations on the Art of Theatre*. London: Routledge, 2004.

'Exhibiting Difficult Games', *Matheson Marcault*, 2017 [Online]. Available at: <http://mathesonmarcault.com/index.php/2017/11/16/exhibiting-difficult-games/> [Accessed: 20th January 2021].

Falk, John 'The use of time as a measure of visitor behaviour and exhibit effectiveness'. *Roundtable Reports* 7 (4), 1982, pp. 10 – 13.

Fischer-Lichte, Erika *The Transformative Power of Performance: A New Aesthetics*. London: Routledge, 2008.

Frost, Anthony and Yarrow, Ralph *Improvisation in Drama, Theatre and Performance: History, Practice, Theory*. London: Palgrave Macmillan, 2007.

Gammon, Ben 'Visitors' Use of Computer Exhibits: Findings from 5 Grueling Years of Watching Visitors Getting It Wrong.' *Informal Learning* 38 (1), pp. 10 – 13.

Giesen, Bernhard 'Performance Art'. In: Alexander, Jeffrey C. et al. (eds.) *Social Performance: Symbolic Action, Cultural Pragmatics and Ritual*. Cambridge: CUP, 2006, pp. 315 – 324.

Hornecker, 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.

Hornecker, Eva "I don't understand it either, but it is cool" - visitor interactions with a multi-touch table in a museum'. 2008 3rd IEEE International Workshop on Horizontal Interactive Human Computer Systems, 2008, pp. 113 – 120.

Ioannides, Marinos et al. *Mixed Reality and Gamification for Cultural Heritage*. London: Springer, 2017.

Jones, Ruth 'Ritual Creativity and Performance in Contemporary Art and Anthropology', *University of Leeds* [Online]. Available at: <https://land2.leeds.ac.uk/ritual-creativity-performance-contemporary-art-anthropology/> [Accessed: 20th January 2021].

Kolva, Borianana et al. 'Traversable Interfaces Between Real and Virtual Worlds' *Proceedings of the Computer-Human Interaction Conference 2000*. ACM, 2000.

Ljungar Chapelon, M. 'Virtual Bodies in Ritual Procession – Digital co-production for actors and interpreters of the past'. *Internet Archaeology* 46 (1), 2017.

Ma, Minhua et al. 'Interact: A Mixed Reality Virtual Survivor for Holocaust Testimonies'. *OzCHI*, 2015, Melbourne Australia.

Meisner, Robin et al. 'Exhibiting Performance: Co-participation in science centres and museums'. *International Journal of Science Education* 29 (12), 2007, pp. 1531 – 1555.

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.

Morie, J. 'Performing In (Virtual) Spaces: Embodiment and Being in Virtual Environments'. *IJPADM* 3 (2/3), 2007.

Myounghoon, Jeon et al. 'From rituals to magic: interactive art and HCI of the past, present and future'. *International Journal of Human-Computer Studies* 131 (1), 2019, pp. 108 – 119.

Nam, Hye Yeon and Nitsche, Michael 'Interactive installations as performance: Inspiration for HCI'. *Proceedings of the 8th International Conference on Tangible, Embedded and Embodied Interaction*, 2014.

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].

Perry, Grayson *The Tomb of the Unknown Craftsman*. London: AVA, 2011.

Reed, Emilie M. *Arcades, Let's Plays and Avant-Gardes: perspectives for analysing and developing videogame exhibitions for arts audiences*. PhD thesis: Abertay University, 2019.

Scott, Susie. 'Shyness in interactive art galleries and museums: a symbolic interactionist account'. Nordic Sociological Association (NSA) Annual Conference, Oslo, Norway, 2011.

Scott, Susie *et al.* 'Goffman in the Gallery: Interactive Art and Visitor Shyness'. *Symbolic Interaction* 36 (4), 2013, pp. 417 – 438.

Slater, Mel and Wilbur, Sylvia 'A Framework for Immersive Virtual Environments (FIVE): Speculations on the Role of Presence in Virtual Environments'. *Presence* 6 (6), 1997, pp. 603 – 616.

Spence, Jocelyn *Performative Experience Design*. London: Springer, 2016.

Spence, Jocelyn *et al.* 'Seeing with New Eyes: Design for In-the-Wild Museum Gifting'. *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems*, 2019, pp. 1 – 13.

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].

Tyler-Jones, Matthew *Building an Apotheosis Machine*. York University Department of Archaeology, February 10th, 2015.

Ward, Frazer *No Innocent Bystanders: Performance Art and Audience*. New England: Dartmouth College Press, 2012.

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].

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Adajian, Thomas, *The Definition of Art*, 2018 [Online]. Available at: <https://plato.stanford.edu/entries/art-definition/> [Accessed 8th August 2018].

Alber, Jan *Unnatural Narrative: Impossible Worlds in Fiction and Drama*. Nebraska: University of Nebraska Press, 2016.

Alexander, Marc and Emmott, Catherine 'Schemata'. In: Huhn, P. (eds.) *Handbook of Narratology*. Berlin: De Gruyter, 2014.

Apokryltaros *et al.* (eds.), 'Chaac', *Wikipedia*, 2019 [Online]. Available at: <https://en.wikipedia.org/wiki/Chaac> [Accessed 3rd December 2019].

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].

Baker, Malcolm and Richardson, Brenda *A Grand Design: The Art of the Victoria and Albert Museum*. London: Victoria and Albert Museum, 1997.

Barsalou, Lawrence W. 'Grounded Cognition'. *Annual Review of Psychology* 59, 2008, pp.617 – 645.

Bartlett, F.C. *Remembering*. Cambridge: Cambridge University Press, 1932.

- Barrett, Justin *Why Would Anyone Believe In God?* Altamira: Walnut Creek, 2004.
- Barrett, Justin 'Cognitive Science of Religion: What Is It & Why Is It?' *Religion Compass* 1 (1), 2007.
- 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].
- Bednarik, Robert G. 'Rock art and pareidolia'. *AURA* 33 (2), 2016, pp. 167 – 181.
- Benzon, William 'The Evolution of Narrative and the Self'. *Journal of Social and Evolutionary Systems*, 16 (2), 1993, pp.129 – 155.
- 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.
- Bley, Edgar S 'Identification: A Key to Literature'. *The English Journal* 34 (1), 1945.
- Bordwell, David 'Three Dimensions of Film Narrative'. In: Bordwell, David *Poetics of Cinema*. London: Routledge, 2007.
- Bortolussi, Marisa and Dixon, Peter *Psychonarratology: Foundations for the Empirical Study of Literary Response*. Cambridge: Cambridge University Press, 2003.
- Bortolussi, Marisa and Dixon, Peter *Psychonarratology: Foundations for the Empirical Study of Literary Response*. Cambridge: Cambridge University Press, 2003.
- Boyer, Pascal 'Religious Thought and Behaviour as By-Products of brain function'. *Trends in Cognitive Sciences* 7, 2003, pp. 119 – 124.
- Bradley, Laura *Brecht and Political Theatre: The Mother on Stage*. Oxford: OUP, 2006.
- 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].
- Bruner, Jerome 'The Narrative Construction of Reality'. *Critical Inquiry* 18 (1), 1991, pp.1 – 21.
- 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.
- Byrne, Ruth 'Precis of The Rational Imagination: How People Create Alternatives to Reality'. *Behavioral and Brain Sciences* 30 (1), 2007, pp. 439 – 480.
- 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.
- Caracciolo, Marco 'The Reader's Virtual Body: Narrative Space and its Reconstruction'. *Storyworlds* 3, 2011, pp. 117 – 138.
- Caracciolo, Marco 'Narrative Space and Reader's Response to Stories: A Phenomenological Account'. *Style* 47 (4), 2013, pp. 425 – 444.
- 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.
- Carroll, Joseph 'Evolution and literary theory'. *Human Nature* 6 (2), 1995, pp. 119 – 134.
- Chan, Janet *et al.* 'Bridging the Two Cultures: The Fragility of Interdisciplinary Creative Collaboration'. In: Fischer, Gerhard and Vassen, Florian (eds.) *Collective Creativity*. Brill, 2011, pp. 159 – 176.

- 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.
- Clark, Andy *Supersizing the Mind: Embodiment, Action, and Cognitive Extension*. Oxford: Oxford University Press, 2008.
- Coe, Kathryn *et al.* 'Once Upon A Time: Ancestors and the Evolutionary Significance of Stories'. *Anthropological Forum* 16 (1), 2006, pp. 21- 40.
- Cohen, David and Mackeith, Stephen *The Development of Imagination: The Private Worlds of Childhood*. London: Routledge, 1992.
- 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.
- Costa, Vincent D. *et al.* 'Emotional imagery: Assessing pleasure and arousal in the brain's reward circuitry'. *Human Brain Mapping* 31 (9), 2010, pp. 1446 – 1457.
- Cowart, Monica *Embodied Cognition* [Online]. Available at: <https://www.iep.utm.edu/embodcog/> [Accessed 8th August, 2018].
- Cowart, Monica Wilson, Rlia, Lucia 'Embodied Cognition', *Stanford Encyclopedia of Philosophy*, 2015 [Online]. Available at: <https://plato.stanford.edu/archives/spr2017/entries/embodied-cognition/> [Accessed: 12th December 2019].
- Crittenden, Charles 'Fictional characters and logical completeness'. *Poetics* 11 (4-6), 1982, pp. 331- 344.
- Dannenberg, Hilary *Coincidence and Counterfactuality: Plotting Time and Space in Narrative Fiction*. Nebraska: U of Nebraska P, 2008.
- Dautenhahn , Kerstin 'Stories of lemurs and robots: The social origin of story-telling'. In: Mateas, Michael and Sengers, P. (eds.) *Advances in Consciousness Research, Vol. 46. Narrative intelligence*. US: John Benjamins, 2003, pp. 63 – 90.
- Dennett, Daniel *The Intentional Stance*. Massachusetts: The MIT Press, 1998.
- Dennett, Daniel C. *Breaking The Spell: Religion as a natural phenomenon*. London: Penguin, 2007.
- 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.
- Dix, Alan *et al. Human-Computer Interaction*. Essex: Pearson, 2004.
- Downs, Roger and Stea, David. *Image & environment: Cognitive mapping and spatial behavior*. New York: Routledge, 1973.
- Elsner, John 'Image and ritual: reflections on the religious appreciation of classical art'. *The Classical Quarterly* 46 (2), 1996, pp. 515-531.
- Emmeche, Claus 'Does a robot have an Umwelt? Reflections on the qualitative biosemiotics of Jakob von Uexkull'. *Semiotica* 134 (1/4), 2001, pp. 653 – 693.
- Emmott, Catherine *Narrative Comprehension: A Discourse Perspective*. Oxford: OUP, 1997.
- Eskenlinen, Markku *Markku Eskenlinen's Response*, 2004 [Online]. Available at: <http://electronicbookreview.com/essay/markku-eskenlinens-response/> [Accessed 8th August 2018].
- Farah, Martha J and Heberlein, Andrea S. 'Personhood and neuroscience: naturalizing or nihilating?' *Am J Bioeth* 7 (1), 2007, pp. 37 – 48.

- Farrow, Tom F.D. *et al.* 'Investigating the functional anatomy of empathy and forgiveness'. *Neuroreport* 12 (11), 2001, pp. 2433 – 2438.
- 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.
- Fludernick, Monika *Towards a 'Natural' Narratology*. London: Routledge, 1996.
- 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.
- Francis, Andrea P. and Mishra, Punya 'Differences in Children's Verbal Responses and Behavioral Interactions with Anthropomorphic Artifacts', 2008.
- Gao, Tao and Scholl, Brian. 'Chasing vs. Stalking: Interrupting the perception of animacy'. *Journal of Experimental Psychology* 37 (3), 2011, pp. 669 – 684.
- Gendler, Tamar 'Imagination', *Stanford Encyclopedia of Philosophy*, 2019 [Online]. Available at: <https://plato.stanford.edu/entries/imagination/> [Accessed: 20th December 2010].
- 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.
- Giles, David 'Parasocial Interaction: A Review of the Literature and a Model for Future Research'. *Media Psychology* 4 (3), 2002, pp. 279 – 305.
- Glob, Peter Vilhelm 'The Bog People: Iron-Age Man Preserved'. London: Faber and Faber, 1969.
- Goffman, Erving *Frame analysis: An essay on the organisation of experience*. Massachusetts: HUP, 1974.
- Goldman, Alvin *Simulating Minds: The Philosophy, Psychology and Neuroscience of Mindreading*. Oxford: Oxford University Press, 2006.
- Gray, John 'Split Religion', *Literary Review*, October 2007.
- Guthrie, Stewart. *Faces In The Clouds: A New Theory Of Religion*. New York: OUP, 1993.
- Harari, Noah Yuval. *Sapiens*. London: Harvill Secker, 2014.
- Harley, David, *Watching The Furby Fly*, 2015 [Online]. Available at: <http://itsecurity.co.uk/2015/09/watching-the-furby-fly/> [Accessed 8th August 2018].
- Hartz, Glenn 'How We Can Be Moved by Anna Karenina, Green Slime, and a Red Pony.' *Philosophy* 74, 1999, pp. 557-78.
- Heider, Fritz and Simmel, Marianne 'An Experimental Study of Apparent Behaviour'. *The American Journal of Psychology* 57 (2), 1944, pp. 243 – 259.
- Hendrick, Bram *et al.* 'Robot Vacuum Cleaner Personality and Behavior'. *International Journal of Social Robotics*. 3 (1), 2011, pp. 187 – 195.
- Herman, David *Story/Logic: Problems and Possibilities of Narrative*. Nebraska: University of Nebraska Press, 2002.
- Herman, David 'The Nexus Of Narrative And Mind' In: Herman, David *Basic Elements Of Narrative*. London: Wiley, 2009.
- 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].
- Herman, David. *Narratology Beyond The Human*. Oxford: Oxford University Press, 2018.

- Hoff, Eva 'Imaginary Companions, Creativity and Self-Image in Middle Childhood'. *Creativity Research Journal* 17 (2-3), 2005, pp. 167 – 180.
- 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.
- Hubbs, Joanna *Mother Russia: The Feminine Myth in Russian Culture*. Indiana: Indiana University Press, 1993.
- Johnson-Laird, P.N. *Mental Models: Towards a Cognitive Science of Language, Inference and Consciousness*. Massachusetts: Harvard UP, 1983.
- 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.
- Kapogiannis, Dimitrios *et al.* 'Cognitive and Neural Foundations of Religious Belief'. *Proceedings of the National Academy of Sciences* 106 (12), 2009. pp. 4876 – 4881.
- Kaufman, Geoff and Libby, Lisa 'Changing Beliefs and Behavior Through Experience-Taking'. *Journal of Personality and Social Psychology*. 2012.
- Kidd, David Comer and Castano, Emanuele 'Reading Literary Fiction Improves Theory Of Mind'. *Science* 342 (6156), 2013, pp.377 – 380.
- Kitchin, Rob and Freundschuh, Scott (eds.). *Cognitive Mapping: Past, Present and Future*. London: Routledge, 2000.
- 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.
- Koenig, Nikolaus "'Imaginary Systems" - Media Comprehension, and the Systemic Organization of Human Experience' *Systema* 4 (2), 2016, pp. 29-47.
- Kriswirth, Martin 'Merely Telling Stories? Narrative and Knowledge in the Human Sciences'. *Poetics Today* 21 (2), 2000, pp.293 – 318.
- Kriswirth, Martin 'Narrative Turn.' In: Herman, David *et al.* (eds). *The Routledge Encyclopedia of Narrative Theory*. London: Routledge, 2005, pp 377–382.
- 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.
- Kull, Kalevi *et al.* 'Theses on Biosemiotics: Prolegomena to a Theoretical Biology'. *Biological Theory* 4 (2), 2009, pp.167–173.
- Labov, W. 'Some further steps in narrative analysis'. *Journal of Narrative and Life History* 7 (1-4), 1997, pp. 395 – 415.
- Lau, Lisa and Pasquini, Margaret 'Meeting grounds: perceiving and defining interdisciplinarity across the arts, social sciences and sciences. *Interdisciplinary Science Reviews* 29 (1), 2004, pp. 49 – 64.
- Layton, Robert *The Anthropology Of Art*. Cambridge, CUP, 2009.
- LeDoux, Joseph 'The Emotional Brain: From Soul To Synapses' *Biological Psychiatry* 55, 2004.
- Levi-Strauss, Claude, Needham, Rodney (trans.). *Totemism*. London: Random House, 1971.
- Lessa, Rodrigo and Araujo, Joao 'World Consistency'. In: Wolf, Mark J. P. (eds.) *The Routledge Companion to Imaginary Worlds*. Oxon: Routledge, 2018.
- Markowski, Michel Pawl 'Anthropology and Literature' *Teksty Drugie*, 2007, pp. 24 – 33.
- Martinez Bonati, Felix *Fictive Discourse and the Structures of Literature: A Phenomenological Approach*. New York: Cornell University Press, 1981.

- Mellmann, Katja 'On the Emergence of Aesthetic Illusion An Evolutionary Perspective'. In: Wolf, Werner (eds.) *Immersion and Distance: Aesthetic Illusion in Literature and Other Media*. Amsterdam: Rodopi, 2013.
- Merleau-Ponty, Maurice *The Phenomenology of Perception*. New York: Routledge, 2012.
- Messer, Ellen 'Rappaport, Roy A', *Encyclopedia of Religion*, 2000 [Online]. Available at: <https://www.encyclopedia.com/environment/encyclopedias-almanacs-transcripts-and-maps/rappaport-roy> [Accessed: 12th March 2000]. Rappaport, Roy, 1999,
- Milkowski, Marcin. *Explaining The Computational Mind*. London: The MIT Press, 2013.
- Moran, Richard 'The Expression Of Feeling In Imagination'. *The Philosophical Review* 103 (1), 1994, pp. 75 – 106.
- Morris, Desmond *The Artistic Ape: Three Million Years Of Art*. Chichester: Red Lemon, 2013.
- Morriss-Kay, Gilliam M. 'The evolution of human artistic creativity'. *Journal of Anatomy* 216 (2), 2010, pp. 158 – 176.
- 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.
- Nash, Christopher *World-Games: The Tradition of Anti-Realist Revolt*. London and New York: Methuen, 1987.
- 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.
- Novitz, David *Knowledge, Fiction and Imagination*. Philadelphia, Temple University Press, 1987.
- Nass, Clifford and Moon, Youngme 'Machines and Mindlessness: Social Responses to Computers'. *Journal of Social Issues* 56 (1), 2000, pp.81 – 103.
- 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.
- 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.
- Oatley, Keith 'Emotional Intelligence and the Intelligence of Emotions'. *Psychological Enquiry* 15 (3), 2004, pp.216 – 222.
- Oatley, Keith 'The mind's flight simulator'. *The Psychologist* 21 (12), 2008, pp. 1030 – 1032, pp.1031.
- Ong, Walter J. *Orality and Literacy*. London: Routledge, 2013.
- Ono, Sokyō *Shinto: The Kami Way*. USA: Tuttle, 1962
- Pinker, Steven *How The Mind Works*. New York: Norton, 1997.
- Radford, Colin 'How Can We Be Moved by the Fate of Anna Karenina?' *Proceedings of the Aristotelian Society* 49, 1975, pp. 67-80.
- Rain, Marina *et al.* 'Adult attachment and transportation into narrative worlds'. *Personal Relationships* 24 (1), 2016, pp.49 – 74.
- Rappaport, Roy. *Ritual and Religion in the Making of Humanity*. Cambridge: Cambridge University Press, 1999.
- Ricoeur, Paul *et al.* *Time and Narrative*. Chicago and London: University of Chicago Press, 1990.

- Robertson, Benjamin J. 'World Completeness'. In: Wolf, Mark J.P. (eds.), 2018.
- Rochberg-Halton, Eugen 'Object Relations, Role models and Cultivation of the Self'. *Environment and Behavior* 16 (3), 1984, pp. 335 – 368.
- Ronen, Ruth *Possible Worlds In Literary Theory*. Cambridge: Cambridge University Press, 1994.
- Rosch, Eleanor *et al. The embodied mind: Cognitive science and human experience*. Massachusetts: The MIT Press, 1991.
- Ryan, Marie-Laure 'Semantics, Pragmatics and Narrativity: A Response to David Rudrum'. *Narrative* 14 (2), 2006, pp. 188 – 196.
- 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.
- 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: Transcript, 2013, pp. 27 – 50.
- Säätelä, Simo 'Fiction, Make-Believe and Quasi Emotions.' *British Journal of Aesthetics* 34, 1994, pp. 25-34.
- Sagan, Carl *The Demon-Haunted World: Science as a Candle in the Dark*. London: Random House, 2011.
- Saslow, Carol A. 'Understanding the Perceptual World of Horses'. *Applied Animal Behaviour Science* 78 (2-4), 2002, pp.209 – 224.
- 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].
- Schabert, Ina 'Fictional Biography, Factual Biography, and their Contaminations'. *Biography* 5 (1), 1982, pp.1 – 16.
- Schank, Roger and Abelson, Robert *Scripts, Plans, Goals and Understanding: An Inquiry into Human Knowledge Structures*. New Jersey, LEA, 1977.
- Scheele, Dirk *et al.* 'A human tendency to anthropomorphize is enhanced by oxytocin'. *European Neuropsychopharmacology* 25 (10), 2015, pp. 1817 – 1823.
- Scheibe, Karl E. and Barrett, Frank *The Storied Nature of Human Life: The Life and Work of Theodore R. Sarbin*. London: Palgrave Macmillan, 2017.
- Schmid, Wolf 'Eventfulness, Subject-dependency and Context'. *Foreign Language and Literature* 2 (1), 2010.
- 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].
- 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.
- Shapiro, Lawrence *The Mind Incarnate*. Massachusetts: The MIT Press, 2004.
- Sharov, Alexei A. 'Functional Information: Towards Synthesis of Biosemiotics and Cybernetics'. *Entropy* 12 (5), 2010, pp.1050 – 1070.
- Shedlosky-Shoemaker, Randi *et al.* 'Self-Expansion Through Fictional Characters'. *Self And Identity* 13 (5), 2014, pp. 556 – 578.
- Shelley, James *The Concept of The Aesthetic*, 2017 [Online]. Available at: <https://plato.stanford.edu/entries/aesthetic-concept/#AesObj> [Accessed 8th August 2018].

- Shepard, Paul and Shepard, Florence. *Coming Home To The Pleistocene*. Washington D.C.: Island Press, 1998.
- 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 8th August 2018].
- Shermer, Michael *Why People Believe Weird Things*. USA: Henry Holt, 1997.
- Shusterman, Richard 'Art as a Substitute for Religion' [Lecture]. Helsinki: Tieteiden Talo Hall, June 8th 2009.
- Sternberg, Meir 'Reconceptualising narratology. Arguments for a Functionalist and Constructivist Approach to Narrative'. *Enthymema* 4 (1), 2001, pp. 34 – 50.
- Sternberg, Meir 'Universals of Narrative and Their Cognitivist Fortunes'. *Poetics Today* 24 (3), 2003, pp. 517 – 638.
- Stever, Gayle 'Parasocial and Social Interaction with Celebrities: Classification of Media Fans'. *Journal of Media Psychology* 14 (3), 2009.
- Stever, Gayle 'Mediated vs. Parasocial Relationships: An Attachment Perspective'. *Journal of Media Psychology* 17 (3), 2013.
- Sugiyama, Michelle 'On the origins of narrative : Storyteller bias as a fitness-enhancing strategy' *Human Nature* 7 (4), 1996, pp. 403 – 425.
- Sugiyama, Michelle 'Food, foragers, and folklore: the role of narrative in human subsistence'. *Evolution and Human Behavior* 22 (4), 2001, pp.221 – 240.
- Taylor, Marjorie *Imaginary Companions and the Children Who Create Them*. Oxford, OUP, 1999.
- 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.
- 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.
- 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.
- Thompson, E. and E. Rosch *The Embodied Mind: Cognitive Science and Human Experience*, Cambridge: MIT Press, 1991.
- Toolan, Michael *Coherence*, 2013 [Online]. Available at: <http://www.lhn.uni-hamburg.de/article/coherence> [Accessed; 20th August 2018].
- Tsay, Mina and Krakowiak, Maja 'The impact of perceived character similarity and identification on moral disengagement'. *IJART* 4, 2011, pp.102 – 110.
- Turl, Adam 'Interrupting Disbelief: Narrative Conceptualism and Anti-Capitalist Studio Art', *Red Wedge*, 2015 [Online]. Available at: <https://www.redwedgemagazine.com/essays/interrupting-disbelief-ilya-kabakov-narrative-conceptualism-and-anti-capitalist-studio-art> [Accessed: 20th December 2019].
- Waytz, Adam *et al.* 'Response of Dorsomedial Prefrontal Cortex Predicts Altruistic Behavior'. *The Journal Of Neuroscience* 32 (22), 2012, pp.7646 – 7650.
- Wilson, Margaret 'Six views of embodied cognition'. *Psychonomic Bulletin & Review* 9 (4), 2002, pp. 625 – 636.
- Vermeule, Blakey *Why Do We Care About Literary Characters?* Baltimore: John Hopkins University Press, 2010.

Vogeley, Kai and Fink, Gereon 'Neural correlates of the first-person perspective'. *Trends in Cognitive Sciences* 7 (1), 2003, pp. 38-42.

Walton, Kendall 'Spelunking, Simulation and Slime: On Being Moved by Fiction'. In: Hjort, Metta (eds.) *Emotion and the Arts*. Oxford: Oxford University Press, 1997.

Watson, Rachel 'Little girl's fear of 'evil' lurking in cute Furby'. *Daily Mail*, 10/02/14.

Westphal Tally Jr., Robert *Topophilia: Place, Narrative and the Spatial Imagination*. Indianapolis: IUP, 2019.

White, Hayden 'The Value Of Narrativity in the Representation of Reality'. *Critical Inquiry* Autumn 1980, pp. 5 – 28.

Whitmarsh, Tim 'Mythology In Bits', *London Review Of Books*, 2018 [Online]. Available at: <https://www.lrb.co.uk/the-paper/v40/n24/tim-whitmarsh/mythology-in-bits> [Accessed: 20th March 2020].

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.

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.

Zunshine, Lisa *Why We Read Fiction: Theory of Mind and the Novel*. Columbus: The Ohio State University Press, 2006.

Narratology & Character Theory

Abbot, H. Porter *Narrativity*, 2011 [Online]. Available at: <https://wikis.sub.uni-hamburg.de/lhn/index.php/Narrativity> [Accessed 8th August 2018].

Aristotle, *Poetics*. London: Penguin Classics, 1996.

Bal, Mieke *Reading Rembrandt: Beyond The Word-Image Opposition*. Amsterdam: Amsterdam University Press, 2006.

Barthes, Roland *Image-Music-Text*. New York: Hill and Wang, 1977.

Bennett, Susan *Theatre Audiences: A theory of production and reception*. London: Routledge, 1997.

Berleant, Arnold *Aesthetics and Environment: Variations on a Theme*. London: Routledge, 2004.

Berleant, Arnold 'What Is Aesthetic Engagement?', *Contemporary Aesthetics*, 2013 [Online]. Available at: <https://contempaesthetics.org/newvolume/pages/article.php?articleID=684> [Accessed: 20th October 2019].

Berleant, Arnold 'Developments in Aesthetic Engagement?', *Contemporary Aesthetics* [Online]. Available at: <https://contempaesthetics.org/newvolume/pages/article.php?articleID=684>> [Accessed: 20th December, 2019].

Berleant, Arnold and Hepburn, Ronald 'An Exchange on Disinterestedness', *Contemporary Aesthetics* [Online]. Available at: <http://contempaesthetics.org/newvolume/pages/article.php?articleID=209>

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.

Bleich, David *Subjective Criticism*. Baltimore: The John Hopkins University Press, 1978.

Booth, Wayne C. *The Rhetoric of Fiction*. London: University of Chicago Press, 1961.

Boswijk, Albert *et al.* *The Economy Of Experiences*. Amsterdam: European Centre for the Experience and Transformation Economy, 2012.

- Bradbury, Malcolm 'Character'. In: Childs, Peter and Fowler, Roger *The Routledge Dictionary Of Literary Terms*. London: Routledge, 2006,.
- Brooks, Peter *Reading for the Plot: Design and Intention in Narrative* Massachusetts: Harvard University Press, 1984.
- Bullough, Edward 'Psychical Distance' As A Factor In Art And An Aesthetic Principle'. *Psychology* 5 (2), 1912, pp. 87 – 118.
- 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.
- Chatman, Seymour *Story And Discourse: Narrative Structure in Fiction and Film*. London: Cornell University Press, 1980.
- Childs, Peter and Fowler, Roger, *The Routledge Dictionary of Literary Terms*. New York: Routledge, 2006.
- Cioffi, Frank. 'Intention and Interpretation in Criticism'. *Proceedings of the Aristotelian Society* 64 (85), 1963.
- Cixous, Helene 'The Character of "Character"'. *New Literary History* 5 (2), 1974, pp. 383-403.
- 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.
- Cohn, Dorritt 'Fictional versus Historical Lives: Borderlines and Borderline Cases'. *The Journal of Narrative Technique*. 19 (1), 1989, pp. 3-24.
- Coleridge, Samuel Taylor, Leask, Nigel (eds.) *Biographia Literaria*. London: J.M. Dent, 1997.
- Currie, Gregory 'Narrative and the Psychology of Character'. *The Journal of Aesthetics and Art Criticism*, 2009, pp. 1 – 12, p. 61 – 71.
- DeMaria Jr., Robert 'The Ideal Reader: A Critical Fiction'. *PMLA* 93 (3), 1978, pp. 463-474.
- Eagleton, Mary 'Feminism and the Death of the Author'. In: Eagleton, Mary *Figuring The Woman Author in Contemporary Fiction*. London: Springer, 2005, pp. 15 – 36.
- Eco, Umberto, Splendore, Paola (trans.) *Towards a Semiotic Inquiry Into the Television Message*. *Working Papers in Cultural Studies* 3, 1972, pp.103-21.
- Elias, Amy J. 'Postmodern Metafiction'. In: Duvall, John N. (eds.) *The Cambridge Companion To American Fiction After 1945*. Cambridge: CUP, 2012, pp. 15 – 29.
- Farrell, John *The Varieties of Authorial Intention: Literary Theory Beyond the Intentional Fallacy*. London: Palgrave Macmillan, 2017.
- Felski, Rita. 'Introduction'. *New Literary History*, 42 (2), 2011, pp.v-ix.
- Fish, Stanley 'Interpreting the "Variorum"' *Critical Enquiry* 2 (3), 1976, pp.465-485.
- Fish, Stanley *Is There a Text in This Class? The Authority of Interpretative Communities*. Massachusetts: Harvard University Press, 1982.
- Fimi, Dimitra 'The Past as an Imaginary World: The Case of Medievalism'. In: Wolf, Mark J.P. (eds.) *Revisiting Imaginary Worlds: A Subcreation Studies Anthology*. New York: Routledge, 2017, pp. 46 – 66.
- Friend, Stacie 'Fictional Characters'. *Philosophy Compass* 2 (2), 2007, pp.141-156.
- Gehlen, A *Zur Soziologie und Asthetik der modernen Malerei*. Frankfurt: Athenaur, 1960.
- Gernsbacher, Morton Ann *et al.*, 'Do Readers Mentally Represent Characters' Emotional States?' *Cogn Emot* 6 (2), 1992, pp. 89-111.

- Gerrig, Richard J. *Experiencing Narrative Worlds: On the Psychological Activities of Reading*. New Haven: Yale UP, 1993.
- Gibson, Walker 'Authors, Speakers, Readers, and Mock Readers'. *College English* 11, 1950, pp. 265 -269.
- Gombrich, Ernst H. *Art And Illusion*. New Jersey: Princeton UP, 1960.
- 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
- Green, Melanie *et al.* 'Understanding Media Enjoyment: The Role of Transportation Into Narrative Worlds'. *Communication Theory* 4 (3), 2004, pp.311-327.
- Green, Melanie C. *et al.* *Narrative Impact: Social and Cognitive Foundations*. London: Taylor and Francis, 2003.
- Green, Vivien (eds.) *Italian Futurism 1909 – 1944: Reconstructing the Universe*. New York: Guggenheim, 2014.
- Greenblatt, Stephen 'Resonance and Wonder'. *Bulletin of the American Academy of Arts and Sciences* 43 (4), 1990, pp. 11-34.
- Groeneveld, Leanne 'A Theatrical Miracle: The Boxley Rood of Grace as Puppet'. *Early Theatre* 10 (2), 2007, pp.1 – 40.
- Haque, Omar Sultan and Waytz, Adam 'Dehumanization in Medicine: Causes, Solutions and Functions'. *Perspectives on Psychological Science* 7 (2), 2012, pp. 176-186
- 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.
- Hiebert, Dennis "'The Massive Subjective Turn": Sociological Perspectives of Spirituality'. *Journal of Sociology & Christianity* 8 (2), 2018, pp. 55 – 75.
- Hirschman, Elizabeth C. 'Applying Reader-Response Theory to a Television Program'. *Advances in Consumer Research* 26, 1999, pp. 549-554.
- Holland, Norman. *Poems In Persons: An introduction to the psychoanalysis of literature*. New York: W.W. Norton & Company, 1974.
- Holland, Norman *The Nature of Literary Response: Five Readers Reading*. New Jersey: Transaction, 2011.
- Holub, Robert C. *Reception Theory: A Critical Introduction*. London: Methuen, 1984.
- Iser, Wolfgang 'The Reading Process: A Phenomenological Approach'. *New Literary History* 3 (2), 1972 PP.279 – 299.
- Iser, Wolfgang *The Act of Reading: A Theory of Aesthetic Response*. Baltimore: The John Hopkins University Press, 1978.
- Iser, Wolfgang *The Implied Reader: Patterns of Communication in Prose Fiction from Bunyan to Beckett*. Baltimore: The John Hopkins University Press, 1978.
- Jannidis, Fotis, 'Character' the living handbook of narratology, 2013 [Online]. Available at: <https://www.lhn.uni-hamburg.de/node/41.html> [Accessed: 20th October 2019].
- Jauss, Hans Robert *Toward an Aesthetic of Reception*. Minneapolis: University of Minnesota, 1982.82.
- Karlsson, F. 'Anthropomorphism and mechanomorphism'. *Humanimalia* 3 (2), 2012, pp. 107 – 122.
- Keen, Suzanne 'Reader's Temperaments and Fictional Character'. *New Literary History* 42 (2), 2011, pp.295 – 314.

- Koblizek, Tomas eds. *The Aesthetic Illusion in Literature and the Arts*. London: Bloomsbury, 2017.
- Kolthoff, Kay L. And Hickman, Susan E. 'Compassion fatigue among nurses working with older adults'. *Geriatric Nursing* 20 (1), 2016, pp. 1 -4.
- 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.
- Krapow, Allan and Kelley, Jeff (eds.) *Essays on the Blurring of Art and Life*. Berkeley: UCP, 1993.
- 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].
- Kroon, Fred and Voltolini, Alberto 'Fictional Entities', *The Stanford Encyclopedia of Philosophy*, 2019, [Online]. Available at: <https://plato.stanford.edu/entries/fictional-entities/> [Accessed: 12th December 2018].
- Kuzmicová, Anežka 'Literary Narrative and Mental Imagery: A View from Embodied Cognition'. *Style* 48 (3), 2014, pp. 275 – 295.
- 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.
- LeDoux, Kathleen 'Understanding compassion fatigue: understanding compassion' *Journal of Advanced Nursing* 71 (9), 2015, pp. 2041 – 2050.
- Lewis, David *On The Plurality Of Worlds*. Oxford: Blackwell, 1986.
- Lewis, David Kellogg *Counterfactuals*. Harvard: Harvard University Press, 1986.
- Liu, Jiangang et al. 'Seeing Jesus in toast: Neural and behavioral correlates of face pareidolia'. *Cortex* 53 (1), 2014, pp. 60 – 77.
- Ljungberg, Christina 'Reading as mapping'. In: Tally, Robert T. Jr. (eds.) *The Routledge Handbook of Literature and Space*. London: Routledge, 2017. pp.95-105.
- Lotman, Yuri *The Structure of the Artistic Text*. Ann Arbor: University of Michigan Press, 1977.
- Mann, P.H. 'Surveying a Theatre Audience: Methodology Problems'. *British Journal of Sociology* 14 (4), 1966, pp. 380 – 387.
- 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.
- Margolin, Uri 'Introducing & Sustaining Characters in Literary Narrative: A Set of Conditions'. *Style* 21 (1) 1987, pp.107-124.
- Margolin, Uri 'Individuals In Narrative Worlds: An Ontological Perspective'. *Poetics Today* 11 (4), 1990, pp. 843 – 871.
- Margolin, Uri *Narrator*, 2014. [Online] Available from: <http://www.lhn.uni-hamburg.de/article/narrator> [Accessed 18th August 2018].
- Miall, David S. 'Anticipation and feeling in literary response: A neuropsychological perspective'. *Poetics* 23 (1), 1995, pp.275 – 298.
- Monahan, Seth *Mahler's Sonata Narratives*. [PhD Dissertation]. Connecticut: Yale University, 2008.
- 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.

- Murray, Donald M. 'Teaching The Other Self: The Writer's First Reader'. *College Composition and Communication* 33 (2), 1982, pp. 140-147.
- 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.
- Neithammer, Lutz *Posthistoire*. London: Verso, 1992.
- 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].
- Niederhoff, Burkhard 'Focalization, 2013 [Online]. Available at: <http://www.lhn.uni-hamburg.de/article/focalization> [Accessed: 18th August 2018].
- 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.
- Oatley, Keith 'Meeting of minds: Dialogue, sympathy and identification, in reading fiction'. *Poetics* 26 (1), 1999, p. 439 – 454.
- 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.
- Phelan, James *Reading People, Reading Plots: Character, Progression, and the Interpretation of Narrative*. Chicago: University of Chicago Press, 2012.
- Plato, Benjamin Jowett (trans.) *Ion: The Internet Classics Archive*, 2009 [Online]. Available at: <http://classics.mit.edu/Plato/ion.html> [Accessed: 18th August 2018].
- 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.
- Prince, Gerald *Reader*, 2013 [Online]. Available at: <http://www.lhn.uni-hamburg.de/article/reader> [Accessed: 8th August 2018].
- Propp, Vladimir *Morphology of the Folktale*. Texas: University of Texas Press, 1968.
- Rain, Marina *et al.* 'Adult attachment and transportation into narrative worlds'. *Personal Relationships* 24 (1), 2017, pp. 49 – 74.
- Rajewsky, Irina 'Intermediality, Intertextuality and Remediation: A Literary Perspective on Intermediality'. *Intermedialities* 6 (1), 2005, pp. 43–64.
- Richards, Ivor Armstrong *Practical Criticism*. London: Kegan Paul, Trench, Trubner, 1930.
- 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.
- Roser, Nancy *et al.* 'Characters As Guides To Meaning'. *The Reading Teacher* 60 (6), 2007, pp. 548 – 559.
- Rumelhart, David E. 'Notes on a Schema for Stories'. *Representation & Understanding* (1975), pp.211 – 236.
- Ryan, Marie-Laure 'Fiction as a Logical, Ontological and Illocutionary Issue'. *Style* 18 (2), 1984, pp. 121-139.
- Ryan, Marie-Laure 'Possible Worlds in Recent Literary Theory' *Style* 26 (4), 1992, pp. 528 – 553.
- Ryan, Marie Laure 'Possible-Worlds Theory'. In: Herman, David *et al.* (eds.) *The Routledge Encyclopedia of Narrative Theory*. London: Routledge, 2005, pp. 446-450.

Ryan, Marie-Laure 'Towards a definition of narrative'. In: Herman, David (eds.) *The Cambridge Companion To Narrative*. Cambridge: Cambridge University Press, 2007.

Ryan, Marie-Laure, 'Narratology and Cognitive Science: A Problematic Relation'. *Style* 44 (4), 2010, pp. 469 – 495.

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.

Ryan, Marie-Laure 'My Narratology: An Interview with Marie-Laure Ryan'. *Diegesis* 3 (1), 2014 [Online]. Available at: <https://www.diegesis.uni-wuppertal.de/index.php/diegesis/article/view/148/191> [Accessed 19th June 2020]. R

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.

Ryan, Marie-Laure *Avatars of Story*. Minnesota: University of Minnesota Press, 2006.

Ryan, Marie-Laure 'Kinds of Minds: On Alan Palmer's "Social Minds"'. *Style* 45 (4), 2011, pp. 654 – 659.

Ryan, Marie-Laure 'On The Worldness Of Narrative Representation' *Expanding Universes: Exploring Transmedial and Transfictional Ways of World-building International Conference*. Krakow, 2016.

Ryan, Marie-Laure *Storyworld across Media: Toward a Media-Conscious Narratology*. Nebraska: UNP, 2014.

Sayad, Cecilia 'Found-Footage Horror and the Frame's Undoing'. *Cinema Journal* 55 (2), 2016, pp. 43-66.

Schaeffer, Jean-Marie. *Pourquoi la fiction?* Paris: Seuil, 1999.

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.

Schneider, Ralf 'Toward a Cognitive Theory of Literary Character: The Dynamics of Mental-Model Construction'. *Style* 35 (4), 2001, pp. 607–639.

Schonert, Jorg *Author*, 2014 [Online]. Available at: <http://www.lhn.uni-hamburg.de/article/author> [Accessed 8th August 2018].

Schroder, Kim Christian 'Audience reception'. In: Napoli, Philip (eds.) *Mediated Communication*. Boston: De Gruyter, 2018, pp. 105 – 128.

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

Shklovskij, Viktor 'Art as Technique'. In: Rivkin, Julie and Michael, Ryan (eds.) *Literary Theory: An Anthology*. Malden: Blackwell Publishing, 1998.

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].

Slater, Barry *Aesthetics*, 2018 [Online]. Available at: <https://www.iep.utm.edu/aestheti/> [Accessed 8th August 2018].

Slatoff, Walter J *With Respect to Readers: Dimensions of Literary Response*. New York: Cornell University, 1970.

Stromer-Galley, Jennifer and Schiappa, Edward "The Argumentative Burdens of Audience Conjectures: Audience Research in Popular Culture Criticism". *Communication Theory* 8 (1), 2006, pp.27 – 62.

- Thomasson, Amie *Fiction and Metaphysics*. Cambridge: Cambridge University Press, 1999.
- Thon, Jan Noel 'Narrativity'. In: Ryan, Marie-Laure et al. (eds.), 2014, p. 351 – 355.
- Thon, Jan-Noël and Schroter, Flex 'Video Game Characters: Theory and Analysis'. *DIEGESIS* 40 (3), 2014.
- 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.
- Williams, Raymond *Marxism and Literature* Oxford: OUP, 1977, p. 155.
- Willis, Connie *Blackout*. USA: Ballantine, 2010.
- Wolf, Werner et al. *Metareference across media: theory and case studies*. Amsterdam: Rodopi, 2009.
- Wolf, Werner 'Aesthetic Illusion'. In: Wolf, Werner et al. *Immersion And Distance: Aesthetic Illusion in Literature and Other Media*. Amsterdam: Rodopi, 2013.

The Enlightenment, The 18th Century & knole's Historical Contexts

- Adorno, Theodore and Horkheimer, Max, *Dialectic of Enlightenment*. London: Verso, 1997.
- Aune, David Edward *Apocalypticism, prophecy and magic in early Christianity*. Tubingen: Mohr Siebeck, 2006.
- Beck, Larry and Cable, Ted *Interpretation for the 21st Century: Fifteen Guiding principles for Interpreting Nature and Culture*. US: Sports, 2002.
- Beck, Larry and Cable, Ted T. *The Gifts Of Interpretation*. Illinois: Sagamore, 2011.
- Bever, Edward *The Realities Of Witchcraft & Popular Magic in Early Modern Europe*. Basingstoke: Palgrave Macmillan, 2008.
- Borck, Cornelius 'Animism in the Sciences Then and Now'. *E-flux* 36 (1), 2012.
- Bristow, William 'The Enlightenment', *Stanford Encyclopedia of Philosophy*, 2017 [Online]. Available at: <https://plato.stanford.edu/entries/enlightenment/> [Accessed: 12th March 2020].
- Broadside Ballads Online*, 2020 [Online]. Available at: <http://ballads.bodleian.ox.ac.uk/> [Accessed: 20th May 2018].
- Brown, James et al. 'Histories From Within', *Inner Lives: Emotions, Identity and the Supernatural 1300 – 1900*, 2017 [Online]. Available at: <https://innerlives.org/about/> [Accessed: 20th June 2020].
- Burkert, Walter. *Greek Religion*. Cambridge: Harvard UP, 1985.
- Byrne, Patrick 'The Figure of Galileo'. *Loneragan Workshop* 22 (1), 2011, pp. 1 – 38.
- Cahan, David, (eds.) ed. (2003). *From Philosophy to the Sciences: Writing the History of Nineteenth-Century Science*. Chicago: University of Chicago Press, 2003.
- Cambers, Andrew 'Demonic Possession, Literacy and 'Superstition' in Early Modern England. *Past & Present* 202 (1), 2009, pp. 3 – 35.
- Carbonell, Bettina Messias 'Part IV: Histories and Identities in the Museum'. In: Carbonell, Bettina Messias, 2012.
- Clark, Stuart. *Thinking With Demons: The Idea Of Witchcraft In Early Modern Europe*. Oxford: Oxford University Press, 1999.
- Cook, Alan Edmond Halley: *Charting the Heavens and the Seas*. Oxford: Clarendon Press, 1998.

- 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.
- Curran, Emma 'Faces of nature: personification in women's romantic-age poetry'. [PhD Thesis]. University of Surrey, 2017.
- Cussen, Ollie 'The Trouble With with the Enlightenment'. *Prospect*, 2013 [Online]. Available at: <https://www.prospectmagazine.co.uk/magazine/the-enlightenment-and-why-it-still-matters-anthony-pagden-review> [Accessed: 12th March 2020].
- Davies, Owen. *Witchcraft, Magic and Culture 1736 – 1951*. Manchester: Manchester University Press, 1999.
- 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.
- Davies, Owen and De Bleacourt, Willem *Beyond the Witch Trials*. Manchester: Manchester University Press, 2004.
- Davies, Owen *Popular Magic: Cunning-folk in English history*. London: Hambleton Continuum, 2007.
- Davies, Owen 'Cunning-Folk in England and Wales during the Eighteenth and Nineteenth Centuries'. *Rural History* 8 (1), 2008.
- Davies, Owen, *Grimoires: A History of Magic Books*. Oxford: Oxford University Press, 2009.
- Davies, Owen 'Cunning-folk as abortionists in nineteenth-century England', *Perceptions of Pregnancy*, 2014 [Online]. Available at: <https://perceptionsofpregnancy.com/2014/12/14/cunning-folk-as-abortionists-in-nineteenth-century-england/> [Accessed: 20th January 2021].
- De Bleacourt, Willem, 'Witch doctors, soothsayers and priests. On cunning folk in European historiography and tradition'. *Social History* 19 (3), 1994, pp. 285 – 303.
- 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.
- Dean, Phyllis *The Industrial Revolution*. Cambridge: CUP, 2000.
- English, John C. "Dear Sister:" John Wesley and the Women of Early Methodism'. *Methodist History* 33 (1), 1994, pp. 26 – 34.
- Fairlie, Simon 'A Short History of Enclosure In Britain', *Hampton*, 2020 [Online]. Available at: <https://www.hamptonthink.org/read/a-short-history-of-enclosure-in-britain> [Accessed: 20th June 2020].
- Fulford, Tim *et al.* (eds.) *Literature, Science and Exploration in the Romantic Era*. Cambridge: CUP, 2010.
- Gaskill, Malcolm 'In Pursuit Of Reality: Recent Research into the History of Witchcraft'. *The Historical Journal* 51 (4), 2008, pp. 1069 – 1088.
- Ginsborg, Hannah 'Kant's Aesthetics and Teleology', *Stanford Encyclopedia of Philosophy*, 2013 [Online]. Available at: <https://plato.stanford.edu/entries/kant-aesthetics/> [Accessed: 20th March 2020].
- Goins, Elizabeth S. *et al.* 'Modding The Humanities: Experiments in Historic Narratives'. *Journal Of Interactive Humanities* 1 (1), 2013, pp.13-23.
- Gorodeisky, Keren '19th Century Romantic Aesthetics', *The Stanford Encyclopedia of Philosophy*, 2016 [Online]. Available at: <https://plato.stanford.edu/entries/aesthetics-19th-romantic/> [Accessed: 20th March 2019].
- Grant, Edward *Foundations of Modern Science in the Middle Ages*. Cambridge: CUP, 1996.

- Grier, Michelle 'Kant's Critique of Metaphysics', *Stanford Encyclopedia of Philosophy*, 2018 [Online]. Available at: <https://plato.stanford.edu/entries/kant-metaphysics/> [Accessed: 3rd December 2019].
- Hankins, Thomas L. *Science and the Enlightenment*. Cambridge: CUP, 2003.
- Haraway, Donna 'Tentacular Thinking: Anthropocene, Capitalocene, Chthulucene'. *E-flux* 75 (1), 2016.
- Hitt, Christopher 'Ecocriticism and the Long 18th Century'. *College Literature* 31 (3), 2004, pp. 123 – 147.
- 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.
- 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.
- Henry, John 'Magic and the origins of modern science' *The Lancet* 354 (1), 1999.
- Herrera, Cesar E Giraldo *Microbes and Other Shamanic Beings*. London: Palgrave Macmillan, 2018.
- Hill, Bridget (eds.) *Eighteenth Century Women: An Anthology*. Oxon: Routledge, 2013.
- 'Histories From Within', *Inner Lives*, 2015 [Online]. Available at: <https://innerlives.org/about/> [Accessed: 20th June 2020]. 1b
- Hitt, Christopher 'Toward an Ecological Sublime'. *New Literary History* 30 (3), 1999, pp. 603 – 623.
- Hodder, Ian and Hutson, Scott *Reading the Past: Current Approaches to Interpretation in Archaeology*. Cambridge: CUP, 2003.
- Hofmeyr, Murray 'From hauntology to a new animism? Nature and culture in Heinz Kimmerle's intercultural philosophy'. *The Journal For Transdisciplinary Research in Southern Africa* 3 (1), 2007, pp. 1 – 38.
- Hoggard, Brian et al. (eds.) *Transactions of the Hidden Charms Conference*. Norwich: Northern Earth Books, 2017.
- Hutton, Ronald *The Triumph of the Moon: A History of Modern Pagan Witchcraft*. New York: OUP, 1999, p. 84.. (eds.) *Transactions of the Hidden Charms Conference*. Norwich: Northern Earth Books, 2017.
- Inner Lives Project: *Histories From Within*, 2018 [Online]. Available at: <https://innerlives.org/about/> [Accessed 18th August 2018].
- Jenkins, Richard 'Disenchantment, Enchantment and Re-Enchantment'. *Max Weber Studies* 11 (1), 2000.
- Jobe, Thomas Harmon 'The Devil in Restoration Science: The Glanvill-Webster Witchcraft Debate'. *Isis* 72 (3), 1981.
- Josephson- Storm, Jason A. *The Myth Of Disenchantment: Magic, Modernity and the Birth of the Human Sciences*. London: University of Chicago Press, 2017.
- Josephson-Storm, Jason A. 'Against disenchantment', *Aeon*, 2019 [Online]. Available at: <https://aeon.co/essays/enlightenment-does-not-demand-disenchantment-with-the-world> [Accessed: 20th March 2018].
- 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.

- Kent, John 'The Enlightenment'. In: Byrne, Peter *et al.* (eds.) *Companion Encyclopedia of Theology*. London: routledge, 1995, pp. 251 – 271.
- Kiang, Tan Beng and Rahaman, Hafizur 'Virtual heritage: Reality and criticism'. In: Tidafi T. and Dorta, T. (eds.) *Joining Languages, Cultures and Visions: CAADFutures 2009*, 2009, pp. 143 – 156.
- Kim, Sung Ho 'Max Weber', *Stanford Encyclopedia of Philosophy*, 2017 [Online]. Available at: <https://plato.stanford.edu/entries/weber/> [Accessed 3rd December 2019].
- Llewellyn, Nigel and Riding, Christine 'British Art and the Sublime', *Tate*, 2013 [Online]. Available at: <https://www.tate.org.uk/art/research-publications/the-sublime/christine-riding-and-nigel-llewellyn-british-art-and-the-sublime-r1109418> [Accessed: 20th March 2020].
- Lloyd, Henry Martin 'Why the Enlightenment was not the age of reason', *Aeon*, 2018 [Online]. Available at: <https://aeon.co/ideas/why-the-enlightenment-was-not-the-age-of-reason> [Accessed: 12th March 2020].
- Lloyd, Henry Martin, 'Why intellectuals need to stop reminiscing about the Enlightenment as a golden 'age of reason'', *Scroll*, 2019 [Online]. Available at: <https://scroll.in/article/902708/why-intellectuals-need-to-stop-reminiscing-about-the-enlightenment-as-a-golden-age-of-reason> [Accessed: 12th March 2020].
- Luck, Georg *Arcana Mundi: Magic and the Occult in the Greek and Roman Worlds*. Baltimore: The Johns Hopkins University Press, 2006.
- MacDonald, Lindsay *Digital Heritage*, Oxford: Butterworth-Heinemann, 2006.
- Mack, Phyllis 'Does gender matter? Suffering and salvation in eighteenth-century Methodism'. *Bulletins of the John Rylands Library* 85 (2-3), 2003, pp. 157 – 176.
- Mackay, Robin 'Editorial Introduction'. *Collapse* 2 (1), 2012, pp. 3- 14.
- Magenat-Thalman, Nadia and Papagiannakis, George 'Recreating Daily Life In Pompeii'. *Virtual Archaeology Review* 1 (2), 2010, pp.16 – 20.
- Matelic, Candace Tangorra. 'Re-imagining heritage interpretation: enchanting the past-future'. *Museum Management & Curatorship* 29 (5), 2014 pp. 519-522.
- Mitzman, Arthur *The Iron Cage: Historical Interpretation of Max Weber*. London: Transaction, 1984.
- Mollmann, Bradley J. 'Healing with Demons? Preternatural Philosophy and Superstitious Cures in Spanish Inquisitorial Courts'. In: Bhayro, Siam and Rider, Catherine (eds.) *Demons and Illness from Antiquity to the Early-Modern Period*. and illnessP in17, pp. 396 – 411.
- Morse, Donald E. 'The Rise of Counterfactual History and the Permeability of Disciplines'. In: Limpar, Ildiko (eds.) *Displacing the Anxieties of Our World: Spaces of the Imagination*. Cambridge: Cambridge Scholars, 2017, pp. 10 – 25.
- 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=53b0bf4-74a6-4cfc-8379-1d55847c2cb9 [Accessed 18th August 2018].
- Nicolson, Marjorie Hope *Mountain Gloom and Mountain Glory: The Development of the Aesthetics of the Infinite*. London: University of Washington Press, 1997.
- Parry, Ross *Museums In The Digital Age*. Oxon: Routledge, 2010.
- The Proceedings of the Old Bailey*, 2018 [Online]. Available at: <https://www.oldbaileyonline.org/> [Accessed: 20th June 2020].
- Reill, Peter Hanns *Vitalizing Nature in the Enlightenment*. London: UCP, 2005.

- Rose-Millar, Charlotte 'Over-Familiar Spirits: The Bonds between English Witches and Their Devils'. In: Kounine, Laura and Ostling, Michael (eds.) *Emotions in the History of Witchcraft*. London: Palgrave Macmillan, 2016, pp. 173 – 189.
- Rochberg, Francesca 'Ina Lumun attali Sin: On Evil and Lunar Eclipses'. In: Van Buylaere, Greta et al. (eds.) *Sources of Evil: Studies in Mesopotamian Exorcistic Lore*. Leiden: Brill, 2018,.
- Rose-Millar, Charlotte 'Familiars'. In: Broomhall, Susan (eds.) *Early Modern Emotions: An Introduction*. London: Routledge, 2017, pp. 340 – 343.
- 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: Palgrave Macmillan, 2016, pp. 173 – 189.
- Rotenstreich, Nathan 'The Idea of Historical Progress and Its Assumptions'. *History and Theory* 10 (2), 1971, pp. 197 – 221.
- 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.
- Schama, Simon *Landscape And Memory*. London: Vintage, 1995.
- Shelley, James, 'The Concept of the Aesthetic', *Stanford Encyclopedia of Philosophy*, 2017 [Online]. Available at: <https://plato.stanford.edu/entries/aesthetic-concept/> [Accessed: 12th March 2020].
- Sherry, Patrick 'Disenchantment, re-enchantment, and enchantment'. *Modern Theology* 25 (3), 2009, pp. 369 – 386.
- Smethurst, Paul 'Natural Sublime and Feminine Sublime'. In: Smethurst, Paul *Travel Writing and the Natural World, 1768 – 1840*. London: Springer, 2012, pp. 153 – 170.
- Smith, George, 'Newton's *Philosophiae Naturalis Principia Mathematica*', *Stanford Encyclopedia of Philosophy*, 2007 [Online]. Available at: <https://plato.stanford.edu/entries/newton-principia/> [Accessed: 20th March 2020].
- Snobelen, Stephen David 'Lust, Pride and Ambition: Isaac Newton and the Devil'. In: Force, James E. and Hutton, Sarah (eds.) *Newton and Newtonianism*. London: Springer, 2004, pp. 155 – 181.
- Soll, Jacob 'The Culture of Criticism: What do we owe the Enlightenment?', *The New Republic*, 2015 [Online]. Available at: <https://newrepublic.com/article/121837/what-do-we-owe-enlightenment> [Accessed: 20th December 2019].
- Sollee, Kristen J. *Witches, Sluts, Feminists: Conjuring the Sex Positive*. Berkeley: Stone Bridge Press, 2017.
- 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].
- Steinfels, Peter S. 'Exploring Religion, Shaped by the Enlightenment', *The New York Times*, 2008 [Online]. Available at: <https://www.nytimes.com/2008/10/11/us/11beliefs.html> [Accessed: 12th March 2020].
- Stone, Alison 'Adorno and the disenchantment of nature'. *Philosophy and Social Criticism* 32 (2), 2006, pp. 231 – 253.
- Subbotsky, Eugene 'The Belief In Magic In The Age Of Science'. *SAGE Open* 4 (1), 2014.
- Sweet, Rosemary *Cities and the Grand Tour: The British in Italy, c. 1690 – 1820*. Cambridge: CUP, 2012.
- Tilden, Freeman *Interpreting Our Heritage*. North Carolina: University of North Carolina Press, 1957.

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

Suddaby, Roy *et al.* 'Craft, magic and the re-enchantment of the world'. *European Management Journal* 35 (3), 2017, pp. 285 – 296.

Tally Jr., Robert *et al.* (eds.) *Ecocriticism And Geocriticism: Overlapping Territories in Environmental and Spatial Literary Studies*.

Thompson, Edward Whigs and hunters: the origin of the black act. New York: Pantheon, 1975.

Trott, Nicola 'The Picturesque, the Beautiful and the Sublime'. In: Wu, Duncan (eds.) *A Companion to Romanticism*. New York: Wiley, 2017, pp. 79 – 98.

Townsend, Dabeny 'The picturesque'. *Journal of Aesthetics and Art Criticism* 55 (4), 1997, pp. 365 – 376.

Valley, Paul 'Religion vs science: can the divide between God and rationality be reconciled?'. Independent, 2008 [Online]. Available at: <https://www.independent.co.uk/news/science/religion-vs-science-can-the-divide-between-god-and-rationality-be-reconciled-955321.html> [Accessed: 12th December 2019].

Wallace, R 'The lie of the land': Ruskin and the English landscape tradition.', 1994.

Wilson, Tony *Understanding Media Users: From Theory To Practice*. New Jersey: Wiley-Blackwell, 2009.

White, Hayden 'Introduction: Historical Fiction, Fictional History, and Historical Reality'. *Rethinking History* 9 (2/3), 2005, pp.147 – 157.

Wigelsworth, Jeffrey R. *Deism in Enlightenment England*. Manchester: MUP, 2013.

Williams, Jeffrey H 'Science, science fiction and science fantasy'. In: Williams, Jeffrey H. *Order From Force*. London: IOP, 2015, pp. 1 – 7.

Williams, Rowan 'Magical thinking: the history of science, sorcery and the spiritual', *New Statesman*, 2016 [Online]. Available at: <https://www.newstatesman.com/culture/books/2016/01/magical-thinking-history-science-sorcery-and-spiritual> [Accessed: 20th June 2020].

Williams, Sarah F. *Damnable Practises: Witches, Dangerous Women, and Music in Seventeenth-Century English Broadside Ballads*. Surrey: Askgate, 2015.

Wilson, James Matthew *The Vision Of The Soul. Washington D.C.: The Catholic University of America Press, 2017*.

Wilson, Duncan 'Public Asked To Help Hunt For Witches' Marks', *Historic England*, 2016 [Online]. Available at: <https://historicengland.org.uk/whats-new/news/help-hunt-for-witches-marks> [Accessed: 12th March 2020].

Computational Art

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

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.

Aarseth, Espen. 'A Narrative Theory of Games' *Foundation of Digital Games 2015*, 2015, pp. 1–5.

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].

- 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.
- Albor, Jorge 'Journey' As Ritual', *PopMatters*, 2014 [Online]. Available at: <https://www.popmatters.com/180290-journey-as-ritual-2495672787.html> [Accessed: 7th May 2015].
- 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].
- 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].
- Ali, Umran 'Red Dead Redemption 2: Virtual ecology is making game worlds eerily like our own', *The Conversation*, 2018 [Online]. Available at: <https://theconversation.com/red-dead-redemption-2-virtual-ecology-is-making-game-worlds-eerily-like-our-own-107068> [Accessed: 20th October 2019].
- Andrews, Jimmy and Schmidt, Loren *Realistic Kissing Simulator* [Online]. Available at: <http://jimmylands.com/experiments/kissing/> [Accessed 8th August 2018].
- 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.
- Anthropy, Anna and Clark, Naomi *A Game Design Vocabulary: Exploring The Foundational Principles Behind Good Game Design*. Boston: Addison-Wesley, 2014.
- Appleton, Conor and Morris, Jake 'Scaling Skyrim – a case study on the population of Solstheim'. *Journal of Interdisciplinary Science Topics*, 2018.
- 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].
- Arsenault, Dominic and Perron, Bernard 'In The Frame of the Magic Cycle: The Circle(s) of Gameplay'. In: Perron, Bernard and Wolf, Mark J.P. (eds.) *The Video Game Theory Reader 2*. London: Routledge, 2008, pp. 109 – 133.
- 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].
- 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.
- Bailey, Christine *et al.* 'Believability Through Psychosocial Behaviour: Creating Bots That Are More Engaging and Entertaining'. In: Hingston, Peter (eds.) *Believable Bots*. Berlin: Springer, 2012, pp. 29 – 70.
- Banks, John 'Co-creating Videogames' London: Bloomsbury, 2013.
- 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.
- Barriga, Silviano Diaz *et al.* 'Emotional Attention in Autonomous Agents: a Biologically Inspired Model'. *Proceedings of the 2012 International Conference on Cyberworlds*. Darmstadt, 2012.
- Batchelor, 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].

- Behrenhausen, Bryan G 'The active audience, again: Player-centric game studies and the problem of binarism'. *New Media and Society* 15 (6), 2013, pp. 872 – 889.
- Bell, Alice *The Fuckeduplet 1: Dialogue in Games is Fucked - Alice Bell*. Videobrain, London, 2016 [Online]. Available at: <https://www.youtube.com/watch?v=nWD6bb3AbS8> [Accessed: 8th August 2018].
- 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.
- Bethesda Softworks *The Elder Scrolls V: Skyrim*. [PC Software] US: Bethesda Softworks, 2011.
- Bickmore, Timothy *et al.* *Proceedings Of The 14th International Conference on Intelligent Virtual Agents*. Boston: IVA, 2014.
- Bithell, Mike *Thomas Was Alone*. [PC Software] UK: Mike Bithell, 2012.
- Baldwin, Kai 'Animal Representation in Video Games', *Animal Instances*, 2019 [Online]. Available at: <https://animalinstances.com/?p=6527> [Accessed: 20th July 2019].
- 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.
- Banks, Jaime *et al.* *100 Greatest Video Game Characters*. Maryland: Rowman & Littlefield, 2017.
- Bartle, Richard 'Virtual worlds: Why people play'. In: Alexander, Thor (eds.) *Massively Multiplayer Game Development: v.2*. Massachusetts: Charles River Media, 2005.
- Barton, Matt 'How's The Weather: Simulating Weather in Virtual Environments'. *Game Studies* 8 (1), 2008.
- Batchelor, James 'Like a boss: The secrets behind great boss design', *gamesindustry.biz*, 2019 [Online]. Available at: <https://www.gamesindustry.biz/articles/2019-08-13-like-a-boss-the-secrets-behind-great-boss-design> [Accessed 20th July 2020].
- 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].
- The best open world games | PC Gamer*, 2018 [Online]. Available at: <https://www.pcgamer.com/best-open-world-games/> [Accessed 8th August 2018].
- Bogdanovych, Anton 'What makes virtual agents believable?' *Connection Science* 28 (1), 2016, pp. 83 – 108.
- Boechler, Patricia. 'How Spatial Is Hyperspace? Interacting with Hypertext Documents: Cognitive Processes and Concepts'. *Cyberpsychology & Behavior* 4 (1), 2001, pp. 23 – 48.
- Bolter, Jay David 'Augmented Reality'. In: Ryan, Marie-Laure *et al.* (eds.) *The John Hopkins Guide To Digital Media*. Baltimore: The John Hopkins University Press, 2014.
- Bogost, Ian 'Persuasive Games: The Expressive Power of Videogames'. Massachusetts: The MIT Press, 2007.
- 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].
- Bogost, Ian *Proteus: A Trio of Artisanal Game Reviews*, 2013 [Online]. Available at: <http://bogost.com/writing/proteus/> [Accessed: 8th August 2018].
- 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].

- Bogost, Ian *How To Talk About Videogames*. Minneapolis: University of Minnesota Press, 2015.
- Bogost, Ian, *Story vs. System*, Critical Path, 2016 [Online]. Available at: <https://www.criticalpathproject.com/video/story-vs-system/> [Accessed: 20th June 2020]. c
- Bogost, Ian 'Video Games Are Better Without Stories'. *The Atlantic*, 2017 [Online]. Available at: <https://www.theatlantic.com/technology/archive/2017/04/video-games-stories/524148/> [Accessed: 20th Jan 2017].
- Bogost, Ian 'Video games remind us that not everything in life has a computable answer', *Quartz*, 2018 [Online]. Available at: <https://qz.com/1433042/video-games-remind-us-that-not-everything-in-life-has-a-computable-answer/> [Accessed: 20th June 2020].
- 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].
- Bosman, Frank G. 'I Have Faith in Thee, Lord: Criticism of Religion and Child Abuse in the Video Game the Binding of Isaac'. *Religions* 9 (4), 2018.
- Bourgonjon, Jeroen 'The Meaning and Relevance of Video Game Literacy'. *Comparative Literature & Culture* 16 (5), 2014.
- Bown, Oliver *et al.* 'The Machine As Autonomous Performer'. In: Candy, Linda and Ferguson, Sam (eds.) 2014.
- Bozdog, Mona and Galloway, Dayna 'Performing walking sims: From *Dear Esther* to *Inchcolm Project*'. *Journal of Gaming & Virtual Worlds* 12 (1), 2020, pp. 23 – 47.
- Brazeal, Cynthia *Designing Sociable Robots*. Massachusetts: The MIT Press, 2002.
- Brice, Mattie *Death of the Player*, 2013 [Online]. Available at: <http://www.mattiebrice.com/death-of-the-player/> [Accessed 8th August 2018].
- Brice, Mattie 'KILL THE PLAYER', *Mattie Brice*, 2015 [Online]. Available at: <http://www.mattiebrice.com/kill-the-player/> [Accessed: 22nd October 2020].
- 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.
- Brooks, Rodney 'Intelligence Without Representation'. *Artificial Intelligence* 47 (1-3), 1991, pp. 139 – 159.
- Brough, Melissa 'Participatory Culture'. In: Ryan, Marie-Laure *et al.* (eds.), 2014, pp. 382 – 387.
- Brouchoud, Jon 'The Importance of Architecture in Video Games and Virtual Worlds', *Arch Virtual*, 2013 [Online]. Available at: <https://archvirtual.com/2013/02/09/the-importance-of-architecture-in-video-games-and-virtual-worlds/> [Accessed: 20th June, 2020].
- 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.
- 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
- Bryson, Joanna J. 'The Behavior-Oriented Design of Modular Agent Intelligence'. In: Kowalszyk, R. *et al.* (eds.) *Agent Technologies, Infrastructures, Tools, and Applications for e-Services*. London: Springer, 2003, pp. 61–76.
- Bryson, Joanna 'The Use of State in Intelligent Control', 2006 [Online]. Available at: <http://www.cs.bath.ac.uk/%7Ejbb/ftp/sab96.pdf> [Accessed 19th June 2020]

Bryson, Joanna J. 'The Impact of Durative State on Action Selection'. *Proceedings of the AAAI 2008 Spring Symposia*. AAAI, 2008.

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.

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].

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.

Calleja, Gordon 'Experiential Narrative In Game Environments'. *Proceedings of the DiGRA 2009 Conference*. DiGRA, 2009.

Calleja, Gordon 'Narrative generation in Lord of the Rings Online' In: Krzywinska, Tanya *et al.* (eds.) *Ring bearers: the Lord of the Rings online as intertextual narrative*. Manchester: MUP, 201

Calleja, Gordon *In-Game: From Immersion to Incorporation*. London: MIT Press, 2011.

Calleja, Gordon 'Narrative Involvement in Digital Games'. *Conference proceedings from Foundations of Digital Games*. Chania, Crete, Greece. FDG, 2013, p.2 .

Cameron, Andy *Dissimulations: Illusions of Interactivity*, 1995 [Online]. Available at: <http://infotyte.rmit.edu.au/rebecca/html/dissimulations/> [Accessed 8th August 2018].

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

Campbell, Jim *Portfolio (Installations)*, 2018 [Online]. Available at: <http://www.jimcampbell.tv/portfolio/installations/> [Accessed 8th August 2018].

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

Candy, Linda and Ferguson, Sam (eds.) *Interactive Experience in the Digital Age*. London: Springer, 2014.

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.

Carson, Don 'Environmental Storytelling: Creating Immersive 3D Worlds Using Lessons Learned from the Theme Park industry', *Gamasutra*, 2000 [Online]. Available at: http://www.primitive-eye.com/pdf_files/Environmental_storytelling_pt1.pdf [Accessed: 20th June 2020].

Cassar, Robert 'God of War: A Narrative Analysis'. *Eludamos* 7 (1), 2013, pp. 81-99.

Cășvean, Tulia Maria 'What is Games Studies Anyway? Legitimacy of Game Studies Beyond Ludo-centrism vs. Narrato-centrism Debate'. *Revista Româna de Jurnalism și Comunicare* 11 (1), 2016, pp. 48 – 59.

Chapman, Adam. *Digital games as history: How videogames represent the past and offer access to historical practice*. London: Routledge, 2016.

Champion, Erik 'Applying game design theory to virtual heritage environments'. *Proceedings of the 1st international Conference on Computer graphics and interactive techniques in Australasia and South East Asia*, 2003, pp. 273 – 274.

Champion, Erik Malcolm 'Evaluating Cultural Learning in Virtual Environments'. [PhD Thesis]. The University of Melbourne, 2006, p. 57.

- 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.
- Champion, Erik 'Otherness of Place: Game-based Interaction and Learning in Virtual Heritage Projects'. *International Journal of Heritage Studies* 14 (3), 2008, pp. 210 – 228.
- Champion, Erik and Dekker, Andrew 'Biofeedback and Virtual Environments'. *International Journal of Architectural Computing* 9 (4), 2011, pp. 377 – 396.
- Champion, Erik *Game Mods: Design, Theory and Criticism*. Australia: ETC Press, 2012.
- Champion, Erik 'Roleplaying And Rituals For Cultural Heritage-Oriented Games'. Proceedings of DiGRA 2015: Diversity of Play: Games – Cultures – Identities. DiGRA, 2015.
- Champion, Erik 'Defining Cultural Agents for Virtual Heritage Environments'. *Presence* 24 (5), 2015, pp.179 – 186.
- Champion, Erik 'Introduction to Virtual Heritage' In: Gillam R. And Jacobson, J. (eds.) *The Egyptian Oracle Project: Ancient Ceremony in Augmented Reality*. London, Bloomsbury, 2015.
- Champion, Erik *Critical Gaming: Interactive History and Virtual Heritage*. London: Routledge, 2016.
- Champion, Erik 'A 3D Pedagogical Heritage Tool Using Game Technology'. *Mediterranean Archaeology and Archaeometry* 16 (5), 2016, pp. 63 – 72.
- Champion, Erik 'Worldfulness, Role-enrichment & Moving Rituals' *Transactions of the Digital Games Research Association* 2 (3), 2016, pp. 117 – 143.
- Champion, Erik 'Norberg-Schulz – Culture, Presence and a Sense of Virtual Place' In: Champion, Erik (eds.) *The Phenomenology of Real and Virtual Places*. London: Routledge, 2018
- 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.
- Chang, Alenda Y. 'Playing The Environment: Games as Virtual Ecologies'. *UC Irvine: Digital Arts & Culture*, 2009 [Online]. Available at: <https://escholarship.org/uc/item/46h442ng#author> [Accessed: 20th June 2020].
- Chang, Alenda Y. 'Playing Nature: The Virtual Ecology of Game Environments' [PhD Thesis]. California: University of California, Berkeley, 2013.
- Cheng, Ian *iancheng*, 2018 [Online]. Available at: <http://iancheng.com/> [Accessed 8th August 2018].
- Cheng, Ian *BOB (Bag Of Beliefs)*, 2020 [Online]. Available at: <http://iancheng.com/BOB> [Accessed 19th March 2020].
- Chiapello, Laureline 'Epistemological Underpinnings in Game Design Research'. In: Lankoski, Peter and Holopainen, J. (eds.) *Game Design Research: An Introduction to Theory & Practice*. USA: Carnegie Mellon University ETC Press, 2017, pp.16 -33.
- The Chinese Room *Everybody's Gone To The Rapture*. UK: Sony, 2015.
- Christy, Thomas and Kuncheva, Ludmila I. 'Technological Advancements in Affective Gaming: A Historical Survey'. *GSTF International Journal on Computing* 3 (4), 2014, pp. 32 – 42.
- Ciccoricco, David 'Games as Art/Literature'. In: Ryan, Marie-Laure *et al.* (eds.), 2014, pp. 220 - 224.
- Connell, Jonathan 'A Colony Architecture for an Artificial Creature' [Technical Report]. Boston: MIT, 1989.
- 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.

- Costikyan, Greg 'I Have No Words & I Must Design: Toward A Critical Vocabulary for Games'. *Proceedings of the Computer Games and Digital Cultures Conference*, 2002, pp. 9 – 33.
- Couillard, Jeremy *jeremy c*, 2018 [Online]. Available at: <http://www.jeremycouillard.com/> [Accessed: 8th August 2018].
- Cowley, Ben *et al.* 'Towards an understanding of flow in video games'. *Computers In Entertainment* 6 (2), 2008, pp. 20:1 – 20:27.
- Crawford, Chris *Art of Computer Game Design*. New York: McGraw-Hill, 1984.
- Crawford, Chris *Chris Crawford: don't die, 2015* [Online]. Available at: <http://www.nodontdie.com/chris-crawford/> [Accessed: 8th August 2018].
- Crawford, Chris *Chris Crawford on Interactive Storytelling*,, UA: New Riders, 2012.
- Creative Assembly *Alien: Isolation* [PC Software]. UK: Sega, 2014.
- Cremin, Colin *Exploring Videogames with Deleuze and Guattari*. London: Routledge, 2016.
- Cross, Katherine 'Opinion: Why does *Mass Effect: Andromeda*'s open world feel so closed?', *Gamasutra*, 2017 [Online]. Available at: https://www.gamasutra.com/view/news/296319/Opinion_Why_does_Mass_Effect_Andromeda_as_open_world_feel_so_closed.php [Accessed: 20th June 2020].
- Cses, Llogari *et al.* 'Multi-reality games: an experience across the entire reality-virtuality continuum'. *Proceedings of the 16th ACM SIGGRAPH International Conference on Virtual-Reality Continuum and its Applications in Industry*, 2018, pp. 1 – 4.
- Dani, Ninad Janardan 'Impact of Virtual Reality on Gaming'. *International Research Journal of Engineering and Technology* 6:12 (2019), pp. 2033 – 2037.
- 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.
- De Wildt, Lars *Enstranging Play: Distinguishing Playful Subjecthood from Governance*, 2014 [Online]. Available at: https://gamephilosophy.org/wp-content/uploads/confmanuscripts/pcg2014/de-Wildt-2014.-Enstranging-Play_-Distinguishing-Playful-Subjecthood-from-Governance.-PCG2014.pdf [Accessed: 12th December 2019].
- De Wildt, Lars 'Playing The Other: Role-playing religion in videogames'. *European Journal of Cultural Studies* 21 (3), 2018.
- Devine, Kit 'testing times: Virtual heritage, 'time travel' and the user experience of museum visitors: a case study of an enriched time-based virtual heritage world'. [PhD Thesis]. The Australian National University, 2016.
- Dias, Bruno 'Guest Column: A Garden of Bodies', *GiantBomb*, 2016 [Online]. Available at: <https://www.giantbomb.com/articles/guest-column-a-garden-of-bodies/1100-5428/> [Accessed: 20th July 2019].
- 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.
- Douglas, Dante 'A House of Teeth: On ANATOMY', 2016 [Online]. Available at: <https://medium.com/@videodante/a-house-of-teeth-on-anatomy-b5139ed2f6a0> [Accessed: 20th July 2020].
- Doyle, Denise 'Immersive storytelling in mixed reality environments'. *Proceedings of the 23rd International Conference on Virtual System and Multimedia (VSMM)*. Dublin: IEEE, pp. 1-4.

- Dragoni, Aldo Franco 'A MODEL FOR BELIEF REVISION IN A MULTI-AGENT ENVIRONMENT'. *ACM SIGOIS Bulletin* 13 (3), 1992.
- Dreher, Thomas *History of Computer Art*, 2015 [Online]. Available at: http://iasl.uni-muenchen.de/links/GCA_Indexe.html [Accessed 8th August 2018].
- Dubbelman, Teun *et al.* 'Interactive Digital Narratives (IDN) for Change'. *Proceedings of the ICIDS 2018*, 2018, pp. 591 – 602.
- Duncan, Alex 'Savage Beasts: The Spatial Conflict Between Civilization and Nature in The Elder Scrolls V: Skyrim', *First Person Scholar*, 2018 [Online]. Available at: <http://www.firstpersonscholar.com/savage-beasts/> [Accessed: 20th January 2021].
- Dyer-Witheford, Nick and de Peuter, Grieg *Games Of Empire: Global Capitalism And Video Games*. Minnesota: University of Minnesota Press, 2009.
- Ellenberge, Kate 'Virtual and Augmented Reality in Public Archaeology Teaching'. *Advances in Archaeological Practice* 5 (3), 2017, pp.305- 309.
- Elson, David 'Artificial Intelligence'. In: Ryan, Marie-Laure *et al. (eds.)*, 2014, pp. 18 – 22.
- 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.
- Eskenlinen, Markku 'The Gaming Situation'. *Game Studies* 1 (1), 2001.
- Evans, Richard 'Representing Personality Traits as Conditionals'. *Proc. Artif. Intell. Simul. Behav.*, 2008, pp. 64-82.
- 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.
- Fernandez-Vara, Clara *et al.* 'Evolution of Spatial Configurations in Videogames'. In: De Castell, Suzanne and Jenson, Jennifer (eds.) *Worlds in Play: International Perspectives on Digital Games Research*. New York: Peter Lang, 2007.
- Fernandez-Vara, Clara, 'Play's The Thing: A Framework to Study Videogames as Performance'. [Paper], 2009.
- Fernandez-Vara, Clara 'Game Spaces Speak Volumes: Indexical Storytelling' *Proceedings of DiGRA 2011 Conference: Think Design Play* (2011).
- Finn, Ed *What Algorithms Want: Imagination in the Age of Computing*. Massachusetts: The MIT Press, 2017.
- Fizek, Sonia 'The death of the player: videogames and post-humanism'. *Proceedings of the Beyond Humanism Conference*. Poland, 2018, pp. 30 – 31.
- Flanagan, Mary *Critical Play: Radical Game Design*. Massachusetts: The MIT Press, 2009.
- Fogg, B.J. and Tseng, Shawn 'Credibility and Computing Technology'. *Communications of the ACM* 42 (5), 1999, pp.39 – 45.
- Frasca, Gonzalo 'Rethinking agency and immersion: video games as a means of consciousness-raising'. *Digital Creativity* 12 (1), 2001, pp. 167 – 174.
- Frasca, Gonzalo 'Simulation versus Narrative: Introduction to Ludology'. In: Wolf, Mark and Perron, Bernard (eds.) *The Video Game Theory Reader*. New York: Routledge, 2003.
- 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].

- Frude, Neil and Jandric, Petar 'The Intimate Machine – 30 Years On'. *E-Learning & Digital Media* 12 (3-4), 2015, pp. 410 – 424.
- Fuller, Matthew 'Data'. In: Ryan, Marie-Laure *et al.* *The John Hopkins Guide To Digital Media*. Baltimore: The John Hopkins University Press, 2014.
- Fullerton, Tracy *et al.* *Walden: A Game* [PC Software]. US: USC Games, 2017.
- Gard, Toby *Building Character*, 2000 [Online]. Available at: <https://www.scribd.com/document/321423675/Toby-Gard-2000-Building-Character> [Accessed 8th August 2018].
- Galloway, Alexander R *Gaming: Essays in Algorithmic Culture*. London: University of Minnesota Press, 2006.
- Gaver, William *et al.* 'Ambiguity as a Resource for Design' *Proceedings Of CHI '03*, 2003.
- Gazzard, Alison 'Unlocking the Gameworld: The Rewards of Space and Time in Videogames'. *Game Studies* 11 (1), 2011.
- Gemeinboeck, Petra *et al.* 'Uzume', EVL, 2000 [Online]. Available at: <https://www.evl.uic.edu/core.php?mod=4&type=1&indi=194> [Accessed: 19th March 2019].
- 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.
- 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].
- Glynn, Ruairi 'Edward Ihnatowicz – The Senster', 2008 [Online]. Available at: <http://www.interactivearchitecture.org/edward-ihnatowicz-the-senster.html> [Accessed 8th August 2018].
- Goldberg, Ken *The Whole Cinemagillah*. National Museum of Jewish History, Pennsylvania, 2017.
- Goldstein, Jeffrey 'Emergence as a Construct: History and Issues' *Emergence* 1 (1), 1999, pp. 49 – 72.
- 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.
- 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.
- Grau, Oliver *Virtual Art: From Illusion To Immersion*. London: The MIT Press, 2003.
- Graham, Shawn *Writing History With Interactive Fiction*, 2010 [Online]. Available at: <http://www.playthepast.org/?p=68> [Accessed: 8th August 2018].
- Granstom, Helena 'Elements in Games for Virtual Heritage Applications' [Master Degree Thesis]. University of Skovde, 2013.
- 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.
- Gregerson, A.L. and Grodal, T 'Embodiment and Interface'. In: *The Video Game Theory Reader 2*. London: Routledge, 2009.
- Grier, David Alan. *When Computers Were Human*. Oxford: Princeton University Press, 2005.

- 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.
- Hancock, Michael *Games with Words: Textual Representation in the Wake of Graphical Realism in Videogames*. [PhD Thesis]. Canada: University of Waterloo, 2016.
- Hansen, Mark *Bodies In Code: Interfaces with Digital Media*. London: Routledge, 2006.
- Harnad, Stevan 'Minds, machines and Searle'. *Journal of Experimental and Theoretical Artificial Intelligence*. 1 (1), 1989, pp. 5 – 25.
- 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].
- Harris, Terry and Gittens, Curtis 'Modeling believable agents using a descriptive approach'. *Biologically Inspired Cognitive Architectures* 14 (1), 2015, pp.10 -21.
- Haverinen, Anna *Digital Death: Online Mourning Rituals and Practises*. London: Routledge, 2017.
- Hayles, Katherine 'Print Is Flat, Code Is Deep: The Importance of Media-Specific Analysis'. *Poetics Today* 25 (1), 2004, pp.67 – 90.
- Hayot, Eric and Wesp, Edward 'Towards a Critical Aesthetic of Virtual-World Geographies'. *Game Studies* 9 (1), 2009.
- Hecker, Chris *The Word 'Game'*, 2016 [Online]. Available at: <http://www.criticalpathproject.com/video/chris-hecker-the-word-game/> [Accessed: 8th August 2018].
- 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.
- Heidibrink, Simone *et al.* 'Theorizing Religion in Digital Games. Perspectives and Approaches'. *Online Heidelberg Journal of Religions on the Internet* 5 (1), 2014.
- 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.
- Helton, J. W. 'Systems with infinite-dimensional state space': The Hilbert space approach'. *Proceedings of the IEEE* 64 (1), 1976, pp.145 – 160.
- Henaghan, Lee 'Shadow of the Colossus puts the awe back into awesome', *stuff.nz*, 20198 [Online]. Available at: <https://www.stuff.co.nz/entertainment/games/101556383/shadow-of-the-colossus-puts-the-awe-back-into-awesome> [Accessed: 20th July 2020]. 'living levels'
- Herath, Damith *et al.* (eds.) *Robots and Art: Exploring an Unlikely Symbiosis*. London: Springer, 2016
- 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].
- Hingston, Philip (eds.) *Believable Bots: Can Computers Play Like People?* Heidelberg: Springer, 2012.
- Hirschman, Jacob *Geography of Skyrim*, 2012 [Online]. Available at: <https://geoskyrim.blogspot.com> [Accessed 8th August 2018].
- 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].

- 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].
- Hofstadter, Douglas, *Godel, Escher, Bach: An Eternal Golden Braid*. London: Penguin, 2000.
- Holloway-Attaway, Lissa 'Artgames: Playing with Material Boundaries and Staking Claims' [Online]. Available at: <https://www.diva-portal.org/smash/get/diva2:1068196/FULLTEXT01.pdf> [Accessed: 20th September 2020].
- 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.
- Hruska, Joel *The Quest To Improve Videogame AI*, 2016 [Online]. Available at: <https://www.magzter.com/articles/1642/143107/56a26114033e9> [Accessed 8th August 2018].
- Huizinga, Johan. *Homo Ludens*. Boston: The Beacon Press, 1955.
- Hugill, Andrew and Yang, Hongi 'The creative turn: New challenges for computing'. *International Journal of Creative Computing* 1 (1), 2013, pp. 1 – 15.
- Humphrys, Mark *How my program passed the Turing Test*, 2008 [Online]. Available at: <http://computing.dcu.ie/~humphrys/Turing.Test/o8.chapter.html> [Accessed 8th August 2018].
- Hunicke, Robin *et al.* 'MDA: A Formal Approach to Game Design and Game Research'. In: *Proceedings of the Challenges in Games AI Workshop, Nineteenth National Conference of Artificial Intelligence*. 2004, pp. 1-4.
- Hynes, Gerard 'Locations and Borders'. In: Wolf, Mark J.P. (eds.) *The Routledge Companion to Imaginary Worlds*. London: Routledge, 2017.
- 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.
- Id Software *DOOM 3*. [PC Software] US: Activision, 2004.
- Inderwildi, Andreas, 'The Secret Lives of Video Game Animals', *Kotaku UK*, 2019 [Online]. Available at: <https://web.archive.org/web/20180914212304/https://www.kotaku.co.uk/2018/02/23/the-secret-lives-of-video-game-animals> [Accessed: 20th June 2020].
- Iversen, Sara Mosberg. 'Between Regulation and Improvisation: Playing and Analysing "Games in the Middle"'. [PhD Thesis]. IT University of Copenhagen, 2009.
- Jammer, Max *Concepts of Space: The History of Theories of Space in Physics*. US: Dover, 1993.
- 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].
- Jenkins, Hannah, 'My boyfriend came back from the war'. *The Lifted Brow* 44, 2019, pp. 38 – 32.
- 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.
- 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].
- Jenkins, Henry 'Transmedia storytelling' *Volume 1* (1), 2009.
- Jennings, Stephanie C. 'Passing As Method: Subjectivity in Video Games Criticism'. *Journal of Games Criticism* 2 (1), 2015.

Jennings, S. C. 'Co-Creation and the Distributed Authorship of Video Games'. In: Valentine, K. D., & Jensen, L. J. (eds.), *Examining the Evolution of Gaming and Its Impact on Social, Cultural, and Political Perspectives* Pennsylvania: IGI, 2016, pp. 123-146.

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].

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].

Jonne, Arjoranta 'Interpretive Challenges In Games'. Proceedings of the 2018 DiGRA International Conference: The Game is the Message, DiGRA, 2018 [Online]. Available at: <http://www.digra.org/digital-library/publications/interpretive-challenges-in-games/> [Accessed: 20th June 2020].

Juul, Jesper 'Games telling Stories? A brief note on games and narratives'. *Game Studies* 1 (1), 2001.

Kahurlahti, Veli-Matti 'Defining The Videogame'. *Game Studies* 15 (2), 2015, [Online]. Available at: <http://gamestudies.org/1502/articles/karhulahti> [Accessed 8th August 2018].

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].

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].

Keogh, Brendan, 'My Own 2014', *Brendan Keogh*, 2014 [Online]. Available at: <https://brkeogh.com/2014/12/28/my-own-2014/> [Accessed: 15th June, 2019].

Keogh, Brendan 'On video game criticism', *Overland*, 2014 [Online]. Available at: <https://overland.org.au/previous-issues/issue-214/feature-brendan-keogh/> [Accessed: 12th December 2019].

Keogh, Brendan *On The Beginner's Guide*, 2015 [Online]. Available at: <https://brkeogh.com/2015/10/03/on-the-beginners-gude/> [Accessed: 8th August].

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].

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].

Keogh, Brendan 'Notes on No Man's Sky', Brendan Keogh, 2016 [Online]. Available at: <https://brkeogh.com/2016/08/21/notes-on-no-mans-sky/> [Accessed: 30th June 2019].

Keogh, Brendan *A Play of Bodies: How We Perceive Videogames*. Massachusetts: The MIT Press, 2018.

Keogh, Brendan, 2018 [Online]. Available at: <https://mitpress.mit.edu/books/play-bodies> [Accessed: 8th August 2018].

Kerr, Aphra. *The business and culture of digital Games: Gamework/gameplay*. London: Sage, 2006.

Khandaker-Kokokoris, Mitu 'An empirical exploration of aesthetic distance through mimetic interface design in videogames'. [PhD Thesis]. University of Portsmouth, 2015.

Kidd, Cory *et al.* 'Effect of a robot on user perceptions'. *Proceedings of IROS 2004*: Sendai, 2004.

- 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].
- Kim, Hanhwe and Hirtle, Stephen. 'Spatial metaphors and disorientation in hypertext browsing'. *Behaviour & Information Technology* 14 (4), 1995, pp. 239 – 250.
- Kim, Amy Jo 'Gamification 101: Designing The Player Journey', Google Tech Talks, 2011 [Online]. Available at: <https://www.youtube.com/watch?v=BoH3ASbnZmc> [Accessed: 19th June 2020].
- Kirkpatrick, Graeme 'Video Game Image: The aesthetic character of digital gaming'. *In:*
- Klevjer, Rune 'Graphical Realism'. *In:* Ryan, Marie-Laure *et al. (eds.)*, 2014, pp. 241 – 245.
- Klevjer, Rune 'Cut Scenes'. *In:* Ryan, Marie-Laure *et al. (eds.)*, 2014.
- Knoller, Noam and Ben-Arie, Udi 'The Holodeck is all Around Us – Interface Dispositifs in Interactive Digital Storytelling' *In:* Koenitz, Hartmut *et al. (eds.)*, 2015, pp. 51 – 66.
- Koenitz, Hartmut 'Towards A Theoretical Framework for Interactive Digital Narrative'. *Proceedings of the Third Joint Conference on Interactive Digital Storytelling, ICIDS: Edinburgh, 2010.*
- Koenitz, Hartmut *et al.* 'Introduction: Perspectives On Interactive Digital Narrative'. *In:* Koenitz, Hartmut *et al. (eds.)*, 2015, pp. 1 - 8.
- Koenitz, Hartmut *et al.* 'Introduction: The Evolution of Interactive Digital Narrative Theory'. *In:* Koenitz, Hartmut *et al. (eds.)*, 2015, pp. 67 – 76.
- 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.
- Koenitz, Hartmut *et al.* 'Introduction: A Concise History of Interactive Digital Narrative'. *In:* Koenitz, Hartmut *et al. (eds.)*, 2015, pp. 9 - 21.
- Koenitz, Hartmut *et al.* 'Introduction: Beyond the Holodeck: A Speculative Perspective on Future Practices'. *In:* Koenitz, Hartmut *et al. (eds.)*, 2015, pp. 151 – 158.
- Koenitz, Hartmut *et al. (eds.) Interactive Digital Narrative: History, Theory and Practice*. London: Routledge, 2015.
- Koenitz, Hartmut and Louchart, Sandy 'Practicalities and Ideologies: (Re)-Considering the Interactive Digital Narrative Authoring Paradigm'. *FDG*, 2015.
- Koenitz, Hartmut 'Interactive Storytelling Paradigms and Representations: A Humanities-Based Perspective'. *Handbook of Digital Games and Entertainment Technologies*, 2016, pp. 1 – 15.
- Koenitz, Hartmut 'Beyond "Walking Simulators": Games as the Narrative Avant-Garde'. *Proceedings of the DiGRA Conference 2017*, 2017.
- Koenitz, Hartmut 'The 'Story Arc' – a Ghost of Narrative Game Design'. Melbourne: DiGRA Conference, 2017.
- Koenitz, Hartmut 'Narrative in Videogames' *In:* Lee, Newton *(eds.) Encyclopedia of Computer Graphics and Games*. London: Springer, 2018.
- Koenitz, Hartmut *et al.* 'IDN for Change: Education Approaches and Challenges in a Project Focused on Migration'. *In:* Koenitz, Hartmut *et al. (eds.)*, 2018.
- 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.
- 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.

- Kopas, Merritt 'A Synchronous Ritual', *IFDB*, 2012 [Online]. Available at: <https://ifdb.tads.org/viewgame?id=e9l7mcdj3irkf3ki> [Accessed: 20th January 2020].
- Kopas, Merritt (eds.) *Videogames For Humans.: Twine Authors In Conversation*. US: Instar Books, 2014.
- Kopas, Meritt Soft Chambers, 2015 [Online]. Available at: <http://softchambers.com/> [Accessed 8th August 2018].
- Koster, Raph et al. *AI Wish List: What Do Designers Want out of AI?* San Francisco: Game Developer's Conference, 2018.
- Kroos, Christian 'The Art in the Machine'. In: Herath, Damien *et al.*, 2016 pp. 19 – 25.
- LaMotta, V. 'Behavioural Archaeology' In: Hodder, I (eds.) *Archaeological Theory Today*. Cambridge: Polity, 2012, pp. 62 – 92.)
- Labuzke, Nicole 'Alternate Reality Gaming'. In: Ryan, Marie-Laure *et al.* (eds.), 2014, pp. 4 – 7.
- Lankoski, Petri and Bjork, Staffan 'Gameplay Design Patterns for Believable Non-Player Characters'. *Proceedings of the DiGRA 2007 Conference: Situated Play, 2007*.
- Lankoski, Petri 'Player Character Engagement in Computer Games'. *Games & Culture* 6 (4), 2011, pp. 291 – 311.
- 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].
- Laurel, Brenda *Computers as Theatre*. Boston: Addison-Wesley, 1993.
- 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.
- Lee, Tyler 'An Annotated History Of Video Game Boss Battles', *Polygon*, 2015 [Online]. Available at: <https://www.polygon.com/features/2015/9/28/9333685/annotated-history-boss-battles> [Accessed 20th July 2020].
- 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].
- Lek, Lawrence *Bonus Levels*, undated [Online]. Available at: <http://bonuslevels.net/> [Accessed: 8th August 2018].
- Lek, Lawrence 'Dalston, Mon Amour', *Bonus Levels*, 2012 [Online]. Available at: <http://www.bonuslevels.net/dalston-mon-amour.html> [Accessed: 20th July 2019].cite
- 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.
- Liboriussen, Bjarke *The Mechanics of Place: Landscape and Architecture in Virtual Worlds*. Ph.D. thesis, University of Southern Denmark, 2009.
- Liboriussen, Bjarke 'Worlds and Maps'. In: Ryan, Marie-Laure *et al.* (eds.), 2014, pp. 530 – 532.
- Lind, Stephanie 'Active Interfaces and Thematic Events in *The Legend of Zelda: Ocarina of Time*'. In: Austin, Michael (eds.) *Music Video Games: Performance, Politics and Play*. London: Bloomsbury, 2016, pp. 83 – 106.
- 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].
- Lindsey, Patrick 'The Immersion Fallacy'. *Five Out Of Ten* 8, 2014.

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.

Lopes, Ana Caterina *et al.* 'Approaches to authorship in video games: the director, the studio and the player'. *Proceedings of the International Conference on Illustration * Animation*. Portugal: CONFIA, 2018, pp. 577 – 585.

Louchart, Sandy and Aylett, Ruth 'Narrative theory and emergent interactive narrative'. *Int. J. Continuing Engineering Education and Lifelong Learning* 14 (6), 2004, pp. 506 – 519.

Love, Mark Cameron 'Not-So-Sacred Quests: Religion, Intertextuality and Ethics in Videogames'. *Religious Studies and Theology* 29 (2), 2011.

Loyall, Bryan A. *Believable Agents: Building Interactive Personalities*. [PhD Dissertation]: Carnegie Mellon University, 1997.

Lucas, Pereira Luis and Licinio, Roque 'Understanding the Videogame Medium Through Perspectives Of Participation'. *Proceedings of the 2014 DiGRA International Conference: DeFragging Games Studies*, 2014.

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.

Machidon, Octavian M. *et al.* 'Virtual humans in cultural heritage ICT: A review'. *Journal of Cultural Heritage* 33, 2018, pp. 249 – 260.

Madej, Krystina "'Traditional Narrative Structure": not traditional so why the norm?'. *Proceedings of NILE 2008*, 2008.

Madigan, James *Getting Gamers: The Psychology of Video Games and their Impact on the People Who Play Them*. Maryland: Rowman & Littlefield, 2015.

Magerko, Brian 'Interactive Drama'. In: Ryan, Marie-Laure (eds.), 2014, pp. 284 – 288.

Magic Leap, 2018 [Online]. Available at: <https://www.magicleap.com/> [Accessed 8th August 2018].

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].

Makai, Peter Kristof 'Taming the Gaming imagination: The Hidden Lexicon of Video Gaming'. In: Limpar, Ildiko (eds.) *Displacing the Anxieties of Our World: Spaces of the Imagination*. Cambridge: Cambridge Scholars, 2017, pp. 26 - 43.

Mani, Inderjeet Computational narratology, 2013 [Online]. Available at: <http://www.lhn.uni-hamburg.de/article/computational-narratology> [Accessed 18th August 2018].

Manovich, Lev, 'New Media: a User's Guide', *Manovich*, 1999 [Online]. Available at: <http://manovich.net/index.php/projects/new-media-a-user-s-guide> [Accessed: 20th October 2019].

Manovich, Lev. *The Language of New Media*. Massachusetts: The MIT Press, 2001.

Manovich, Lev, 'Database as a Genre of New Media', *AI & Society*, 2001 [Online]. Available at: http://vv.arts.ucla.edu/AI_Society/manovich.html [Accessed: 9th October, 2020].

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].

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].

- Martin, Paul 'The Pastoral and the Sublime in Elder Scrolls IV: Oblivion'. *Game Studies* (11) 3, 2011.
- Martin, Reinhold 'The Organizational Complex: Cybernetics, Space, Discourse'. *Assemblage* 37 (1), 1998, pp. 102 – 127.
- Mateas, Michael, *Expressive AI* [Paper], 2000 [Online]. Available at: <https://users.soe.ucsc.edu/~michaelm/publications/mateas-siggraph2000.pdf> [Accessed 19th June 2020].
- Mateas, Michael 'Expressive AI: A Hybrid Art And Science Practice' *Leonardo* 34 (2), 2001, pp. 147-153.
- Mateas, Michael. 'Interactive drama, art and artificial intelligence'. [PhD Thesis]. Pittsburgh: Carnegie Mellon University, 2002.
- Mateas, Michael and Stern, Andrew 'Facade: An Experiment in Building a Fully-Realized Interactive Drama'. *Game Developer's Conference*., 2003.
- Mateas, Michael 'Expressive AI: Games and Artificial Intelligence'. *Proceedings of Level Up: Digital Games Research Conference*. DGRC: Utrecht, 2003.
- May, Lawrence and McKissack, F. 'The Disciplinary Architecture of Videogame Houses'. *The Proceedings of DiGRA Australia 2020*, 2020.
- McCarthy, John 'From here to human-level AI'. *Artificial Intelligence* 171 (18), 2007, pp. 1174 – 1182.
- McCorduck, Pamela *Machines Who Think*. San Francisco: W.H. Freeman, 1979.
- McGregor, Georgia Leigh 'Situations of Play: Patterns of Spatial Use in Videogames'. *Proceedings of DiGRA 2007 Conference*, 2007, pp. 537 – 546.
- McMaster, Michael *On Formalism*, 2014 [Online]. Available at: <https://medium.com/@michaeljmcmaster/on-formalism-a1b4e95bb435> [Accessed 8th August 2018].
- 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].
- 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.
- Meredith, Ben 'Minecraft, No Man's Sky, and the Hunt for a True Archaeology Sim', *Kill Screen*, 2014 [Online]. Available at: <https://killscreen.com/previous/articles/minecraft-no-mans-sky-and-hunt-true-archaeology-sim/> [Accessed: 20th July 2019].
- Mery, David 'Hedging your bets', *EXE Magazine*, August 1999 [Online]. Available at: <https://gizmonaut.net/soapflakes/EXE-199908.html> [Accessed 20th June 2020].
- Meyrowitz, Joshua. 'Images of Media: Hidden Ferment—and Harmony—in the Field.' *Journal of Communications* 43, 1993, pp. 55–66.
- 'Microsoft Azure Computer Vision', Microsoft, 2021 [Online]. Available at: <https://azure.microsoft.com/en-gb/services/cognitive-services/computer-vision/> [Accessed: 20th January 2021].
- Might And Delight *Shelter* [PC Software] US: Might And Delight, 2013.
- Miller, Kiri 'The Accidental Carjack: Ethnography, Gameworld Tourism and Grand Theft Auto'. *Game Studies* 8(1), 2008.
- Millington, Ian and Funge, John *Artificial Intelligence for Games*. Massachusetts: Morgan Kaufman, 2009.

- Mol, Angus *et al.* *The Interactive Past: Archaeology, Heritage and Video Games*. Leiden: Sidestone Press, 2017.
- Monolith Productions *Middle Earth: Shadows of War* [PC Software]. US: Warner Bros. Interactive, 2017.
- Montfort, Nick *Twisty Little Passages: An Approach To Interactive Fiction*. Massachusetts: The MIT Press, 2005.
- Montfort, Nick 'Foreword'. In: Koenitz, Harmut *et al.* (eds.), 2015, pp. ix – xiv.
- Moralde, Oscar 'Haptic Landscapes: *Dear Esther* and Embodied Video Game Space'. *Media Fields Journal* 8 (1), 2014.
- Mori, Masahiro *et al.* 'The Uncanny Valley [From the Field]' *IEEE Robotics & Automation Magazine* 19 (2), 2012, pp. 98 – 100.
- Moss, Richard 'Build, gather, brawl, repeat: The history of real-time strategy games', *Ars Technica*, 2017 [Online]. Available at: <https://arstechnica.com/gaming/2017/09/build-gather-brawl-repeat-the-history-of-real-time-strategy-games/> [Accessed: 19th June 2020].
- Mullaney, Brett *The Greatest Art Form: Video Games and the Evolution of Artistic Expression*. CreateSpace, 2013.
- Murata, Tomoya and Shin, Jungpil 'Hand Gesture and Character Recognition Based on Kinect Sensor'. *International Journal of Distributed Sensor Networks*, 2014
- Murray, Janet *Hamlet on the Holodeck: The Future of Narrative In Cyberspace*. Boston: MIT Press, 1997,.
- Murray, Janet 'Research Into Interactive Digital Narrative: A Kaleidoscopic View'. In: Rouse, Rebecca *et al.* (eds.) London: Springer, 2018.
- Muscat, Alexander 'First-Person Walkers: Understanding the Walker Experience through Four Design Themes'. *Proceedings of the 1st International Joint Conference if DiGRA and FDG*, 2016.
- Myers, David 'Authorial intent and videogames'. In: Mitgutsch, Konstantin *et al.* (eds.) *Context Matters! Proceedings of the Vienna Games Conference 2013*. Austria: New Academic Press, 2013, pp.110 – 120.
- Navarrete-Cardero, Luis 'The Poetics of Videogames: The Logic of Sense and Meaning in Videoludic Discourse'. In: Hernandez-Santaolalla, Victor and Barrientos-Bueno, Monica (eds.) *Handbook of Research on Transmedia Storytelling, Audience Engagement and Business Strategies*. Spain: IGI Global, 2020, pp. 103 – 114.
- Neitzel, Britta *Narrativity of Computer Games*, 2014 [Online]. Available at: <http://www.lhn.uni-hamburg.de/article/narrativity-computer-games> [Accessed 8th August 2018].
- Newman, James 'The Myth of the Ergodic Videogame'. *Game Studies* 2 (1), 2002.
- Newman, James. 'In search of the videogame player'. *New Media And Society* 4 (3), 2002, pp.405-422.
- Newman, James 'Playing the system: Videogames/players/characters' *Semiotica* 173 (1), 2009, pp. 509 – 524.
- Newman, James *Videogames*. Oxon: Routledge, 2013.
- Nitsche, Michael *Video Game Spaces: Image, Play and Structure in 3D Game Worlds*. Massachusetts: The MIT Press, 2008.
- Norman, Donald *The Design Of Future Things*. New York: Basic Books, 2007.
- Novikova, Jekaterina and Watts, Leon 'A Design Model of Emotional Body Expressions in Non-humanoid Robots'. Japan: HAI, 2014.

- Novikova, Jekaterina *et al.* 'The role of emotions in inter-action selection'. *Interaction Studies* 15 (2), 2014.
- 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.
- Nox *GameMaker is an Abomination*, 2014 [Online]. Available at: http://purplepwny.com/blog/gamemaker_is_an_abomination.html [Accessed 8th August 2018].
- Nucl.ai *The Principles Of Modern Game AI*, 2015 [Online]. Available at: <https://courses.nucl.ai/> [Accessed: 8th August 2018].
- Ong, Walter J. *Orality and Literacy. The Technologizing of the Word*. London: Methuen, 1982.
- O'Reilly, David *Everything*, 2020 [Online]. Available at: <https://www.davidoreilly.com/everything> [Accessed: 20th July 2020].
- Pan, Xueni *et al.* 'Expressing Complex Mental States Through Facial Expressions'. *Proceedings of the ACII 2007*. Berlin: ACII, 2007, pp. 745 – 746.
- 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.
- Paro Robots*, 2014 [Online]. Available at: <http://www.parorobots.com/> [Accessed 18th August 2018].
- Papale, Luca 'Beyond Identification: Defining The Relationships Between Player And Avatar'. *Journal Of Games Criticism* 1(2). 2014, pp. 1-12.
- 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.
- Paul, Christiane *Digital Art*. London: Thames & Hudson, 2015.
- Paul, Christopher A. *The Toxic Meritocracy of Videogames: Why Gaming Culture is the Worst*. Minneapolis: UMP, 2018.
- 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.
- Pelzold, Charles *Code: The Hidden Language of Computer Hardware And Software*. USA: Microsoft Press, 1999.
- Penny, Simon *What Is Artful Cognition?*, 2003 [Online]. Available at: <https://pdfs.semanticscholar.org/2bc3/85604c2870c61c861966093cd4fdb615fb0.pdf> [Accessed 8th August 2018].
- Penny, Simon *Petit Mal*, 2006 [Online]. Available at: <http://simonpenny.net/works/petitmal.html> [Accessed 8th August 2018].
- Penny, Simon 'Robotics and Art, Computationalism and Embodiement'. In: Herath, Damith *et al.* *Robots And Art: Exploring An Unlikely Symbiosis*. Singapore: Springer, 2016.
- Perlin, Ken 'Can There Be A Form Between Game And Story?'. In: Wardrip-Fruin, Noah and Harrigan, Pat (eds.), 2004.
- Petrovic, Vladimir M. 'Artificial Intelligence and Virtual Worlds – Toward Human-Level AI Agents'. *IEEE Access* 6 (2018), pp. 39976 – 39988.
- 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.

- 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].
- 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].
- Pressman, Jessica 'Old Media/New Media'. *In: Ryan, Marie-Laure (eds.)*, 2014, pp. 365 – 366.
- 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.
- 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.
- 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.
- Rauschnabel, Philipp *et al.* 'An adoption framework for mobile augmented reality games: The case of Pokémon Go'. *Computers in Human Behavior* 76:1 (2017), pp. 276 – 286.
- Read, Robin and Belpaeme, Tony 'People Interpret Robotic Non-linguistic Utterances Categorically'. *International Journal of Social Robotics* 8 (1), 2016, pp. 31 – 50.
- 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].
- 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.
- Riendeau, Danielle 'A game that explores abusive relationships', *Polygon*, 2014 [Online]. Available at: <https://www.polygon.com/2014/9/12/6136433/curtain-indie-game-abuse> [Accessed: 20th July 2020].
- 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].
- 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.
- 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 .
- Relph, Edward 'The Inconspicuous Familiarity of Landscape'. *In: Champion, Erik (eds.) The Phenomenology of Real and Virtual Places*. London: Routledge, 2018.
- Roberts, David *et al.* 'Beyond Adversarial: The Case for Game AI as Storytelling'. *Proceedings of DiGRA 2009*. DiGRA, 2009.
- Rodrigues, Sergio Hortas *et al.* 'A Process Model of Empathy For Virtual Agents'. *Interacting With Computers* 27 (4), 2015, pp. 1 – 21.
- Romero, Brenda 'Train', *Brenda Romero*, 2009 [Online]. Available at: <https://brenda.games/train> [Accessed: 20th January 2021].
- 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.

- Roth, Christian and Koenitz, Hartmut 'Evaluating the User Experience of Interactive Digital Narrative'. *Proceedings of the 1st International Workshop on Multimedia Alternate Realities* (2016), pp.31 -36.
- Ruffino, Paolo 'Narratives of independent production in video game culture'. *Loading...* 7 (11), 2012, pp.106 – 121.
- Russell, Stuart and Norvig, Peter *Artificial Intelligence: A Modern Approach*. Boston: Pearson, 2009, p. 31.
- Ruttkey, Zsofia 'Constraint-Based Facial Animation'. *Constraints* 6 (1), 2001, pp.85 – 113.
- 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].
- Ryan, Marie-Laure *Possible Worlds, Artificial Intelligence and Narrative Theory*. Bloomington: U of Indiana P, 1991.
- Ryan, Marie-Laure 'Immersion vs. Interactivity: Virtual Reality and Literary Theory'. *SubStance* 28 (2) (1999), pp. 110 – 137.
- Ryan, Marie-Laure 'Beyond Myth And Metaphor* - The Case of Narrative in Digital Media'. *Game Studies* 1 (1), 2001.
- Ryan, Marie-Laure 'Interactive Narrative, Plot Types, and Interpersonal Relations'. *Proceedings of the Joint International Conference on Interactive Digital Storytelling*. Erfurt: ICIDS, 2008, pp. 6 – 13.
- Ryan, Marie-Laure 'From Playfields To Fictional Worlds: A Second Life for Ariosto'. *New Literary History* 40 (1), 2009, pp.159 – 177.
- Ryan, Marie-Laure 'Interactive Narrative, Plot Types & Interpersonal Relations'. *Intersemiose* 2 (4), 2013, pp. 26 - 37.
- Ryan, Marie-Laure 'Interactive Narrative'. In: Ryan, Marie-Laure (eds.), 2014, pp. 292 – 298.
- Ryan, Marie-Laure 'Preface'. In: Ryan, Marie-Laure *et al.* (eds.), 2014,.
- Ryan, Marie-Laure 'Spatiality Of Digital Media'. In: Ryan, Marie-Laure *et al.* (eds.), 2014, pp. 470 – 473.
- Ryan, Marie-Laure *Narrative As Virtual Reality 2: Revisiting Immersion and Interactivity in Literature and Electronic Media*. Baltimore: John Hopkins University Press, 2015.
- Ryan, Marie Laure '7 - Emotional and Strategic Conceptions of Space in Digital Narratives'. In: Koenitz, Harmut *et al.* (eds.), 2015.
- Ryerson, Liz *Indie Entitlement*, 2014 [Online]. Available at: <https://ellaguro.blogspot.com/2014/06/indie-entitlement.html> [Accessed 8th August 2018].
- Salen, Katie and Zimmerman, Eric *Rules Of Play: Game Design Fundamentals*. Massachusetts: The MIT Press, 2004.
- Samyn, Michel *Not a manifesto*, 2010 [Online]. Available at: <http://notgames.org/blog/2010/03/19/not-a-manifesto/> [Accessed 18th August 2018].
- 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].
- Sanders, April 'Parallels Between The Gaming Experience and Rosenblatt's Reader Response Theory'. PhD Thesis: University of North Text, 2013.
- Sanders, April 'Understanding the Video Game Experience through Reader Response Theory'. *READ* 2 (3), 2017, pp. 45 – 63.

- Sandry, Eleanor 'Re-evaluating the Form and Communication of Social Robots: The Benefits of Collaborating with Machinelike Robots'. *Social Robotics* 7 (1), 2015, pp. 335 – 346.
- Sandry, Eleanor 'The Potential of Otherness in Robotic Art' In: Herath, Damien *et al.* (eds.), 2016, pp. 177 – 189.
- Scenocosme, *La maison sensible*, 2015 [Online]. Available at: http://www.scenocosme.com/maison_sensible.htm [Accessed 20th March 2019].ite
- Schonbrodt, Felix and Asendorpf, Jens 'The Challenge of Constructing Psychologically Believable Agents'. *Journal of Media Psychology* 23 (2), 2011, pp. 100 – 107.
- Schneider, Edward *et al.* *Exploring the Uncanny Valley with Japanese Video Game Characters*. Proceedings of the DiGRA 2007 Conference. DiGRA, 2007.
- Schrank, Brian *Avant-Garde Videogames: Playing with Technoculture*. Massachusetts: The MIT Press, 2014.
- Schweizer, Bobby 'Moving Through Videogame Cities', *Mindscape*, 2013.
- Scott, Robin. *Skyrim Mod Categories, 2018* [Online]. Available at: <https://www.nexusmods.com/skyrim/mods/categories/> [Accessed 8th August 2018].
- Sellers, Mike *A Systemic Approach To Systemic Design*, 2015 [Online]. Available at: <https://www.youtube.com/watch?v=HR8EmTyJz9A> [Accessed 8th August 2018].
- 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].
- Shaw, Mary and Garlan, David. *Software architecture*. Englewood: Prentice Hall, 1996.
- Sherman, Rob *The Spare Set*, 2014 [Online]. Available at: <http://bonfiredog.co.uk/thespareset> [Accessed 8th August 2018].
- 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].
- Sherman, Rob *The Black Crown Project Archive*, 2018 [Online]. Available at: <https://github.com/bonfiredog/blackcrownproject> [Accessed 8th August 2018].
- Sheu, Sherri "'Bring the Lake to Your Living Room": Video Game Nature and the Meanings of Digital Ecologies'. *Environmental History* 24 (4), 2019, pp. 793 – 804.
- Shinkle, Eugenie 'Videogames and the Digital Sublime' In: Karatzogianni, Athina and Kuntsman, Adi (eds.) Germany: Springer, 2012, pp. 94 – 108.
- Short, Emily *Galatea* [PC Software], 2000, [Online]. Available at: <https://ifdb.tads.org/viewgame?id=urxrv27t7qtu52lb> [Accessed 8th August 2018].
- Short, Emily *Conversation*, undated [Online]. Available at: <https://emshort.blog/how-to-play/writing-if/my-articles/conversation/> [Accessed 8th August 2018].
- Short, Emily, 'Inform 7 For The Fiction Author', *Emily Short's Interactive Storytelling*, 2007 [Online]. Available at: <https://emshort.blog/2007/06/11/inform-7-for-the-fiction-author/> [Accessed: 20th August 2019].
- 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].

- 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=5o8QS_5oPUs [Accessed 8th August 2018].
- 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].
- SIE Japan Studio *The Last Guardian* [PS4 Software]. Japan: Sony Interactive Entertainment, 2016.
- 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.
- Simons, Jan 'Narrative, Games and Theory'. *Game Studies* 7 (1), 2007.
- Slater, Mel and Usoh, Martin 'Body Centred Interaction in Immersive Virtual Environments'. *Artificial life and virtual reality* 1 (1), 1994, pp. 125-148.
- 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].
- Smith, Ed 'Surviving Sevastopol' In: Williamson, Alan (eds.) *five out of ten: Future*. Five out of Ten, 2015, pp. 87 – 96.
- Smith Ed *Don't Hate The Game, Hate The Player*, 2017 [Online]. Available at: <https://www.youtube.com/watch?v=k7aeD1vAYCE> [Accessed 8th August].
- Smith, Harvey. *The Imago Effect: Avatar Psychology*. Game Developer's Conference, San Francisco, March 5th 2007.
- 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].
- Sobchack, Vivian 'Breadcrumbs in the Forest: Three Meditations on Being Lost in Space'. In: Sobchack, Vivian *Carnal Thoughts: Embodiment and Moving Image Culture*. Berkeley: UCP, 2004.
- 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].
- Spierling, Ulrike and Iurgel, Ido "Just Talking about Art" - Creating Virtual Storytelling Experiences in Mixed Reality'. *Proceedings of ICVS 2003*, 2003, pp. 179 – 188.
- Spierling, Ulrike 'Interaction Design Principles as Narrative Techniques for Interactive Digital Storytelling'. In: Koenitz, Hartmut *et al. (eds.)*, 2015, pp. 159 – 173.
- SpiritAI*, 2018 [Online]. Available at: <https://spiritai.com/> [Accessed 8th August 2018].
- Sterrett, Susan 'Turing's Two Tests For Intelligence*'. *Minds and Machines* 10 (4), 2000, pp. 541 – 559.
- 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].
- Stout, Jeroen *Cheongsam*, 2018 [Online]. Available at: <http://stoutgames.com/:cheongsam> [Accessed 8th August 2018].
- Suttner, Nick *Shadow of the Colossus: Boss Fight Books #10*. Los Angeles: Boss Fight Books, 2016.
- Szilas, Nicolas 'Reconsidering the Role of AI in Interactive Digital Narrative'. In: Hartmut, Koenitz *et al. (eds.)*, 2014, pp. 136 - 150.

- 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.
- Tan, Beng Kiang and Rahaman, Hafizur 'Virtual heritage: Reality and criticism'. *Proceedings of the 2009 CAAD Futures Conference*. Montreal, 2009, pp. 143 – 156.
- Tavinor, Grant *The Art Of Videogames*. London: Wiley, 2007.
- Taylor, Rex N *Virtual Fieldwork Project* [Online]. Available at: <http://visualisation.soton.ac.uk/> [Accessed 8th August 2018].
- TeeGee *Professional developer's look at GameMaker*, 2012 [Online]. Available at: <http://moacube.com/blog/professional-developers-look-at-gamemaker/> [Accessed 8th August 2018].
- Tence, Fabian et al. 'The Challenge of Believability in Video Games: Definitions, Agent's Models and Imitation Learning'. France: UEB, 2010.
- Tennent, Paul et al. 'The Challenges of Visual-Kinaesthetic Experience' *Proceedings of the 2017 Conference on Designing Interactive Systems*, 2017, pp. 1265-1276.
- Testa, Alessandro 'Religion in Videogames – Historical and Anthropological Observations'. *Heidelberg Journal for Religions on the Internet* 5 (1), 2014, pp. 249 – 278.
- The United States Naval Observatory APIs, *Naval Oceanography Portal*, 2020 [Online]. Available at: <https://www.usno.navy.mil/USNO/> [Accessed: 19th June 2020].
- Therrien, Carl, 'Interface' *In: Ryan, Marie Laure et al. (eds.)*, 2014, pp. 305 – 309.
- Thibault, Mattia *Post-digital games: The Influence of Nostalgia in Indie Games' Graphic Regimes*. *Gamevironments* 1 (4), 2016, pp. 1 – 24.
- 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].
- Thomson-Jones, Katherine *The Philosophy Of Digital Art*, 2015 [Online]. Available at: <https://plato.stanford.edu/entries/digital-art/> [Accessed: 8th August 2018].
- 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].
- Tronstad, Ragnhild 'NPC (Nonplayer Character)' *In: Ryan, Marie-Laure et al. (eds.)*, 2014, pp. 363 – 365.
- Treanor, Mike 'Investigating Procedural Expression and Interpretation in Videogames'. [PhD Thesis]. University of California Santa Cruz, 2013.
- Tremblay, Jonathan 'Improving Behaviour and Decision Making for Companions in Modern Digital Games'. *AIIDE 2013: AAAI*, 2013.
- Tronstad, Ragnhild 'Emergence'. *In: Ryan, Marie-Laure et al. (eds.)*, 2014, pp.179 – 182.
- Turing, Alan 'Computing Machinery & Intelligence'. *Mind* 49 (22), 1950, pp. 1 – 22.
- Turkle, Sherry 'Video Games and Computer Holding Power' *The New Media Reader* (2003), pp. 499 – 513.
- Turkle, Sherry *The Second Self: Computers and the Human Spirit*. Massachusetts: MIT, 2005, p. 19.
- 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].

- Turkle, Sherry *The Second Self: Computers and the Human Spirit*. Massachusetts: The MIT Press, 2005.
- Turkle, Sherry 'Artificial Intelligence At 50: From Building Intelligence to Nurturing Socialabilities'. *Proceedings of Dartmouth Artificial Intelligence Conference*, 2006.
- Unity Technologies *Unity*, 2019 [Online]. Available at: <https://unity3d.com/> [Accessed 8th August 2018].
- 'University of Missouri-Columbia. "Video games depict religion as violent, problematized, study shows"', *ScienceDaily*, 2012 [Online]. Available at: <https://www.sciencedaily.com/releases/2012/02/120227132833.htm> [Accessed: 20th January 2021].
- UCSC *Prom Week*, 2012 [Online]. Available at: <https://promweek.soe.ucsc.edu/play/> [Accessed 8th August 2018].
- Van Looy, Jan. *Understanding Computer Game Culture: The Cultural Shaping Of A New Medium*. Saarbrücken: Lambert Academic Publishing, 2010, p .117.
- VanOrd, Kevin 'The Elder Scrolls V: Skyrim', *GameSpot*, 2011 [Online]. Available at: <https://www.gamespot.com/reviews/the-elder-scrolls-v-skyrim-review/1900-6344618/> [Accessed: 18th October 2019].
- Veale, Kevin "'Interactive Cinema Is an Oxymoron, but May Not Always Be'. *Game Studies* 12 (1), 2012.
- 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.
- Vella, Daniel 'No Mastery Without Mystery: Dark Souls and the Ludic Sublime'. *Game Studies* 15 (1), 2015.
- Vlassis, Nikos *A Concise Introduction to Multiagent Systems and Distributed AI*. Paper. Informatics Institute, University of Amsterdam, 2003.
- Voorhees, Gerald 'The Character of Difference: Procedurality, Rhetoric and Roleplaying Games'. *Game Studies* 9 (2), 2009.
- Vosinakis, Spyros 'Digital Characters in Cultural Heritage Applications'. *International Journal Of Computational Methods in Heritage Science* (1), 2017.
- Wagner, Rachel 'This is Not A Game: Violent Video Games, Sacred Space, and Ritual'. *Iowa Journal of Cultural Studies* 15 (1), 2014, pp. 12 – 38.
- Wardrip-Fruin, Noah *Expressive Processing: Digital Fictions, Computer Games and Software Studies*. Massachusetts: The MIT Press, 2009.
- 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.
- Watrall, Ethan 'Digital Games as Public Archaeology', *playthepast*, 2011 [Online]. Available at: <https://www.playthepast.org/?p=938> [Accessed: 19th December 2019].
- 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].
- 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.
- 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.

- Weizenbaum, Joseph *Computer Power and Human Reason: From Judgement to Calculation*. San Francisco: W.H. Freeman, 1977.
- Welsh, Noel 'Animism: An Essential Concept in Programming', *Lambda The Ultimate*, 2002 [Online]. Available at: <http://lambda-the-ultimate.org/classic/message3659.html> [Accessed 20th October 2019]. <http://lambda-the-ultimate.org/classic/message3659.html>
- Wertheim, Margaret. *The Pearly Gates Of Cyberspace: A History of Space from Dante to the Internet*. London: W.W. Norton & Company, 2000, p. 229.
- 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.
- Williamson, Alan 'Yokosuka, 1986'. *Five Out of Ten* 3 (1), 2014.
- Williamson, Alan and Tremblay, Kaitlin *Escape to Na Pali: A Journey to the Unreal*. USA: Five out of Ten Books, 2014.
- Windfield, Alan 'Artificial Intelligence will not turn into Frankenstein's monster'. *The Observer*, 2014 [Online]. Available at: <https://www.theguardian.com/technology/2014/aug/10/artificial-intelligence-will-not-become-a-frankensteins-monster-ian-winfield> [Accessed: 20th September 2019].
- Winston, Patrick 'AI memo no. 366'. [Technical Report]. Massachusetts: MIT, 1976.
- Wiseman John *Braitenberg Vehicles: Simulator Runs*, 1998 [Online]. Available at: <http://people.cs.uchicago.edu/~wiseman/vehicles/test-run.html> [Accessed: 18th August 2018].
- Wood, Hannah 'Dynamic Syuzhets: Writing and Design Methods for Playable Stories'. *Proceedings of the International Conference on Interactive Digital Storytelling*, 2017, pp. 24 – 37.
- Wooldridge, Michael *An Introduction to MultiAgent Systems*. Chichester: Wiley, 2009.
- Wortham, Robert *et al.* 'What Does the Robot Think? Transparency as a Fundamental Design Requirement for Intelligent Systems'. *IJCAI '16*, 2016.
- Wright, Will 'Introduction' In: Freeman, David *Creating Emotion In Games*. Berkeley: New Riders, 2004.
- Wysocki, Jan 'Religion in Play: Games, Rituals, and Virtual Worlds. Review'. *HJRI* 7 (1), 2015.
- Yang, Robert and Lantz, Frank 'Gay Science', *Open Transcripts*, 2017 [Online]. Available at: <http://opentranscripts.org/transcript/gay-science/> [Accessed: 20th July 2020].
- 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.
- Yannakakis, Georgios and Togelius, Justin *Artificial Intelligence and Games*. New York: Springer, 2018.
- 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.
- YoYo Games *Gamemaker*, 2018 [Online]. Available at: <https://www.yoyogames.com/gamemaker> [Accessed 8th August, 2018].
- 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.
- Zhu, Jichen 'Dialogue Systems'. In: Ryan, Marie-Laure *et al. (eds.)*, 2014, pp. 130 – 133.

Zakowski, Samuel 'Environmental storytelling, ideologies and quantum physics: narrative space and the BioShock games'. *Proceedings of the 1st International Joint Conference of DiGRA and FDG*, 1, 2016.

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.

Zimmerman, Eric. *No Single Definition*, 2013 [Online]. Available at: <http://www.criticalpathproject.com/video/no-single-definition/> [Accessed: 18th August 2018].

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.

Zimmerman, Eric *Heller Interview*, undated [Online]. Available at: <http://www.ericzimmerman.com/texts/HellerInterview2.htm> [Accessed: 8th August 2018].

Environmental, Ecosystemic & Animal Studies

Alexander, Neil. 'On Literary Geography'. *Literary Geographies* 1 (1), 2015.

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.

Allen, Casey D. 'On Actor-Network Theory and Landscape'. *Area* 43 (3), 2011, pp. 274-280.

Anti-Weiser, Walpurga. 'Beyond hides and bones – Animals, animal representations and therianthropic figurines in palaeolithic art'. *Annalen* 120 (1), 2018, pp. 51 – 70.

Baker, J.A. *The Peregrine: The Hill Of Summer & Diaries*. London: Harper Collins, 2011.

Bennett, Jane *Vibrant Matter: A Political Ecology Of Things* North Carolina: Duke University Press, 2010.

Berenguer, Jaime 'The Effect of Empathy in Proenvironmental Attitudes and Behaviors'. *Environment and Behavior* 39 (2), 2007, pp. 269 – 283.

Bernaerts, Lars *et al.* 'The Storied Lives of Non-Human Narrators'. *Narrative* 22 (1), 2014, pp. 69 – 93.

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

Bogost, Ian *Alien Phenomenology: or, What It's Like To Be A Thing*. Minneapolis: UMP, 2012.

Bride, Brian E. 'Book Review: Compassion Fatigue in the Animal-Care Community' *Traumatology* 14 (1), 2008.

Burghardt, Gordon 'Critical Anthropomorphism, Uncritical Anthropocentrism, and Naive Nominalism'. *Comparative Cognition and Behaviour Reviews* 2 (1), 2007, pp. 136 – 138.

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.

Caracciolo, Marco 'Narrative Space and Reader's Responses To Stories'. *Style* 47 (4), 2013, pp. 425-444.

Caracciolo, Marco 'Notes for an econarratological theory of character'. *Frontiers of Narrative Studies* 4 (1), 2018, pp. 172 – 189.

Carlson, Allen 'Environmental aesthetics', *Stanford Encyclopedia of Philosophy*, 2019 [Online]. Available at: <https://plato.stanford.edu/entries/environmental-aesthetics/> [Accessed: 12th March 2020].

- Casey, Edward S. *Getting back into place. Toward a renewed understanding of the place-world*. Indianapolis: IUP, 1993.
- Cole, Michael and Engestrom, Yrjo 'A cultural-historical approach to distributed cognition'. In: Salomon, Gavriel (eds.) *Distributed Cognitions: Psychological and Educational Considerations*. Cambridge: CUP, 2001.
- Cook, Ian, and Tara Woodyer. 'Lives of things.' In: *Wiley-Blackwell Companion to Economic Geography*. Oxford: Wiley-Blackwell, 2012, pp. 226-241.
- Cressman, Darryl 'A Brief Overview of Actor-Network Theory: Punctualization, Heterogeneous Engineering and Translation'. [Research Paper]. ACT Lab/CPROST, Simon Fraser University, 2009.
- Daston, Lorraine 'Nature Became the Other: Anthropomorphism and Anthropocentrism in Early Modern Natural Philosophy'. In: Maasen S. et al. (eds.) *Biology as Society, Society as Biology: Metaphors*. Dordrecht: Springer, 1995.
- Daston, Lorraine and Mitman, Gregg. *Thinking With Animals: New Perspectives on Anthropomorphism*. Columbia: Columbia University Press, 2005.
- De Cristofaro, D and Cordle, D. 'Introduction: The Literature of the Anthropocene'. *Journal of 21st Century Writings* 6 (1), 2018, pp. 1 – 6.
- DeMello, Margo *Speaking for Animals: Animal Autobiographical Writing*. London: Routledge, 2013.
- Derrida, Jacques et al. (eds.) *The Animal That Therefore I Am*. New York: Fordham University, 2008.
- Desjarlais, Robert 'Healing Through Images: The Magical Flight and Healing Geography of Nepali Shamans'. *Ethos* 17 (3), 1989, pp. 289 – 307.
- Durrell, Lawrence *Landscape and Character*. New York: E.P. Dutton, 1971.
- 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].
- 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].
- Fludernik, Monika 'How Natural Is 'Unnatural Narratology'; or, 'What Is Unnatural About Unnatural Narratology?' *Narrative* 20 (3), 2012, pp. 357 – 370.
- 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.
- Fritz, Carole and Tosello, Gilles. 'From gestures to myth: artist's techniques on the walls of Chauvet cave'. *Paleoethnology* 7 (1), 2015, pp.208 – 314.
- Garrard, Greg *Ecocriticism*. London: Routledge, 2012.
- Gibson, William *A Reenchanted World: The Quest For A New Kinship With Nature*. New York: Henry Holt, 2009.
- Gieryn, Thomas F. *Truth-Spots: How Places Make People Believe*. Chicago: University of Chicago Press, 2018.
- Gordon, Gwendolyn J. 'Environmental Personhood' *Colum. J. Envtl. L.* 43 (1), 2018.
- Gouldner, Alvin 'The Norm of Reciprocation: A Preliminary Statement'. *American Sociological Review* 25, 1960, pp. 161-178.

- 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].
- Grusin, Richard *The Non-Human Turn*. Minneapolis: UMP, 2015.
- 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].
- Hampton, Alexander. 'Post-secular Nature and the New Nature Writing'. *Christianity and Literature* 67 (3), 2018.
- Harvey, Graham *Animism: Respecting The Living World*. Australia: Wakefield Press, 2005.
- Harvey, Graham 'Introduction'. In: Harvey, Graham (eds.) *The Handbook of Contemporary Animism*. London: Routledge, 2013, pp. 1 – 15.
- Hediger, H., Sircom, G. (trans.) *Wild Animals In Captivity*. New York: Dover, 1964.
- Herring, Peter 'The Cornish landscape' *Cornish Archaeology* 50 (1), 2011, pp. 161 – 174.
- Herman, David 'Storyworld/Unwelt: Nonhuman Experiences in Graphic Narratives'. *SubStance* 40 (1), 2011, pp. 156 – 181.
- 'Theories Of Fiction'. In: Herman, David et al. (eds.) *The Routledge Encyclopedia of Narrative Theory*. London: Routledge, 2010, pp. 163 – 167.
- Heylighen, Francis et al. (eds.) *Self-Steering and Cognition in Complex Systems: Toward a New Cybernetics*. New York: Gordon and Breach, 1990.
- 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.
- 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.
- Hones, Sheila 'Literary Geography: setting and narrative space'. *Social & Cultural Geography* 12 (7), 2011, pp.685 – 699.
- James, Erin *The Storyworld Accord: Econarratology and Postcolonial Narratives*. Nebraska: UNP, 2015.
- Jones-Fairnie, Helen 'Book Review: Compassion Fatigue in the Animal Care Community'. *Australian Veterinary Journal* 86 (5), 2008.
- Kimmerle, Heinz 'The world of spirits and the respect for nature: towards a new appreciation of animism'. *The Journal For Transdisciplinary Research in Southern Africa* 2 (2), 2006.
- Latour, Bruno 'On actor-network theory: A few clarifications'. *Soziale Welt* 47 (4), 1996, pp. 369 – 381.
- Latour, Bruno *Reassembling The Social.: An Introduction To Actor-Network Theory*. Oxford: OUP, 2005.
- 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.
- Mabey, Richard *The Cabaret Of Plants*. London: Profile, 2015.
- Macdonald, Helen, *H Is For Hawk*. London: Vintage, 2014.
- 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].
- Macfarlane, Robert *Mountains of the Mind: A History of a Fascination*. London: Granta, 2003.

- Machek, Vaclav, 'Origin Of The God Vishnu', *Archiv Orientalni* 28 (1), 1960, pp. 103 – 126.
- Marenko, Betti 'Neo-Animism and Design: A New Paradigm in Object Theory' *Design And Culture* 6 (2), 2014, pp. 219 – 242.
- Margulis, Lynn 'Symbiogenesis and Symbiogenesis'. In: Margulis, Lynn and Fester, Rene (eds.) *Symbiosis as a Source of Evolutionary Innovation: Speciation and Morphogenesis*. Massachusetts: The MIT Press, 1991, p. 1.
- McFarland, David *Animal Behaviour*. London: Longman, 1993.
- Microanimism*, 2019 [Online]. Available at: <https://www.microanimism.com/> [Accessed: 18th June 2020].
- Mingers, John 'The cognitive theories of Maturana and Varela'. *Systems Practice* 4 (1), 1991, pp. 319 – 338.
- Moran, Joe *A Cultural History of the New Nature Writing*, 2015 [Online]. Available at: <https://joemoran.net/academic-articles/a-cultural-history-of-the-new-nature-writing/> [Accessed: 20th March 2020].
- Moscardo, Gianna 'Interpretation, Culture and the Creation of Place'. *Tourism Recreation Research* 32 (3), 2007, pp. 57 – 64.
- Muller, Timo 'The Benefits of Bringing Cognitive Sciences into Ecocriticism'. *Literary Theory*, 2018 [Online]. Available at: <http://www.jltonline.de/index.php/reviews/article/view/959/2246> [Accessed: 20th March 2020].
- Nadasdy, Paul 'The gift in the animal: The ontology of hunting and human-animal sociality'. *American Ethologist* 34 (1), 2007, pp.25 – 43.
- Nayar, Pradmod, *Posthumanism*. Cambridge: Polity Press, 2014.
- Nicolson, Marjorie Hope *Mountain Gloom and Mountain Glory: The Development of the Aesthetics of the Infinite*. London: University of Washington Press, 1997.
- Ohlin, Jens David, 'Is the Concept of the Person Necessary for Human Rights?', 2005, *Cornell Law* [Online]. Available at: <https://scholarship.law.cornell.edu/facpub/434/> [Accessed: 12th July 2019].
- Payment, Simone *Greek Mythology*. New York: Rosen, 2006.
- 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.
- Poole, Steven 'Is our love of nature writing bourgeois escapism?' ,*The Guardian* , 2013 [Online]. Available at: <https://www.theguardian.com/books/2013/jul/06/nature-writing-revival> [Accessed: 20th March 2019].
- Povinelli, Elizabeth A. 'Do Rocks Listen? The Cultural Politics of Apprehending Australian Aboriginal Labor'. *American Anthropologist* 97 [3], 1995, pp. 505 – 518.
- Pryor, Francis 'Ritual Landscapes', The London Magazine*, 2015 [Online]. Available at: <https://www.thelondonmagazine.org/ritual-landscapes/> [Accessed: 20th June, 2020].
- Quirke, Stephen *The Cult of Ra: Sun-Worship In Ancient Egypt*. London: Thames & Hudson, 2001.
- Rao, Eleanora 'Mapping The Imagination: Literary Geography'. *Literary Geographies* 3 (2), 2017, pp. 115-124.
- Reinhard, Andrew 'Landscape Archaeology in *Skyrim VR*'. In: Champion, Erik M (eds.) *The Phenomenology of Real and Virtual Places*. UK: Routledge, 2018.
- Reinhard, Andrew *Archaeogaming: An Introduction to Archaeology in and of Video Games*. Germany: Berghahn Books, 2018.

- Robinson, Margaret 'Animal Personhood in Mi'kmaq Perspective'. *Societies* 4 (4), 2014, pp.672-688.
- Rose, Deborah Bird *et al.* 'Thinking Through The Environment, Unsettling The Humanities'. *Environmental Humanities* 1 (1), 2012, pp. 1 – 5.
- Ryan, Marie-Laure 'Space', *the living handbook of narratology*, 2014 [Online]. Available at: <https://www.lhn.uni-hamburg.de/node/55.html> [Accessed: 12th October 2019].
- Ryan, Marie-Laure 'Why Worlds Now?' *In*: Wolf, Mark J., 2017, pp. 3 – 13.
- Sanders, Clinton and Hirschman, Elizabeth C. 'Guest Editor's Introduction: Involvement with Animals as Consumer Experience'. *Society and Animals* 4 (2), 1996, pp. 111 – 119.
- Schneider-Mason, Matthew 'The Influence of Climate Fiction: An Empirical Survey of Readers'. *Environmental Humanities* 10 (2), 2018, pp. 473 – 500.
- Serpell, James 'Animal-assisted interventions in historical perspective'. *In*: Fine, Aubrey (eds.) *Handbook on Animal-Assisted Therapy*. London: Elsevier, 2010, pp. 17 – 32.
- Shantz, HL and Piemeisel, RL 'Fungus fairy rings in eastern Colorado and their effects on vegetation'. *Journal of Agricultural Research* 6 (5), 1917, pp. 191 – 245.
- Shepherd, Nan *The Living Mountain*. London: Canongate, 2011.
- Sherman, Robert Yoki, 2016 [Online]. Available at: <http://bonfiredog.co.uk/bonfog/2016/07/15/1739/> [Accessed 25/04/19].
- 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].
- Smith, Jos *The New Nature Writing: Rethinking The Literature Of Place*. London: Bloomsbury, 2017.
- Sober, Elliot 'Comparative Psychology Meets Evolutionary Biology'. *In*: Daston, Lorraine and Mitman, Gregg (eds.) *Thinking With Animals: New Perspectives on Anthropomorphism*. Columbia: CUP, 2006, pp. 85 – 90.
- Stark , Hannah (eds.) *Deleuze and the Non/Human*. London: Palgrave Macmillan, 2015.
- 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.
- Tam, Kim-Pong *et al.* 'Saving Mr. Nature: Anthropomorphism enhances connectedness to and protectiveness toward nature'. *Journal of Experimental Social Psychology* 49 (3), 2013, pp. 514 – 521.
- Taylor, Nicola 'Never An It': Intersubjectivity and the creation of animal personhood in animal shelters'. *Qualitative Sociology Review* 3 (1), 2007, pp. 59 – 73.
- Thomas, Charles 'Folklore from a Northern Henge Monument'. *Folklore* 64 (3), 1953, pp. 427 – 429.
- Tilley, Christopher. *A Phenomenology of Landscape: Places, Paths and Monuments*. Berg, 1994.
- Tilley, Christopher *Metaphor and Material Culture*. Blackwell: Oxford, 1999.
- Tilley, Christopher *Interpreting Landscapes*. London: Routledge, 2016.
- Tuan, Yi-Fu *Space and Place: The Perspective Of Experience*. Minnesota: University of Minnesota Press, 2001.
- Tuan, Yi-Fu 'Escapism', *Archis*, 2002 [Online]. Available at: <http://volumeproject.org/escapism/> [Accessed 3rd December 2019].

Villalobos, Alice *Quality Of Life Scale*, 2004 [Online]. Available at: http://www.aplb.org/resources/quality-of-life_scale.php [Accessed: 8th August 2018].

Von Bertalanffy, Ludwig *General System Theory: Foundations, Development, Applications*. New York: George Braziller, 1976.

Weik von Mossner, Alexa *Affective ecologies: Empathy, emotion, and environmental narrative*. Ohio: OSUP, 2017.

Westling, Louise 'Darwin in Arcadia: The Human Animal Dance from Gilgamesh to Virginia Woolf'. *Anglia* 124 (1), 2006, pp. 11 – 43.

Weston, David '7 – Nature Writing and the Environmental Imagination'. In: James, David *The Cambridge Companion to British Fiction since 1945*. Cambridge: CUP, 2015, pp. 110 – 126.

Westphal, Bertrand, Tally Jr, Robert (trans.) *Geocriticism: Real & Fictional Spaces*. New York: Palgrave Macmillan, 2007.

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.

Wolfe, Cary *What is Posthumanism?* Minneapolis: UMP, 2010.

Paratexts, Intertexts, Transmedia

Aumuller, Matthias 'Text Types', *the living handbook of narratology*, 2014 [Online]. Available at: <http://www.lhn.uni-hamburg.de/node/121.html> [Accessed: 3rd November 2020].

Beebee, Thomas O. 'Introduction: letters, genealogy, power'. In: Beebee, Thomas O. (eds.) *Epistolary Fiction in Europe, 1500 – 1850*. Cambridge: CUP, 1999, pp. 1 – 17.

Beebee, Thomas O. *Epistolary Fiction in Europe 1500 – 1850*. Cambridge: Cambridge University Press, 1999.

Birke, Dorothee and Christ, Birte 'Paratext and Digitized Narrative: Mapping the Field'. *Narrative* 21 (1), 2013, pp. 65 – 87.

Bower, Anne L. 'Dear -----: In Search of New (Old) Forms of Critical Address'. In: Gilroy, Amanda and Verhoeven, W. M., 2000.

Branwyn, Gareth 'Touch Me Not, a surreal 18th century manual on how to raise the Devil, and then send him treasure hunting', *Boing Boing*, 2018 [Online]. Available at: <https://boingboing.net/2018/05/14/touch-me-not-a-surreal-18th-c.html> [Accessed: 10th January 2021].

Breen, Benjamin 'This Misterie of Fucking': A Sex Manual From 1680', *Jezebel*, 2013 [Online]. Available at: <https://jezebel.com/this-misterie-of-fucking-a-sex-manual-from-1680-575810241> [Accessed: 20th June 2020].

Carroll, Nilson Thomas 'The Lost Art of the Video Game Instruction Manual'. *The Artifice*, 2014 [Online]. Available at: <https://the-artifice.com/lost-art-of-video-game-instruction-manual/> [Accessed: 20th June 2020].

Cernau, Teodora 'Who's Afraid of Kafka's Soup?' *The Scientific Journal of Humanistic Studies* 8 (15), 41 – 46, 2014.

Clore, Dan 'The Lurker on Threshold of Interpretation: Hoax Necronomicons and Paratextual Noise', 2006 [Online]. Available at: <http://www.geocities.ws/clorebeast/lurker.htm> [Accessed 20th October 2019].

Cockburn, J.S. 'Early-modern assize records as historical evidence'. *Journal of the Society of Archivists* 5 (4), 1975, pp. 215 – 231.

Consalvo, Mia 'When paratexts become texts: de-centering the game-as-text'. *Critical Studies in Media Communication* 34 (1), 2017, pp. 177 – 183.

- Crowley, Aleister, *The Book Of The Law*. London: Red Wheel, 1977.
- Davis, Ashley 'The seven best videogame manuals of all time', *Destructoid*, 2009 [Online]. Available at: <https://www.destructoid.com/stories/the-seven-best-videogame-manuals-of-all-time-158352.phtml> [Accessed: 20th January 2021].
- Dena, Christy *Transmedia Practice: Theorising the Practice of Expressing a Fictional World across Distinct Media and Environment*. [PhD dissertation], University of Sydney, 2009.
- Dena, Christy 'Transmedial Fiction'. In: Ryan, Marie-Laure et al. (eds.), 2014, pp. 486 – 489.
- Ezell, MJ "'Invisible Books'". In: Rogers, Pat and Runge, Laura (eds.) *Producing the Eighteenth-Century Book: Writers and Publishers in England 1650 – 1800*. Delaware: UDP, 2009, pp. 53 – 69.
- Fairclough, Norman *Discourse and Social Change*. Cambridge: Polity Press, 1992.
- Field, Catherine. "Many hands hands": Writing the Self in Early Modern Women's Recipe Books.' In: *Genre and Women's Life Writing in Early Modern England*. London, Routledge, 2016, pp. 49-63.
- Fleming, Laura 'Expanding Learning Opportunies with Transmedia Practices: *Inanimate Alice* as an Exemplar'. *JMLE* 5 (2), 2013, pp. 370 – 378.
- Forbes, Paula 'Linton Hopkins on How to Read Cookbooks, Literary Criticism, and Mayonnaise', *Eater*, 2012 [Online]. Available at: <https://www.eater.com/2012/9/10/6547753/linton-hopkins-on-how-to-read-cookbooks-literary-criticism-and> [Accessed: 12th June 2020].
- Freeman, Matthew and Rempazzi Gambarato, Renira (eds.) *The Routledge Companion to Transmedia Studies*. London: Routledge, 2018.
- Genette, Gérard 'Discours du récit'. In: *Figures III*. Paris: Seuil, 1972.
- Genette, Gerard *Paratexts: Thresholds of Interpretation*. Cambridge: CUP, 1997.
- Gilroy, Amanda and Verhoeven, W.M., 'Introduction'. In: Gilroy, Amanda and Verhoeven, W.M. (eds.) *Epistolary Histories: Letters, Fiction, Culture*. London: University Press of Virginia, 2000.
- Goddard, Michael. 'Media Ecology' In: Ryan, Marie-Laure et al. *The John Hopkins Guide To Digital Media*. Baltimore: John Hopkins University Press, 2014.
- Gray, Jonathan *Show Sold Separately: Promos, Spoilers and Other Media Paratexts*. London: New York University Press, 2010.
- Haberer, Adolphe 'Intertextuality in Theory and Practice'. *Literatura* 49 (5), 2007, pp. 54 – 67.
- Harde, Roxanne and Wesselius, Janet (eds.) *Consumption and the Literary Cookbook*. London: Routledge, 2021.
- Igra, Alma 'Leftovers: Cooking, Blogging, and Studying History from Old Recipes', *The Recipes Project*, 2015 [Online]. Available at: <https://recipes.hypotheses.org/6946> [Accessed: 20th June 2020].
- Jaffe, Catherine '18th Century Spanish Conduct Literature for Women'. [Research Report], *Texas State University*, 2006 [Online]. Available at: <https://digital.library.txstate.edu/handle/10877/2830> [Accessed: 20th June 2020].
- Jenkins, Henry Yes, Transmedia HAS a History! An Inrview 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].
- 'John Harries' Book of Incantations', *The National Library of Wales*, 2020 [Online]. Available at: <https://www.library.wales/discover/digital-gallery/manuscripts/modern-period/john->

harries-book-of-incantations/#?c=&m=&s=&cv=&xywh=-2344%2C0%2C5355%2C3615
[Accessed: 20th June 2020].

Khaw, Cassandra, 'What Are The Best Game Manuals?', *Roch Paper Shotgun*, 2015 [Online]. Available at: <https://www.rockpapershotgun.com/2015/09/11/what-are-the-best-game-manuals/> [Accessed: 20th June 2020].

Knuuttila, Maarit 'Narrating Cuisines – food stories and paratexts in regional cookbooks'. [Paper], [Online]. Available at: https://www.academia.edu/8774814/Narrating_cuisines_food_stories_and_paratexts_in_regional_cookbooks [Accessed 9th June, 2018].

Konzack, Lars 'The subcreation of J.R.R. Tolkien's Middle-earth and How It Became Transmedial Culture'. In: Wolf, Mark J. (eds.), 2017, pp. 69 – 82.

Kristeva, Julia *Desire in language: A semiotic approach to literature and art*. New York: Columbia University Press, 1980.

Leong, Elaine and Pennell, Sara 'Recipe Collections and the Currency of Medical Knowledge in the Early Modern "Medical Marketplace"'. In: Jenner, Mark S. R. and Wallis, Patrick (eds.) *Medicine and the Market in England and its Colonies c. 1450 – c. 1850*. London: Palgrave Macmillan, 2007, pp. 133 – 152.

Mansfield, Deb 'The Armchair Traveller: Littoral Zones and the Domestic Environment'. [Masters Thesis]. UNSW, March 2013.

Marvin, Carolyn *When Old Technologies Were New: The Emergence of Modern Communications in the Late Nineteenth-Century*. New York: Oxford University Press, 1988.

Matthews, Harry and Brotchie, Alastair *Oulipo Compendium*. London: Atlas Press, 2010.

McCain, Katherine Elizabeth 'Canon vs. "Fanon": Genre Devices in Contemporary Fanfiction'. [Masters Thesis]. Georgetown University, 2015.

McDowell, Paula "'The Manufacture and Lingua-facture of Ballad-Making": Broadside Ballads in Long Eighteenth-Century Ballad Discourse'. *The Eighteenth Century* 47 (2), 2006, pp. 151 – 178.

McLuhan, Marshall *Understanding Media: The Extensions Of Man*. Massachusetts: The MIT Press, 1994.

Mirenayat, Ali and Soofastaei, Elaleh 'Gerard Genette and the Categorization of Textual Transcendence'. *Mediterranean Journal of Social Sciences* 6 (5), 2015.

Notaker, Henry *A History of Cookbooks: From Kitchen to Page over Seven Centuries*. Berkeley: UCP, 2017.

Otto, Bernd-Christian [Personal Correspondence], 2016.

Passalacqua, Franco and Pianzola, Federico 'Defining transmedia narrative: problems and questions. Dialogue with Mary-Laure Ryan'. *Enthymema* 4 (1), 2011, p.p. 65 – 72.
Peterson, Joseph (eds.) *Arbatel: Concerning the Magic of the Ancients*. London: Ibis Press, 2009.

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.

Rankine, David and Barron, Paul Harry (eds.) *The Complete Grimoire of Pope Honorius*. London: Avalonia, 2013.

Richardson, Ingrid and Keogh, Brendan 'Mobile Media Matters: The Ethnography and Phenomenology of Itinerant Interfaces'. In: Hjorth, Larissa et al. (eds.) *The Routledge Companion To Digital Ethnography*. London: Routledge, 2017, pp. 211 – 220.

Rodriguez-Ferrandiz, Raul 'Paratextual Activity: Updating the Genettian approach within the transmedia turn'. *Communication and Society* 30 (1), 2017, pp. 165-182.

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].

Ryan, Marie-Laure 'Transmedia Narratology and Transmedia Storytelling' *Artnodes* 18, 2016 [Online]. Available at: <https://artnodes.uoc.edu/articles/abstract/10.7238/a.voi18.3049/> [Accessed 8th August 2018].

Scheffel, Michael 'Narrative Constitution', *the living handbook of narratology*, 2013 [Online]. Available at: <https://www.lhn.uni-hamburg.de/node/57.html> [Accessed: 3rd June 2020].

Steel Crate Games, *Keep Talking And Nobody Explodes*, 2018 [Online]. Available at: <https://keeptalkinggame.com/> [Accessed: 20th November 2020].

Steinby, Liisa 'Concepts of Novelistic Polyphony: Person-related and Compositional-Thematic'. In: Steinby, Liisa and Klapuri, Tintti (eds.) *Bakhtin and His Others: (Inter)subjectivity, Chronotope, Dialogism*. London: Anthem, 2013.

Smyth, Adam 'Almanacs, Annotators and Life-Writing in Early Modern England'. *English Literary Renaissance* 38 (2), 2008, pp. 200 – 244.

Suleman, Muhammad Babar 'Like life itself: blurring the distinction between fiction and reality in the *Four Broken Hearts* transmedia storyworld'. *Journal of Media Practice* 15 (3), 2014, pp. 228 – 241.

Theophano, Janet 'Eat My Words: Reading Women's Lives Through the Cookbooks They Wrote'. London: Palgrave Macmillan, 2003.

Thon, Jan-Noel 'Mediality'. In: Ryan, Marie-Laure et al. *The John Hopkins Guide To Digital Media*. Baltimore: The John Hopkins University Press, 2014.

Thon, Jan-Noel 'Narrativity'. In: Ryan, Marie-Laure et al. (eds.), 2014, pp. 351 – 355.

Tilton, Hereward 'A Most Rare Compendium: An 18th-Century Guide to Magical Treasure Hunting?' *Literary Hub*, 2019 [Online]. Available at: <https://lithub.com/a-most-rare-compendium-an-18th-century-guide-to-magical-treasure-hunting/> [Accessed: 10th Jan 2021].

Walker, Jill 'Distributed Narrative: Telling Stories across Networks'. In: Consalvo, Mia et al. *Internet Research Annual 2004*. Brighton: Peter Lang, 2004.

Ware, Daniel J. 'The Slow and Silent Death of the Video Game Manual', *Medium*, 2018 [Online]. Available at: <https://medium.com/super-jump/the-slow-and-silent-death-of-the-video-game-manual-cb22eb3167bf> [Accessed: 20th January 2021].

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.

Wonderbook™: *Book of Spells, Playstation*, 2020 [Online]. Available at: <https://www.playstation.com/en-gb/games/wonderbook-book-of-spells-ps3/> [Accessed: 20th November 2020].

Miscellaneous

Arts and Humanities Research Council *AHRC*, 2018. [Online]. Available at: <http://ahrc.ac.uk> [Accessed 25th August 2018].

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].

Burgess, Robert *In The Field: An Introduction To Field Research*. Hemel Hempstead: George Allen and Unwin, 1984.

Chesko *Frostfall – Hypothermia Camping Survival*, 2016 [Online]. Available at: <https://www.nexusmods.com/skyrim/mods/11163> [Accessed 8th August 2018].

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

Isoku *Shooting Stars*, 2013 [Online]. Available at: <https://www.nexusmods.com/skyrim/mods/25022> [Accessed 8th August 2018].

Jameson, Fredric *Postmodernism, or the Cultural Logic of Late Capitalism*. USA: Duke University Press, 1991.

Laast *Pure Waters*, 2014 [Online]. Available at: <https://www.nexusmods.com/skyrim/mods/1111> [Accessed 8th August 2018].

LordConti2 *Take Notes – Journal of the Dragonborn*, 2014 [Online]. Available at: <https://www.nexusmods.com/skyrim/mods/48375> [Accessed 8th August 2018].

Murakami, Haruki *Kafka on the Shore*. London: Vintage, 2005.

Museum of Witchcraft and Magic *Visit*, 2017 [Online]. Available at: <https://museumofwitchcraftandmagic.co.uk/visit/> [Accessed: 8th August 2018].

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].

Research Fish Limited *researchfish(tm)*, 2018. [Online]. Available at: <https://www.researchfish.net/> [Accessed 25th August 2018].

Roy Rosenzweig Center of History and New Media *Zotero*, 2018. [Online] Available at: <http://zotero.org> [Accessed 25th August 2018].

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].

Sherman, Rob *Rob Sherman*, 2020 [Online]. Available at: <http://robsherman.co.uk> [Accessed: 20th June 2020].

Sherman, Rob *Rob Sherman*, 2020 [Online]. Available at: <http://robsherman.co.uk> [Accessed: 20th June 2020].

Torrise, Vanna Savina and Hall, Ashley 'Missing miscommunications in interdisciplinary design practice'. *Proceedings of E & PDE 2013*. Dublin, 2013, pp. 581 – 586.