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Playing with taskscapes

Representing medieval life through video games technologies

Juan Hiriart

Introduction

The understanding of the world around us, along with the comprehension of our position within it, has always been a key cultural concern manifested in a myriad of representational forms that focus on the landscape as their main subject. The 'landscape idea', as Cosgrove calls it, conforms 'a characteristically modern way of encountering and representing the external world: in its pictorial and graphic qualities, in its spatiality and ways of connecting the individual to the community'.¹ Within this wide spectrum of representational forms, video games are undoubtedly a newcomer. Even though they inherit and follow the conventions and representational traditions of previous media forms, video games also come with new and distinct ways to encode and communicate the meanings of landscapes.

In contrast to previous forms of representation, which can only offer the illusion of entering alternate reality spaces without providing the means to walk through and interact with them, video games for the first time give visitors the power not just to navigate game worlds but also to become a participatory agency in their procedural structuring, which is manifested through the social and cultural processes involved in their production. As Longan argues, '[b]ecause they are interactive, video games have the potential to directly involve players in the production of virtual landscapes and therefore [. . .] to imagine and recognise the labor required to produce the concrete landscapes they see when they go outside'.² In other words, whereas our relationship with the landscape in previous non-interactive media was restricted to that of an external observer, in video games it can potentially be extended to that of an *inhabitant* – a form of engagement that opens the door to understanding historical processes in ways that were not possible before.

In this chapter, my purpose is to explore the new affordances of video games as mediations of historical landscapes; therefore, I will base the discussion on the analysis of Timothy Ingold's ideas on inhabitation as presented in his influential paper 'The

Temporality of the Landscape'.³ To steer the analysis towards the context of video games, I will discuss the ways in which Ingold's arguments, explained through his analysis of Bruegel the Elder's painting *The Harvesters*,⁴ were translated into an experimental historical game based on the Anglo-Saxon period of British history. In the discussion that follows, I will describe the multiple systems implemented in the game prototype, focusing on the design solutions devised to embed social and cultural meanings into the game's objects and environment.

Taskscapes

In 'The Temporality of the Landscape', Ingold proposed a new conceptual framework to study inhabited environments by analysing them in terms of the processes and changes occurring from human intervention. More than anything, with this framework Ingold made an attempt to bring together two aspects traditionally understood as separate: 'the naturalistic view of the landscape as a neutral, external backdrop to human activities, and the culturalistic view that every landscape is a particular cognitive or symbolic ordering of space'.⁵ For Ingold, both dimensions need to be integrated, and should not be seen in isolation from each other. As an entity in constant change, the landscape predisposes and affects the lives of people living within its boundaries and, in turn, it is affected by them as they go along with their 'business of life'. Citing Heidegger, Ingold defines this view as the 'dwelling perspective' – an approach where the actions and tasks carried out by inhabitants, whether performed in the imagination or in the physical substrate of their world, become intertwined with 'the specific relational contexts of their practical engagement with their environment'.⁶

In an attempt to make this complex web of human interventions visible, Ingold proposed to map them in a new conceptual layer – the taskscape – to be laid out over the physical surface of the landscape. This new layer constitutes of a way to make visible 'the practices of work in their concrete particulars',⁷ bringing to the fore the relationships and interdependencies between inhabitants and the environment. In the same way that the landscape can be described as an array of related features, by analogy, the taskscape can be seen as an array of related activities or tasks ('the constitutive acts of dwelling'⁸) that allow us to decipher the processes of human inhabitation.

Seen as a form of representation, the idea of the taskscape has a profound impact on the ways we have traditionally communicated the meanings of landscapes. For centuries, our understanding of the places where we live has been mediated by different forms of representation, which have determined the way we think about our surroundings. Far from remaining static, the landscape as a term, idea or 'way of seeing' the external world has evolved to reflect the dominant ideologies of their historical period. However, as Cosgrove indicates, throughout all these changes the idea of the landscape has remained a visual term, one that arose initially during the renaissance and redefined the way we represent concepts of space. So, how the ideas contained in the taskscape fit into this history of landscape representation? How can they be meaningfully expressed using contemporary means of representation?

Ingold explicitly states that only by 'recognising the fundamental temporality of the landscape itself',⁹ we are able to access the meanings of taskscapes. Arguably, for this to happen, we need a medium capable of dealing with the dimension of time. This requisite can be observed in Ingold's efforts to explain his ideas about the landscape as an entity in constant change. As he writes:

Imagine a film of the landscape, shot over years, centuries, even millennia. Slightly speeded up, plants appear to engage in very animal-like movements, trees flex their limbs without any prompting from the winds. Speeded up rather more, glaciers flow like rivers and even the earth begins to move. At yet greater speeds solid rock bends, buckles and flows like molten metal. The world itself begins to breathe.¹⁰

In this exercise of imagination, the medium that Ingold first identifies as a film becomes an interactive simulation, where the observer can effectively 'play' with the scales and cycles that determine the passing of time.

Continuing with his exposition, Ingold later references the painting *The Harvesters*. Originally part of a series of six pieces representing different times of the year and from which only five survived to present day, the painting represents the agricultural life of a rural community from the Netherlands during the month of August. Using this painting pedagogically as an entry point to understand landscapes, Ingold invites the reader not to look at the picture as an external reality hanging on the wall, but to become immersed in the representation. In his words, he asks the reader 'to regard this painting by Bruegel as though it were its own world, into which you have been magically transported. Imagine yourself, then, set down in the very landscape depicted, on a sultry August day in 1565.'¹¹ Although this exercise can only be achieved through the use of imagination, it illustrates an important point: the understanding of the landscape from a 'dwelling perspective' requires us to become, at least in imagination, dwellers ourselves, in order to establish a connection with a world that can only be gained by being part of it. This connection cannot be made from an external point of view and certainly cannot be established in only one direction. As Ingold explains:

Whereas both the landscape and the taskscape presuppose the presence of an agent who watches and listens, the taskscape must be populated with beings who are themselves agents, and who reciprocally 'act back' in the process of their own dwelling. In other words, the taskscape exists not just as activity but as interactivity.¹²

In spite of the mastery of their author, traditional non-interactive means of representation (e.g. books) appear limited to achieve this, but interactive technologies, computer games in particular, are uniquely equipped to fulfil the requirements of immersion, participation and interactivity within representations. In what follows, my goal is to explore this argument by contextualizing Ingold's ideas in the concrete example of a historical video game.

Bringing taskscapes to life

The Anglo-Saxon game

With the aim of investigating video games as representations of historical landscapes, I set myself the project of designing and producing an educational game prototype situated in the early Anglo-Saxon period of England, around the fifth century. As it is possible to discern from historical and archaeological sources, this was a time of great change in Britain as the physical characteristics of the people, language, social and cultural institutions were radically transformed by the mass migration of Germanic tribes who arrived and settled in this land after the departure of the Romans, around AD 410. Due to the lack of primary historical sources documenting this period, it is still unclear how this process, in which a significant part of the Celtic British population was replaced by Germanic incomers, took place. In line with the accounts from the venerable Bede,¹³ it was assumed for the most part of the twentieth century that this was a violent process during which great hordes of Germanic invaders arrived and pushed the native population out of their lands, but this account has been called into question in light of more recent historical and archaeological interpretations. In particular, Härke¹⁴ challenges the ‘maximalist’ narrative of a mass migration, conceiving it as a process rather than an event, where geographically diverse groups with differing origins, composition and sizes arrived at different times to British shores. According to this author, these different migration patterns can be broadly grouped into two phases: a first ‘conquest’ period during the fifth and sixth centuries where immigrants and their descendants practiced a form of apartheid with the native population in order to establish and preserve their dominance, followed by a phase on the seventh and eighth centuries with an increasing acculturation and assimilation between both groups.

In line with these interpretations, an important goal of the game was to represent the drastic social and cultural changes of the time and communicate the different patterns of integration and culturally distinct ‘ways of life’ of Roman-British and Anglo-Saxons. To emphasize these processes, I decided to centre the game on the representation of everyday life during this time of drastic change and to avoid the excessive focus on the representation of violent conflict. In this sense, the game prototype is in contrast to most historical games based around this period, in which combat mechanics are designed to be the most important form of interaction. The reasons for this are not difficult to comprehend; Salen and Zimmerman¹⁵ and Crawford¹⁶ stated that games are primarily systems of conflict, naturally inclined to represent any determined situation as a clash between opposing forces. In this respect, Stuart warns that ‘in games, violence is often the core feedback loop, the defining mechanism. Everything gets swallowed up into this dysfunctional vortex.’¹⁷ To avoid this, the game prototype purposely avoided the implementation of combat mechanics, focusing instead on translating everyday tasks and environmental dynamics to gameplay form. As such, the prototype’s leading design concept was to implement a ‘playable taskscape’, a form of gameplay where the player, embodying the identity of an Anglo-Saxon free peasant, has to find the means to settle in the new land. For this, the player has to spend much of his or her time performing the everyday tasks and routines representative of this period. In-game tasks, thus, were

conceptualized as multi-layered clusters of meaning, which had to be enacted to be fully understood by the player. At its most basic, these tasks could be interpreted as the means to survive in a challenging environment, but in a more in-depth reading, they could be seen as carriers of cultural meanings, driving players to 'inhabit' the identity of a historical agent to interact with a rich and complex historical environment.

Inhabiting game worlds

Ingold begins his analysis of *The Harvesters* painting by examining the spatial composition, structured by a juxtaposition of perspectival planes describing representative activities from agricultural life. A clear visual path is connecting all these planes, established by the many tracks carved by the movements of the community over the years, providing evidence of the continuity of their productive work. For Ingold, these tracks are 'the taskscape made visible'¹⁸ – a representation that not only describes the movements of the people but it does so by inviting the observer to be part of it. As a master in the art of landscape representation, Bruegel created the illusion of a world not just to be 'seen' but to be 'felt', compelling the viewer to follow in their imagination the paths and tracks throughout the undulations of the landscape. The painting is constructed to be 'directly incorporated into our bodily experience'.¹⁹

Even though Bruegel's artistic skill makes the best of the medium to create the illusion of 'being there', this representational goal remains as 'an aesthetic entrance, not an active engagement with nature or space that has its own life'.²⁰ In contrast, video games are the first medium to allow observers to navigate the represented world by changing their point of view and spatial relation with the objects of the landscape, while becoming also a participatory agency in the procedural structuring of the world. This ability is augmented by the technological prowess of the medium, which is now capable of rendering in real-time highly detailed worlds, almost indistinguishable from their real referents. With these new affordances, we could be tempted to think that the illusion is complete as the observer can now be magically transferred inside the representation, as Ingold asked readers to do at the beginning of his paper. I would argue, however, that this is not the case. Even with the added power of navigating the scene through the virtual embodiment of an avatar, a critical distance between the player and the virtual world persists, preventing them to gain a meaningful connection with the landscape. To close this gap, it is necessary to convert players from external navigating observers to inhabitants of the game world.

Nevertheless, can game worlds be inhabited? To answer this question, I would like to invite the reader to first consider the observation that Ingold makes about the tree – a prominent detail in *The Harvesters* painting:

In its present form, the tree embodies the entire history of its development from the moment it first took root. And that history consists in the unfolding of its relations with manifold components of its environment, including the people who have nurtured it, tilled the soil around it, pruned its branches, picked its fruit, and – as at present – use it as something to lean against. The people, in other

words, are as much bound up in the life of the tree as is the tree in the lives of the people.²¹

In other words, the space where the tree stands has become a *place*, clearly distinguishable from the space and other objects around, imprinted in the personal and collective memories of the people that have decided to rest under its shadow. This distinction is important; Kalay and Marx asserted that '[p]eople inhabit places, not spaces'.²² Arguably, a game world devoid of meaningful places will remain at an abstract level, detached from the player and failing to bring the subtle layers of meaning of historical worlds.

According to Tuan, a place has history and meaning, and incarnates the experiences and aspirations of its inhabitants. Virtual places, therefore, cannot be produced within game worlds by merely reconstructing historical landscapes through high-resolution geometry and beautifully crafted textures, no matter how realistic they look when put together in the virtual world. Rather, virtual places need to somehow incorporate the historical and relational meanings that we find in real places, which are composed of memories and feelings as much as rational thoughts. Tuan stated:

[t]o know a place fully means both to understand it in an abstract way and to know it as one person knows another. At a high theoretical level, places are points in a spatial system. At the opposite extreme, they are strong visceral feelings.²³

To create a sense of inhabitation in historical game worlds, a connection needs to be established between the player in the form of knowledge that is both personal and social, and manifests itself in a juxtaposition of narratives created from lived experiences. Game worlds devoid of these narratives are condemned to feel empty and soulless²⁴ – spaces that cannot be defined as relational, historical or concerned with identity (what Auge describes as 'non-places'²⁵). Any mediation – through video games, films or any other media – with the aspiration of conveying a sense of place needs to create this primary feeling of inhabitation that rises from the reading and writing of the continuous flow of experiences that bring meaning to a place.

In this Anglo-Saxon game prototype, the important design decision to bring an otherwise inert world into life was accomplished by making every object of the world something to be 'learned' from. The guiding principle behind this was to construct a responsive, meaning-rich world, in which every object could be appreciated as something more than just visual graphics and collision geometry. By directing the player's attention to the surrounding objects (i.e., by highlighting them upon their proximity), as well as simulating real-world interactions through computer metaphors such as 'rolling-over' and 'clicking', the medium became tuned to a way of accessing the meanings of the environment that Ingold, citing Gibson, identifies as an 'education of attention'.²⁶ Described as a way of knowing and guided discovery, this process operates by directing the attention of the novice to salient features of the environment, letting them construct their knowledge without mediation, through a fine-tuning of their perceptual skills. Following this idea, a combination of diegetic and non-diegetic systems were implemented in the game prototype to make every object accessible,

guiding the player to perceive the world, not only as the manifestation of a quantitative rule-based model but also as a collection of narratives and situated understandings connecting the people and the place.

Representing everyday tasks

Continuing with his analysis of Bruegel's painting, Ingold's attention turns to the agricultural tasks that form the central motif of the representation. Ingold describes how the painter, instead of registering the scene as a cameraman would do by taking a snapshot of what is happening at a particular moment in time, he offers a series of passages, which, although presented synchronically in the static pictorial space, are meant to represent the entire process of agricultural production. Accordingly, narrative appreciation of the painting by looking at the different characters busily working on different tasks yields a general reading where the 'cycle of production and consumption ends where it began, with the producers.'²⁷ In essence, Bruegel's painting appears as an early attempt to generate a procedural representation of reality: a snapshot of what could have been an agent-based simulation if that technology was available in the sixteenth century. If Ingold was to push his initial invitation even further, he would encourage the reader not only to immerse themselves into Bruegel's world but to become one of the harvesters and access the meanings of medieval rural life by taking an active part in the cycle of production and consumption.

This form of engagement, even though impossible to be implemented in non-interactive forms of representation, is precisely what defines the medium of video games. As Aarseth argued, video games are not objects but processes, which do not materialize without the active involvement of players playing them.²⁸ How can taskscapes be translated into video game form? Given the ability of modern game technology to produce hyper-realistic worlds, it would be tempting to aim for the maximum level of realism that the medium is able to achieve and produce a direct depiction of the real world into the video game. This aim seems to have been achieved by the second wave of VR technology, with a proliferation of heritage and archaeological projects attempting to create a complete sense of immersion. However, this achievement in development can be misleading. We should not miss the point that video games, despite their level of realism, are always simulations of reality and to this extent the translation of any real-world semantics always implies a degree of simplification.²⁹ Hence, a key part of this translation depends on determining what aspects will be included in the simulation, and what level of fidelity will be incorporated in their representation.

In the context of the Anglo-Saxon prototype game, its emphasis on everyday life is expressed primarily by actions linked to the exploration of the affordances provided by the objects available in the environment. This process is implemented in four stages. In the first stage (object selection), the player selects a specific object from the space near their avatar. This selection, made simply by mouse-clicking on the object, exposes a list with the object's affordances (an enumeration of what the player can do with or through the selected object). Once one of the available affordances is selected the game opens the interface of a new task, where the player is asked to decide its allocation, defining who (player or family member) will perform the task. While deciding the task

allocation, the interface displays the duration of the task as one of the most important factors to consider. In fact, if the task is allocated to a family member the player is free to move and occupy themselves with another activity but, if the task is assigned to the player its execution demands the player to wait until the task is finished. With this mechanic, the design of the game recognizes the duration of the task as its 'cost' or what Ingold defines as 'the currency of labour'.³⁰

Simulating people

In the final part of his article, Ingold focuses on the social dynamics of the taskscape, which in the painting are suggested by multiple characters busily working on different tasks. He argues that the taskscape's very existence depends on the presence of these working agents:

Far off in the distance, wafted on the light wind, can be heard the sounds of people conversing and playing on a green, behind which, on the other side of the stream, lies a cluster of cottages. What you hear is a taskscape.³¹

In other words, the taskscape is essentially a social reality. Although single individuals can carry on with their tasks in relative isolation from each other, it is in the intricate web of relations and interdependencies between them that the taskscape becomes alive.

Even though the representation of social environments has been the focus of many game titles it is also true that, in most of them, non-player characters (NPCs) exist only as support of gameplay or as mere decorations put together to create the illusion of an inhabited reality. In virtual heritage projects, virtual characters are primarily used as guides programmed with limited conversational capabilities.³² Both in games and virtual heritage environments, sooner rather than later it becomes apparent to users that the simulation of social life is reduced to theatrical props barely holding the illusion of a more meaningful social and cultural interactions. Some titles, however, have implemented more complex social behaviours, by including NPCs with their own individual routines and goals, carrying on with their lives even when they are not in the player's field of view.³³ Games of this type bring gaming worlds close to Agent Based Modelling (ABM) simulations, used in social and natural sciences research. In these scientific applications, complex phenomena can be explored by adjusting sets of variables to control micro-behaviours of individual agents, which in turn affect the macro-behavioural patterns of the system as a whole. As Graham³⁴ asserts, an ABM simulation 'can be thought of as a game that plays itself'. Indeed, by allowing researchers to tinker with the data and the procedures embedded in the simulation, many of these systems look and feel like a game and it is not uncommon to find efforts made by researchers to 'gamify' ABM models with the goal of converting them into full playable games.³⁵ In my view, however, these initiatives find themselves missing a crucial point: video game mechanics and aesthetics can and should do more than just simulate social environments, no matter how realistic and historically accurate their implementation may be.

The main potential of games does not reside on their capacity to accurately simulate past realities in the intricate detail of 'how things worked' but to engage players in

a dramatic experience that drives them to 'care' about the way things worked in the past. As Heidegger famously argued, the attitude of care or concern (*Sorge*) lies at the very basis of our existential relationship with the world. There is no such thing as a human being completely indifferent of the happenings in their surroundings and the consequences of their decisions. This primordial attitude of care, however, is distorted in worlds devoid of any 'moral physics'.³⁶ Although this makes digital games and simulations ideal platforms for testing hypotheses that would be unthinkable to perform in the real-world, by the same token it converts them into environments where anything can be done and nothing really matters. Any game that aspires to foster a meaningful understanding of the past requires altering this practice in order to urge players to reflect on the effect of their decisions with an elevated sense of choice and responsibility.³⁷

Fortunately, there are gaming instances that can be used as referents to build this type of worlds. The intriguing gadgets known as *Tamagotchis* certainly are noteworthy; invented by Akihito Yokoi (Wiz Co. Ltda.) and Aki Maita (Bandai Co. Ltda.), they were first sold in Japan in 1996 and consisted of virtual pets designed to replicate the bond that real-world owners have with their real-world pets. In these minimalistic simulations, the representation of a pet was reduced to a few pixels on the screen and the way to interact with it depended almost entirely on the fulfilment of the incessant flow of virtual needs, symbolized as quantitative scales varying from 'full' to zero. If neglected, the consequences were severe. In fact, a pet not properly looked after could effectively 'die' (a condition set to be irreversible in the first versions of the toy). As the philosopher Žižek notes:

the uncanny enigma of the *Tamagotchi* resides on its power to drive the owner/player to feel the appropriate emotions – responsibility, affective attachment, loss and so on – in spite of the complete awareness that there is nothing beyond the screen and that the representation is a radical reduction of imaginary resemblance to the symbolic level.³⁸

After their appearance and success, *Tamagotchis* became an influential reference for later simulation games. Will Wright's *The Sims* appears particularly relevant in this analysis. This game, described as 'a cross between a doll house, a Tamagotchi and the television programme Big Brother'³⁹ simulates an idealized modern suburban environment in which players interact with a group of semi-autonomous agents from a 'god-like' perspective. As with *Tamagotchis*, the player is responsible for satisfying the characters' needs, expressed as a series of bars covering basic and social parameters. Notably, in *The Sims* the single-entity engagement from the classic *Tamagotchi* is extended to a group of characters, generating situations much more difficult to predict and resolve. While with *Tamagotchis*, the player is required to keep the flow of needs in check with simple timely performed operations, in *The Sims* the needs and subsequent player actions may vary depending on the relationship of agents between each other and with their environment.

Using these examples as references, a series of NPCs were implemented in the Anglo-Saxon game. These characters had no virtual representation in the three-dimensional

game world, but interacted with the player through text-based conversation systems accessible through the game's Graphical User Interface. While most of the characters have no blood relationship with the player-character, two of them – a small son and teenage daughter – were presented as 'family members', who could take care of everyday tasks as long as they were provided with the basic means of subsistence. Although the conversations and narrative events with these characters were completely fictional, they were constructed under the assumption that children in the Anglo-Saxon period were considered psychologically different from adults and, in general, were loved by their parents, which are notions supported by historical evidence.⁴⁰

Conclusion

In this chapter, I have explored how the ideas about the landscape that Ingold synthesizes as the 'dwelling perspective' can be expressed through video game technology, using the immersive and interactive properties of the medium to 'bring the player in' a virtual historical world. Through this analysis, I have raised the argument that, compared with previous non-interactive media, video games are better suited to communicate the defining concepts and relationships from human inhabitation that Ingold deconstructs in his analysis of Bruegel's painting *The Harvesters*. Video games have the ability to generate worlds able to be influenced by the actions of players, non-player agents and environmental forces, and hence they can 'bring to life' taskscapes, allowing players to become virtual inhabitants of the simulated world. In spite of these undeniable advantages, the quantitative bias of the medium renders its use problematic for communicating meanings that cannot be expressed only in numerical form. A sense of place also depends on establishing an affective connection with the environment, people and objects, which can be problematic to encode and communicate through procedural algorithms. Arguably, the recognition of this fundamental part of our relationship with landscapes requires the integration of systems capable of conveying meanings in the form of stories, designed to make the player 'care' about the world and what happens in it.

The perspectives discussed in this chapter can be of special interest to historians and archaeologists exploring ways to translate historical knowledge or data into games worlds and virtual heritage environments. As argued, this is not simple nor a direct process; the meaningful communication of historical content in a video game demands a thorough understanding of the conventions and affordances of this medium, beyond the simplistic translation to conflict mechanics. In this sense, the ideas outlined here can be helpful to researchers from the disciplines studying the past to work with game designers, or to become game designers themselves in the effort of creating historical game environments.

Notes

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- 6 Ibid., 186.
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- 8 Ibid.
- 9 Ibid., 201.
- 10 Ibid.
- 11 Ibid., 202.
- 12 Ibid., 199.
- 13 Bede, *The Old English version of Bede's Ecclesiastical History of the English People*, trans. Thomas Miller (London: N. Trübner, 1898). Available online: <https://archive.org/details/oldenglishversio04bede/page/n5/mode/2up>, accessed 28 March 2018.
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- 20 Denis Cosgrove, 'Prospect, Perspective and the Evolution of the Landscape Idea', *Transactions of the Institute of British Geographers* 10, no. 1 (1985): 55.
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- 23 Yi-Fu Tuan, 'Place: An Experiential Perspective', *Geographical Review* 65, no. 2 (1975): 152.
- 24 Matt Burdette in a blog post describes this lack of presence in virtual environments as 'Swayze effect', in reference to the 1990's film 'Ghost'. The term describes the sensation of not having a meaningful tangible relationship with the represented social and physical surroundings, despite being immersed in the virtual world. Matt Burdette, 'The Swayze Effect', *Story Studio*, 18 November 2015. Available online: https://www.oculus.com/story-studio/blog/the-swayze-effect/?locale=en_GB, accessed 21 April 2020.
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- 26 James Gibson, *The Ecological Approach Visual to Perception* (Boston, MA: Houghton Mifflin, 1979), 254.
- 27 Ingold, *The Perception of the Environment*, 205.
- 28 Espen Aarseth, 'Playing Research: Methodological Approaches to Game Analysis', in *Proceedings of the Digital Arts and Culture Conference* (Melbourne: MIT School of Applied Communication, 2003), 2.

- 29 Gonzalo Frasca, 'Simulation versus Narrative: Introduction to Ludology', in *The Video Game Theory Reader*, eds Mark Wolf and Bernard Perron (New York, NY: Routledge, 2003).
- 30 Ingold, *The Perception of the Environment*, 195.
- 31 Ibid., 207.
- 32 Erik Champion, 'Defining Cultural Agents for Virtual Heritage Environments', *Presence* 24, no. 3 (2015): 179–86.
- 33 S.T.A.L.K.E.R.: *Clear Sky* (GSC Game World, 2008) implemented characters with complex A-Life systems, which enabled them to carry on with their simulated lives at all times during the game.
- 34 Shawn Graham, 'Review of Evolving Planet [game]', *Internet Archaeology* 42 (2016). Available online: <https://doi.org/10.11141/ia.42.4>, accessed 28 March 2018.
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