



# Engaging Place: a Framework for the Integration and Realisation of Virtual-Reality Approaches in Archaeology

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"The resulting 3-D experience has to be seen to be believed: *that* is what virtual reality is all about"  
Renfrew 1996, 7 (emphasis added)

## Abstract

As archaeologists have embraced and welcomed developments in information technology and visualisation, they have found themselves working increasingly under the auspices of Virtual-Reality. Despite this enthusiastic uptake, it can be argued that as of yet, archaeology has failed to realise that as a defining term, Virtual-Reality is far from unproblematic. As a direct result, questions as to what we *mean* by Virtual-Reality, and what our expensively assembled models *represent* have been left largely unexplored. The present discussion aims to address precisely these questions, by taking a critical look at the term Virtual-Reality. Current dominant conceptualisations and definitions of Virtual-Reality will be characterised, along with the frameworks and attitudes they foster, and the notional Virtual-archaeology they imply. Following on from this, an alternative developmental trajectory will be suggested that better exploits the unique capabilities of such systems in helping to facilitate archaeological interpretation. Issues such as authenticity, the representation as fake and role of Virtual-model as static end-product will be investigated, and an alternative definition will be offered and explored which has enormous significance for the future realisation of the technology within the broad context of archaeological research.

## 1 Introduction

### 1.1 Preamble

As a term, 'Virtual-Reality' has become ubiquitous within all aspects of contemporary Western society, synonymous with a developing generation of photo-realistic and fully interactive computer-generated environments. As a discipline, archaeology has been quick to begin to explore the potential of such developments through a number of initiatives and innovative case-studies. These have involved the generation of highly complex, and it should be added *costly*, models such as Virtual-Stonehenge, and continued research into more egalitarian technologies such as the Virtual Reality Modelling Language (VRML) extensions to the World Wide Web (WWW). The result has been a steady flow of innovative research papers and the recent appearance of more weighty mainstream tomes, such as "Virtual Archaeology" (Forte 1996).

As archaeologists have embraced and welcomed such developments in information technology and visualisation, they have found themselves working increasingly under the explicit auspices of Virtual-Reality. Yet despite this enthusiastic uptake, it can be argued that as of yet, archaeology has failed to face up to the fact that as a defining term, Virtual-Reality is far from unproblematic. As a direct result of this uncritical acceptance, fundamental questions relating to issues such as what we actually *mean* by Virtual-Reality, and what our expensively assembled models truly *represent* have been left largely unexplored.

The present discussion aims to address precisely these questions, by taking a critical look at the term Virtual-Reality. This conceptual investigation will be framed and contextualised with reference to a case-study involving research into potentially the most exciting and accessible of all of the current wave of developments in Virtual-Reality, VRML. Through an explicit discussion outlining the issues which prompted and directed this study, an attempt will be made to characterise current dominant conceptualisations and definitions of Virtual-Reality, along with the frameworks and attitudes they foster, and the notional Virtual-archaeology they imply. Following directly on from this, the conceptual underpinnings of existing archaeological applications will be shown to be lacking, and an alternative developmental trajectory will be suggested, that better exploits the unique capabilities of such systems in helping to facilitate archaeological interpretation. During the course of this discussion issues such as authenticity, the representation as a fake and role of VR model as desired end-product will be investigated. Building upon this, an alternative definition of Virtual-Reality will be offered and explored which has enormous significance for the future realisation of the technology within the broad context of archaeological research.

### 1.2 A brief background

This attempt to outline a developmental framework for archaeological Virtual-Reality is embedded within a wider exploration of the role that can be played by virtual-modelling applications, in close association with GIS-based approaches, in bridging developments in archaeological

theory and practice. By way of general clarification, in the context of the present discussion, the term Virtual-Reality is used as a generic 'blanket' descriptor to refer to the growing range of dynamic-interactive visualisation approaches currently finding increasing application within archaeological research. A number of introductory case-studies, including the Peel Gap study that will feature here, have already been published in detail along with an explicit, worked methodology (Gillings and Goodrick 1996). In the context of this discussion the emphasis will not be on replicating this information but instead building upon it, by addressing more directly a number of background issues. These are namely *what drove the study* and *what the resulting models represent and, more importantly, do not represent*. Each of these issues will be discussed in turn.

## 2 Putting theory into practice

### 2.1 What drove the study - why virtual reality?

Let us begin by looking at the factors that prompted the original decision to explore the potential of Virtual-Reality based approaches, in effect addressing the question: *why attempt to expand the GIS-approach through the avenue of virtual modelling?* The principal motivation derived from a growing interest in issues relating to embodiment, process and the social nature of space and time, as fore-grounded in a number of recent theoretical debates by researchers such as Barrett and Tilley (Barrett 1994; Tilley 1994). This interest was itself driven by the growing realisation that a number of clear theoretical shortcomings existed in my own ongoing research into person-environment relations in the complex prehistoric flood-plain landscapes of north-eastern Hungary. Here, the traditional functionalist and deterministic interpretive frameworks offered by the generic-GIS proved increasingly sterile as more experiential and embedded notions of Being and Dwelling, such as those discussed by Thomas and Ingold, came increasingly to the fore (Thomas 1996; Ingold 1995).

In wanting to accommodate such conceptual approaches into my GIS-based analytical framework, I became deeply dissatisfied with existing attempts within the field of archaeological-GIS to identify, challenge and overcome a perceived theoretical inertia. This sense of stasis has been discussed exhaustively over the last three years and I do not want to repeat debates in any detail here, suffice to say that the inertia manifested itself most clearly as an environmental bias, whether in the guise of hard determinism or soft possibilism. As I have argued elsewhere, arguments in defence or support of an environmental primacy in GIS-based work, appeared to be caught up with the symptoms rather than the cause, failing to address or acknowledge the existence of much more fundamental underlying dualisms such as that enforced between culture and nature (Gillings, forthcoming). The dominant alternative to determinism, championed by those calling for a more "humanised" GIS, took the form of viewshed analysis. As an approach this also seemed far from unproblematic, being dominated by an uncritical visualism and enforcing an implicit dichotomy between a static, privileged observer and that to be observed. Following on

from the work of the psychologist Gibson, and the elaboration of his ecological approach to perception within the spheres of anthropology and geography, I wanted to structure my ongoing investigations into people and landscape from the perspective of people as active exploring animals situated in an environment (for a useful summary of Gibson's approaches see: Ingold 1992, 45-8; Rodaway 1994, 19-22).

This not only entailed a re-questioning of dualisms such as culture : nature, but also stressed the active and mobile nature of multi-sensual perception and the necessity of foregrounding embodiment. In an attempt to move beyond the see-saw arguments regarding Determinism, and the limited and far from unproblematic platform of viewshed based analyses, the decision was made to move in a different direction. This comprised an attempt to incorporate the notion of an active, mobile, situated observer into my GIS analytical environment. In an attempt to achieve this, research was initiated with the aim of exploring the potential synergy that could be harnessed from integrating developments in affordable visualisation and virtual-reality technologies and GIS.

The key point to highlight is that the investigations into the potential of Virtual-Reality were driven by an explicit problem and constituted from the outset, a clear attempt to bridge developments in theory and practice. In addition, in developing and exploring methodologies a number of criteria were brought to the fore: the approaches developed had to be flexible and affordable, the latter being partly contingent but also inexorably tied up with the fact that they also had to be reproducible by, and communicable to, the wider community of archaeologists and interested parties.

### 2.2 The Hadrian's Wall tower at Peel Gap

To illustrate how these aims and objectives were realised in practice I will take a brief look at one of the first case-studies undertaken, focusing upon the enigmatic Roman tower of Peel Gap. As mentioned earlier, the precise methodologies employed in the generation of the various models and visualisations to be discussed, have been published in detail elsewhere and I will only attempt to briefly summarise them here. The Tower at Peel Gap comprises a small, rectangular structure which was added to the back face of Hadrian's Wall shortly after its construction in the early second century AD. For a simple account of the feature itself and general locational and structural details concerning the broader context of Hadrian's Wall see Johnson (1989:61-2). In its size and ground plan, the structure resembles most closely the regular series of turrets that characterise the length of the wall. These turret features have traditionally been interpreted as observation posts, functionally located so as to maximise the views out beyond the frontier and to either side along the line of the Wall. The location of the Peel Gap tower however, appears to directly contradict this received notion of optimum defensive location, as it is nestled neatly at the base of a narrow pass through the dramatic crags which dominate the central sector of the wall. This choice of location appears to be deliberate and is in preference to more defensibly suitable high ground situated immediately to either side. The

location of this tower feature has long proved a source of curiosity to Hadrian's Wall scholars and the question as to its defensive utility comprised the subject of the case-study, a visibility analysis of the tower feature.

In practice a detailed micro-topographical survey of the immediate landscape of the tower was undertaken and a detailed record was made of the footprint of the Wall and related features, such as the course of the contemporary road - the Military way, as they crossed the study area. The survey derived data was then imported into the Arc/Info GIS where a 1m resolution digital elevation model (DEM) was constructed and a viewshed calculated from the top of the tower, assuming a combined tower and look-out height of 11m. The resulting viewshed served to confirm earlier reservations as to the strategic significance of locating an observation post in this position, as the identified zone of visible ground was heavily restricted, focusing not upon the lands beyond the frontier but instead upon the immediate surroundings of the pass itself and the area to the rear of the Wall.

Although undoubtedly highly useful, the viewshed as generated had a number of shortcomings, particularly given the overall aims of the research exercise. The analysis failed to incorporate the notion of the observer as mobile and situated, instead the viewshed was static, serving to abstract a dynamic and uncertain perceptual act into a simple, well-defined projected zone, located unambiguously upon a flat projected map. Taking the GIS-based viewshed not as an end-product but as a first step, attempts were then made to enhance and complement it through the application of visualisation and Virtual-Reality based approaches. In practice, the line of the wall and tower foundations were used as a template from which a basic structural reconstruction was undertaken in CAD. This was simply rendered and a number of animation sequences were generated. These served to re-create the view yielded by a gentle 360 degree rotation by a hypothetical observer located atop the reconstructed tower. As well as exploring the 'view-from', the effects of 'viewing-to' were explored by moving an observer past the structure along the course of the Military Way. The results were fascinating. In the former case, although the view out to the area beyond Hadrian's Wall was indeed seen to be blocked, as indicated by the GIS-based study, what was not at all obvious was the way in which the course of the Military Way dominated the view to the rear, often tracking the visible sky-line. In the case of the 'view-to' what was most striking was the suddenness with which the tower first appeared out from behind the looming bulk of the crags.

These reconstructions and animation sequences served to situate the observer and incorporated a degree of mobility, but they were still prescriptive. The final, and critical stage was to generate a representation whereby the observer was able to freely engage with the re-creation, choosing their own paths through, and their own viewing points within, the landscape. In addition, an important proviso was that observers should not only be able to freely engage with the representation, but they also had to be able to obtain, view, modify and alter it, treating it not as a definitive end-product but as a manipulable medium that could be incorporated into

their own analytical environments. This would enable our tendered interpretation to be scrutinised and new interpretations to be formulated. As a result the decision was taken to implement the re-creation using Virtual-Reality based techniques, specifically VRML, with the resulting model being freely distributed via the WWW. The landscape could now be viewed from anywhere within it. Observers could explore the views from the tower or approach the wall from within the landscape actively seeking a position on the crags where you could see over the wall to the mysteries beyond. Functional factors such as the possibility of a Wall-top walkway could be assessed and the effects of altering the reconstructed tower height explored dynamically.

In each case the visualisations and Virtual-Reality model added further dimensions to the Boolean viewshed yielded by the traditional GIS-based study. These are best viewed not as steps in a procedure, nor as evolutionary 'stages' - in effect progressively more useful replacements for one another. Instead they should be regarded as a group of complementary approaches which as a whole offer a unique methodology for looking in a more flexible and situated way at the functional status of Hadrian's Wall with respect to its direct landscape context.

<p>Having generated our Virtual models how do we, and the wider public perceive them?</p>	<p>Having generated our virtual models what do we then do with them?</p>
<p>Are they realistic? Are they faithful? - Here we encounter issues relating to the status of reality, authenticity and the potentially problematic status of the representation as fake.</p>	<p>The VR representation as end-product, an ingenious picture to be viewed and studied, as opposed to the VR representation as interpretive device, open to negotiation, exploration and the principles of montage and collage.</p>

Figure 1: The underlying Issues.

### 2.3 What the resulting VRML model *is* and what it *is not*

Having looked briefly at the factors that prompted an original investigation into the utility of Virtual-Reality and how this was realised in practice, it is important to move on to consider the principal topic of the current discussion, and attempt to clarify what precisely the results of the Virtual-reality modelling component of the exercise represent and, I would argue more importantly, what they do not represent. My contention here will be that whatever they do represent it is not reality, nor is it in any way an end-product.

To explore this proposition I intend to pose a number of fundamental questions and examine a number of important

concepts. For the purposes of structuring discussion these can be grouped under two broad thematic headings (see Fig. 1).

### 3 The dominant perception

#### 3.1 What is virtual reality?

One of the principal questions asked of any computer-based representation, by archaeologists and the general public alike, is a variation of '*How realistic is it?*'<sup>1</sup>. Implicit in this question is a degree of suspicion, and the notion that the model is in some way trying to deceive, fool or seduce the viewer. To be able to adequately explore this phenomenon, we must take fundamental issue with the term Virtual-Reality itself. As mentioned in the introduction, the term is ubiquitous within all aspects of contemporary Western culture, yet as a term it is far from unproblematic. It finds itself being used increasingly in a host of disparate contexts, yet rarely is it explicitly theorised. I would argue that the uncertainties arising from this state of affairs are particularly acute in the context of archaeological applications. As a result, in discussing how we and others actually perceive our carefully generated representations, we must first establish what we actually *mean* when we define a given re-creation or model as Virtually-Real. In effect pose the question: *what is virtual-reality?*

In his discussions as to the mathematisation of experience, the historian of Science, Gray, proposed two definitions. The first, and dominant definition, positions Virtual-Reality as a *manufactured deficiency*. This suggests that a Virtual-Reality represents a reality that is lacking, in Grays words 'almost but not quite real'. The second definition positions it instead as a *manufactured intensity*. Here the suggestion is that a Virtual-Reality represents a reality that 'is more intense and concentrated than so-called everyday nature' (Gray 1995, 343-6). A statement that we could perhaps simplify to read *more real than real*.

Looking more directly to the field of archaeological research, the most clear and influential definition has been that provided by Reilly in his seminal paper "Towards a Virtual Archaeology" (Reilly 1991). Here Virtual-Reality and the virtual-archaeology it implied were defined in terms of the notion of a surrogate. The Virtual-Reality model serves to act as a replacement for an original. The closeness or "faithfulness" of the approximation of any given model to its original referent is dictated by the quality and volume of data that has gone into its generation. This is implicit in the pioneering work of the Furness Abbey project published in the same volume, where ground-plans and traditional 2-D archaeological drawings were used to re-construct and model portions of the abbey on a meticulous stone-by-stone basis (Delooze and Wood 1991). This approach has been refined more recently by Bayliss in his stunning reconstruction of the Basilica church of the Alacami in southern Turkey. Here a detailed combination of texture mapping and architectural reconstruction have been used to model the entire structure of the building (Bayliss forthcoming). In each case the re-creation is achieved through the painstaking manipulation and re-assembly of the basic units of architectural detail. The issues of

faithfulness, realism and authenticity are addressed through ever closer attention to recording, the optimisation of data collection techniques, and the fine-detail of model construction<sup>2</sup>. In both examples the Virtual reconstruction is seen to stand in an inferior position to an original referent, with the degree of closeness related directly to the quantity and quality of information put into it. Simply put, the better and more optimised the data used in its construction, the more faithful the Virtual model is, and the closer it comes to the reality it seeks, or purports, to represent. In addition, as a result of this notion of the Virtual-Reality model as a painstakingly sophisticated surrogate, the reconstructions run the risk of being reified, becoming in effect end-products, finished, completed, free-standing and there to be visually devoured. As suggested in the introductory quote, ingenious pictures but pictures nevertheless. This is in opposition to the reconstructions as flexible components in a much wider, on-going process, open to negotiation and manipulation.

As such, this dominant archaeological interpretation of Virtual-Reality parallels closely Gray's notion of a manufactured deficiency, with the Virtual-model taking the form of a doppelganger, or surrogate, which is as faithful a replica as possible but somehow, somewhere, lacking. Underlying the definition offered by Reilly and the examples cited, is the idea of an attainable, tangible reality to which the virtual representation, or surrogate, aspires and therefore against which it invites comparison and can in some way be tested and compared. On this point it is interesting to note that in studying 'Virtual-Stonehenge' it could be argued that the observer-explorer becomes aware of the painstaking attention to detail and accuracy that has gone into its production not when moving amongst the stones themselves, but instead when they encounter the everyday familiarity of the underpass, information boards, turnstiles and post-box of the visitors centre, which they have already repeatedly encountered at Stonehenge and in a host of other routine daily contexts<sup>3</sup>.

Assuming that this proposition is valid, in the case of an extant structure, whether the Alacami or Stonehenge turnstile, you could argue that a tangible original does in fact exist. With the majority of archaeological representations, however, whether of built structures or the very landscape itself, there is no tangible referent.

Looking to the Peel Gap case-study, beyond some neatly re-pointed foundation stones, there is no reality against which the representation can be tested or to which it can aspire. We could argue that what reality there is resides wholly within the confines of the representation itself. We have generated a wall and a tower rather than offered up a faithful copy. Nor does it represent an end-product, a completed and free-standing entity presented to the observer for interpretation. The re-creation is flexible and shifting and observers are actively encouraged to manipulate and re-negotiate our tendered representation. This is a point that will be returned to later when we begin to discuss the status of a given Virtual model not as an end-product but as an ongoing dialogue.

What is clear is that there are a number of fundamental problems associated with the acceptance of, and adherence

to a dominant definition of Virtual-Reality as manufactured deficiency. In what sense are our archaeological representations and re-constructions lacking and how are we to evaluate them? In addition, by enforcing the notion that a given Virtual-model aspires to the 'real' we focus attention not on the Virtual-representation as a flexible interpretive device, but instead run the risk of exhausting ourselves on issues intimately bound up with faithfulness and authenticity, such as suspicion, deception and the problematic status of a given representation as fake.

What I intend to argue here is that in the context of archaeological Virtual-Reality models and dynamic-interactive visualisations, whether highly complex and reified such as the Alacami or simple and negotiable such as the Peel Gap tower, the term Virtual-Reality as traditionally understood and applied is misplaced and misleading. Far from providing archaeology with a valid and all-encompassing framework within which to develop and explore approaches, the uncritical adoption of the term Virtual-Reality could instead serve to marginalise such approaches, by restricting the extent of their application and clouding and muddling their true utility. As the Phenomenologist Dovey has argued in a broad discussion as to the nature of authenticity and the replication of environmental meaning, approaches such as the archaeological tendency to characterise Virtual-representations as surrogates, i.e. manufactured deficiencies, engenders an investigative operation on the part of the observer. There is an active search for clues indicating authenticity, which itself leads to a sense of empirical testing rather than an openness to disclosure of the represented place. This attitude of mistrust in turn feeds a growing sense that the Virtual-representations have to become increasingly sophisticated in order to, in Dovey's words, "thwart investigations and capture real meanings" (Dovey 1985, 38-9). As a result we will rapidly find ourselves caught up in an increasingly sophisticated, but ultimately circular, dead-end, that runs the risk of relegating Virtual-Reality research to the marginal fringes of archaeological investigation.

Assuming then that the term Virtual-Reality, with its dominant connotation of manufactured deficiency is of limited value to archaeology what is the alternative? Here I would like to build upon and adapt Gray's notion of Virtual-Reality as manufactured intensity. Looking to the work of critical theorists such as Baudrillard and Eco, rather than adopting Virtual-Reality as a blanket descriptor within the field of computer-based archaeological re-creation, a particular reading of the term 'hyperreality' may be more appropriate.

### 3.2 Hyperreality

"Hyper-reality is a slippery term."

(Rodaway 1995:244)

At this point it would be sensible to provide a clear definition of hyperreality, however, the first thing to realise about the term is that it is highly provisional, continually metamorphosing and thus works tirelessly to elude concise definition (Rodaway 1995:244). The term was foregrounded by Baudrillard in the context of discussions

relating to modes of signification and a perceived breakdown in the relationship between signs and original referents. The notion of the hyperreal developed in his claims that within modern society the existence of reality was no longer guaranteed by the signs it emitted, instead signs were now seen to construct the real, as simulations. To Baudrillard a simulation did not provide an equivalent for a given reality nor reproduce it, instead the simulation generated it. To quote Baudrillard, "Abstraction today is no longer that of the map, the double, the mirror...Simulation is no longer that of territory, a referential being or substance. It is the generation of models of a real without origin or reality: a hyperreal. The territory no longer precedes the map, nor survives it. Henceforth, it is the map that precedes the territory.... it is the map that engenders the territory" (Baudrillard 1983: 2)

In discussing formulations of hyperreality, to Baudrillard the 'real' became nothing more than that it is possible to reproduce and is always *already* reproduced. The hyperreal became simply the *more* real than real (Baudrillard 1983: 146; Horrocks and Jevtic 1996:109). Commentators disagree as to whether hyperreality is best treated as a concept or a tool, and more significantly for archaeology, whether it represents a tangible thing that resides in specific places, for example Disneyland, Jorvik and Virtual-Stonehenge, or a process that exists in the relationship between subjects (for example archaeologists) and objects (re-evocations such as Jorvik and Virtual-Stonehenge)<sup>4</sup>.

The former is best illustrated by studies such as Eco's observations of contemporary America, and in the archaeological context, Diamond's fascinating study of the Lascaux II cave re-creation (Eco 1986; Diamond 1996, 30-41). Hyperreality as process has been most fully explored by Rodaway in his detailed examination of the mapping of the subject in the context of 'living' heritage museums, such as Beamish, and theme parks (Rodaway 1995, 256-63).

Such a distinction is perhaps illusory. In the context of the present discussion hyperreality is best thought of as both, being embodied within particular locations and situations, which are themselves part of a broader on-going process of experiencing the world.

Far from suggesting a wholesale replacement within the context of archaeological research of the term Virtual-Reality with that of hyperreality, for reasons which will become clear when we begin to discuss the issue of authenticity, the central theme I wish to extract from the above discussion concerns the recurring characterisation of the hyperreal in terms of simulations which are generated *of* the real without origin or reality, the only reality being that generated by the simulation.

Returning to the example of the Furness Abbey project, in discussing why the model had been created, one of the clear benefits of a virtual model over a traditional set of abstracted plans, elevations and reconstruction drawings was identified by the authors as the facility to actually get inside and walk around the reconstructed buildings. This would give the observer a greater sense of "being there" (DeLooze and Wood 1991, 144). In light of the preceding discussions into Virtual-Reality as manufactured intensity and the role of the

status of a given re-creation as hyperreal the question we must now ask is being precisely *where*?

The simulations are more real than real in that they provide a vision which, quite literally, gives you more (Rodaway 1995, 246). This, I feel, is the key to a re-definition of Virtual-Reality that will enable us to overcome current tendencies towards increasing methodological refinement and reification, and more fully realise the potential of such techniques and approaches within mainstream archaeological research.

### 3.3 The issues of authenticity and faithfulness.

If then, a definition of Virtual-Reality is taken which emphasises the status of any given model not as a manufactured deficiency but as an intensity, what becomes of the issue of authenticity and the investigative operation this encourages in the observer, that I have claimed is inexorably tied up with the former conceptualisation?

Taking the discussion of hyperreality to its logical and extreme conclusion we could argue that the issue simply does not exist, or that it is a non-issue. Questions relating to authenticity and faithfulness no longer have meaning as, to quote Baudrillard, "...illusion is no longer possible because the real is no longer possible" (*ibid.* 246). I do not, however, intend to side-step the issue of authenticity by hiding behind a veneer of postmodern rhetoric. The issue is critically important to an interpretive archaeology. As Shanks has argued in his recent discussion of photography and archaeology, uncertainty and doubt are the roots of interpretation. Meaning can only come through embracing both certainty *and* doubt, making connections and exploring contexts (Shanks 1996, 79-80). However, in discussing the authenticity of a given model, rather than stressing the issue of visual approximation, intimately bound up in ideas of manufactured deficiency, I intend to follow Dovey in asserting that authenticity is not a property of form, but instead is a property of process and a relationship or connectedness between people and their world. Dovey asserts that authentic meaning cannot be created through any manipulation of form, as authenticity is the very source from which form gains meaning, a position echoed by a number of recent archaeological investigations into agency, practice and monumentality, for example Barrett's study of Avebury (Dovey 1985, 33; Barrett 1994).

Returning to the examples mentioned earlier, however architecturally faithful the Virtual re-creations of Furness abbey or the basilica church of Alacami are, the virtual-stones do not carry mason's marks, the virtual-floor the shine of a thousand footfalls nor is the virtual-interior cluttered with the bricolage of everyday social practice. And the vital point is that painstakingly adding them is *not* the answer as it will make *no* difference to the issue of authenticity. What Dovey argues is that the critical difference between an original and its representation is not in the detail of form but in the richness of environmental, or experiential, depth. He illustrates this with reference to a "fake" beach recently constructed in the Arizona desert. The beach has waves and sand but no crabs, sharks, undertow, driftwood, shells to be found, rockpools to explore, sea breezes or salt air (Dovey 1985, 39-40). Whereas the

original is a learning environment that fully embodies a sense of encounter, experience and process, the representation lacks spatial and historical depth, diversity and variation. This echoes Shank's distinction in the realm of archaeological photography between Naturalism and Realism. Here Naturalism refers solely to the replication of external features whereas Realism is more concerned with extended metaphors, patterns of association and allegory. To quote Shanks "A realistic representation is not only, or necessarily naturalistic" (Shanks 1996, 78).

The point here is that any given Virtual-representation can never be authentic. The considerable efforts currently being expended in incorporating ever more detail into models, whether through the use of individual bricks and stones rather than simplified macro-entities, or the application of highly complex textures, achieve little more than the generation of an even more fastidious investigative attitude on the part of the observer. This is summarised neatly by Dovey in his assertion that "...authenticity has the indigenous quality of being inborn. The problem lies not in the searching, which is genuine, but in the misplaced belief that authenticity can be generated by the manipulation of appearance" (Dovey 1985, 47). Saying that a given re-creation is inauthentic is not, however, to say that it is either actively deceiving us or that it is not useful. A beach located in the middle of a desert is not in a position to fool anybody but it does not stop it being a nice place to spend an afternoon. Neither is it to be seen as advocating and endorsing some naive form of judgemental relativism (for a useful discussion on the issue of relativism see Shanks and Hodder 1995, 19). This brings us onto the last of the issues that need to be addressed, having generated a Virtual archaeological model what do we then do with it?

### 3.4 The role of virtual-reality in archaeological research.

If we accept that far from directly reflecting or aspiring to an original referent or "reality", the only reality is that generated by the models themselves, and in addition acknowledge that the issue of authenticity is concerned not with direct comparison and evaluation of form, but with engagement and process, we are in a strong position to move forward. If we regard our representations, however fine the detail that has gone in, as always critically lacking depth, we can begin to move beyond attitudes of suspicion and the rampant and fastidious empiricism they foster.

The dominant characterisation of Virtual-Reality as a deficient surrogate prompts an investigative procedure on the part of the observer which in turn leads to ever more refined attempts to thwart it. And so the cycle goes on. We must realise that the negative connotation of deception arises directly from the notion that our carefully constructed representations *should* and faithfully *do* represent the past, which is in turn a legacy of our dominant characterisation of Virtual-Reality as a manufactured deficiency. Our Virtual-representations are fakes but they are not trying to deceive us into thinking anything otherwise, and this in no way diminishes their utility to us as archaeologists as catalysts for exploration and interpretation. Looking to the Peel gap case-study, the Virtual model and related visualisations were

driven by a problem. This was simply, '*if a tower, connected to a continuous stretch of walling was located here, what could be seen from it*', and they contributed greatly to the exploration of this problem area. The exercises were not driven, or structured around a desire to '*re-create a stretch of Hadrian's Wall*' which they fail, and will always fail to do comprehensively.

When we come to exploring arguably the most fundamental issues of all, what are the models for, and how do they help us in the process of interpretation, we often find that far from embracing the Virtual-models as a new means of exploring ideas, we have exhausted ourselves in addressing and maintaining this cycle of suspicion. As a result the models are left as little more than ingenious images to be viewed and consumed. To quote Renfrew from his introduction to the recent volume 'Virtual Archaeology' "As he (the editor) puts it, the aim is 'to make archaeological information... visually real': the great quantities of data now available must actually be made to inform us, not just sit in a data bank" (Renfrew 1996, 7). They become a closed end-product, something passive to be gazed at, whether from without, within, a fixed viewing point or a flexible one. In effect they become the passive images rather than objects of analysis highlighted by researchers such as Molyneaux (Molyneaux 1996). Building on the recent work of Shanks, and his translation of the passive photograph into the active Photowork, Virtual-representations can instead serve to facilitate new modes of engagement and interpretation. The emphasis must be on process rather than the critical appraisal of mere form. In this sense, in the case of the Peel Gap re-creation the sense of frustration in not being able to see over a section of wall to the other side becomes as important as the attention that has gone into 'realistically' weathering the texture of the stones blocking our view. The Virtual-models are there to be worked with and on rather than consumed, and can and must be negotiated, modified and engaged in the exploration of connections and context inherent in the twin processes of collage and montage that Shanks sees as central to a developing mode of archaeological practice (Shanks 1996, 83-4).

#### 4 Conclusions

Virtual-Reality applications within archaeology represent a growing and highly fertile field of study. At present however, applications are under-theorised, dominated by a received notion of Virtual-Reality that emphasises the role of Virtual models as deficient surrogates. It has been argued that whilst such an interpretation remains in place the true

utility and potential of such developments to the wide field of archaeological research will not be realised, as time and effort is expended not on analysis and interpretation but on ever increasing visual sophistication.

The suggestion here is that far from treating our models as deficient surrogates a more productive approach is to characterise them as manufactured intensities, emphasising their hyperreality and inauthenticity and encouraging archaeologists to explore their true potential in the study of issues bound intimately with engagement and process. Developments in Virtual-reality have the potential to radically re-orient how we approach, negotiate and interpret our carefully recorded archaeological information and it is crucially important that such approaches are not relegated to the creation of ingenious but esoteric galleries. Rather than a programmatic statement for the development of a Virtual archaeology, the aim of the present discussion has been to highlight a number of limitations and suggest a platform from which applications can more freely develop. The rest is up to us.

#### Notes

1. This assumption was reinforced, in an entirely qualitative way, during a gruelling open-day held at the School of Archaeological studies in the University of Leicester on a chilly day in February 1997. During the course of the day a number of VR models and visualisations, ranging from the most basic to the most sophisticated were exhibited to a seemingly endless stream of field archaeologists, academics and members of the public alike.
2. Contra to Daniel, in his recent discussion as to the importance of solid-modelling, I would argue that this is regardless of whether initial efforts are directed towards the accurate texture-mapping of a simple geometric structure, or the more Lego-based approach advocating the use of solid representations of the original component building blocks (Daniel 1997).
3. As an aside it is worth noting that one of the most striking things about archaeological Virtual-models is the lack of people in them. As a result, wandering around re-creations such as Virtual-Stonehenge can be a very ghostly and unsettling experience.
4. It is interesting to note that authors cannot even decide whether the term should be hyphenated or not. In the present discussion I have followed Baudrillard and Eco in not hyphenating, excepting when directly quoting from other authors.

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