Being in the (past) world: Vermeer, neural networks and archaeological theory.

Bintliff, J.L.; Kienlin T.L.

Version:	Not Applicable (or Unknown)
License:	
Downloaded from:	

Note: To cite this publication please use the final published version (if applicable).

Being in the (Past) World:

Vermeer, Neural Networks and Archaeological Theory

John Bintliff

Abstract: A recent concern in Archaeological Theory has been with questions of Human Agency and the creation of complex Pasts. Attempts to bring together the earlier work of Modernists (New or Processual Archaeology) with their interest in the larger structures of society, and Postmodernists (Post-Processual Archaeology) with their interest in active individuals in the Past, can be criticised for overemphasizing one half of the Structure-Agency interaction. Multiscale approaches in which the Past is seen as underdetermined and unpredictable, yet prone to form post-dictable shapes, have benefitted from older and current work in other disciplines with a strong time-perspective (the Annales School of French historians, Punctuated-Equilibrium Theory associated with the evolutionary scientist Stephen Jay Gould, and Chaos-Complexity Theory which is a powerful stimulus in many areas of scientific research at the moment). This paper will take the insights obtained from the latter group of ideas and introduce a novel element into our analysis of the past – Neural Network Theory, a body of research into how the human mind works which has led to far-reaching hypotheses about how we see and react within the world.

Over the last two decades an exciting convergence has taken place in several disciplines, with its focus on the human experience of materiality. Particularly in Cultural Anthropology, Art History and Archaeology we find a new emphasis on the role of material culture, notably everyday objects and buildings in our domestic or working environments, in reflecting, reaffirming, challenging, or constructing the structures of social life. Exactly how this works, however, has brought forth quite diverse models. At one extreme is the point of view where material culture simply reifies in more permanent form the roles, practices and beliefs of a given society, mirroring it and hence offering us a map of such a community. This was an approach often followed in pioneering research in Social Archaeology during the New Archaeology paradigm of the 1960s and 1970s. In contrast to this passive role, at the other extreme, associated with social constructivism, the potentially fluid activities of the social world are anchored into regulated pattern through the recurrent exposure of members of a community to an ordered local world populated by built environments and artefacts, whose form, placing and design or symbolism provide the meanings of social life to participants. Here material culture is highly active. In a more balanced, intermediate position, we might locate recent proponents of Structuration Theory, where individual people can both modify material culture patterns and be moulded by existing patterns. Criticism of the last viewpoint often focuses on its overreliance

on active agency and an underexplored structure, in archaeological case-studies (Bintliff 2004).

I find numerous problems with these varied formulations, which requires us, I think, to broaden such approaches in order to take account of a series of significant areas of social life in the past, which they fail to deal adequately with. Firstly, History teaches us that events are as much the product of unintentional consequences as of purposeful actions. Likewise, any given generation has but a limited knowledge of transformational processes which impinge upon on it, so that its behaviour is poorly related to the historical circumstances it engages with, including processes due to its own specific social decisions and choices. Whereas some factors are cognisant to contemporaries, others represent evolutionary developments with longer timespans than a human life or even a specific historical culture or age. And yet, human thoughts, perceptions and actions patently act on the course of History, though not always, or everywhere, and certainly unpredictably. One way to simplify this complexity in the weaving of History is to adopt a longer-term approach, focussing on major trends rather than the day to day detail. Steven Shennan's recent work, for example (Shennan 2002), adopts a Darwinian model, modified by Dawkins' theory of memes, in an illuminating way, to read past material culture as an adaptive transformational systematics deployed by societies to enhance their survival and prosperity. I find this a convincing viewpoint, but also feel that the human element and the

Fig. 1: Vermeer's »View of Delft« (c. 1660–1).

world as experienced within human lifespans have necessarily been subordinated to achieve a wider and longer-term picture.

What I feel we still need is a theory or group of models, which take seriously all the powerful approaches and arguments just mentioned briefly, without losing the world of individuals and events, or the larger evolving cultural structures of several centuries or millennia in duration, and somehow allow both endless variation and persistent structure to co-exist. Additionally, this approach should allow both for the world as seen by past participant-observers, individually and as communities, and the past world we can observe with the benefit of hindsight into significant processes wholly or partially hidden from contemporaries. Moreover we should not expect determinism, but neither anarchic structureless human activity, in such an integrating theory. In previous explorations in this theoretical sea, I have raised the potential of the Structural History of the Annales' School of French historians (Bintliff 1991), the Punctuated Equilibrium and Contingency theory of Steven Jay Gould (Bintliff 1999), and Chaos-Complexity theory (Bintliff 1997; 2003). All of these can be linked to offer a resilient intellectual framework for our enterprise of analysing the way people made their world and their world also made them. One new element, which I have already begun to add to this analytical compound, I would like to introduce in the final part of this paper, and this is a major new field in research into human cognition, that of *Neural Networks*. Considerable and justifiable excitement has been generated by this approach within the research community concerned with our mental world, and it has also spilled over into wider studies concerned with social organisation, educational psy-

chology and planning studies. For Archaeology and Material Culture Studies in general it offers a remarkable new dimension of sophistication for our aim in comprehending human life experiences.

But I want to begin this exploration with an unusual form of past artefacts, one which represents a whole world of material culture and indeed a whole past society. I live a short bicycle ride from the Dutch city of Delft, and we shall travel to its 17th century Golden Age, as seen through the images created of it by the painter Vermeer.

What we see in figure 1 is a town dominated by a mercantile, wealthy, middle class, threatened not long before and soon after (see the walls) by expansive, greedy and envious neighbours; it is a confident city-state. Can we do more, meet the insufficiency of these generalities of the medium-term timescale context (fig. 2) in order to confront the individuals of Delft, the human actors, and therefore, in the three timescales of historic processes theorized by the French Annales School, go for the short-term, the world of events or événements? This same master allows us to in his painting in figure 3. We are inside a Delft house – of such a wealthy merchant or manufacturer, or a professional household servicing those classes. Just as the physical townscape before, walls and buildings, the harbour, gave us insights into the economy and the social community, we now also find the painter drawing our attention to the material culture of the scene at the domestic household level – rich but not too numerous furnishings suggest a society that was both widely wealthy but also strongly religious – the tiles, woodwork, dresses, tapestries, etc. Clearly this is a town where the people who the artist mixed with socially, married into, sold pictures to, and who ran the city, valued subdued luxury.

But there should be more – not just an illustration for the Archaeology of Capitalism, the climax of a medium term economic and political cycle of the Annales moyenne durée (fig. 2), peaking in the Golden Age of the South Netherlands in this very mid 17th century. What is going on in this scene, what are these individuals doing that is meant to capture our undivided attention? The pose, occupation and dress allow us to read this scene as a servant giving a letter to her mistress. The look that passes between them suggests this is more than a shopping-list or a newsletter from a distant relative – no, as in other paintings by Vermeer, we are led to believe this is a love-letter.

What strikes commentators about Vermeer's art (e. g. Netta 2001), is the striking way he places us in the scene, close by, a voyeur, observing the intimate

History of Events Short Term	*ÉVÉNEMENTS* Narrative, Political History Events Individuals
Structural Medium Term History	*CONJONCTURES* Social, Economic History Economic, Agrarian, Demographic Cycles History of eras, regions, societies Worldviews, Ideologies (*Mentalités*)
Structural Long Term History	STRUCTURES OF THE *LONGUE DURÉE* Geohistory: 'enabling and constraining' History of civilizations, peoples Stable technologies Worldviews (*Mentalités*)

Fig. 2: Annales' model of timescales.

movements of the bourgeoisie. Another feature characteristic for Vermeer is the powerful sense of silence in his work – a palpable absence of crowds, children, animals, lively communication – the focus thus is drawn to fix our attention on something going on within a person or between two people. And yet how close are we to these individuals' thoughts or words? A final characteristic noted for Vermeer is the deliberate mystery created in each picture – the sense that we don't know what is in the letter, or what is the meaning of the shared laughter between a man and a woman in another indoor scene, or again what portends here the shared glance between mistress and servant? Even if we were to know what one of these individuals was feeling, would it not be more than likely that the other person in the room, or the absent author of the letter, might see the situation quite differently?

I come away from my quest, to see how far we can go in a very well-recorded past society, with mixed impressions as to what we can hope to do in older, and less completely-documented, societies. I feel confirmed in my feeling that the big structures of the longue durée (fig. 2), for example the run-up of growth in this region from the Migration era ports of trade up to the climax mercantile 17th century city society, or the large structures of the middle term – several centuries – economic, social and political cycles, etc. – these can be recognized and reflected in the analysis of its material culture. As for the relationship between these and the world of real lives,

real individual people, real time, real beliefs and thoughts, that of the short term, – much it appears *can* be done with reasonable confidence: the values of the day, the worldview of some groups in the community, are reconstructable – the mentalities stressed by the Annales are just as potent forces as technology or politics. Even the short-lived events – sieges and economic swings, stand a chance of detection – but still, where does this lady's letter come in (fig. 3)?

Bob Layton's (2001) view of pre-Modern art helps us some way forward – a generic interpretation of this scene, or let us say of this symbolic representational artefact, is a more realistic goal than a series of specific meanings at the individual level. Here is a society where gender relations, especially sex and marriage, are not organized by autocratic parents, but normally involve romance, choice, individuality – indeed this could be an illicit affair beyond even the constraints of courtship and marriage. We sense that there is a secret, a heart-throbbing disruption, in the look between the women. But we don't know, and that is one point of the picture – what that secret really is – their look freezes us out, we are *that* close but we can never share that secret.

So I also come away confirmed in my doubts that we should not hope to uncover, even in highly literate and artistic societies, the thoughts, words and deeds of each and every individual – except insofar as they either conform to a recognizable genre of the age – a repetitive behaviour where the clues to a shared mentality become unmistakeable – *or*, rarer to
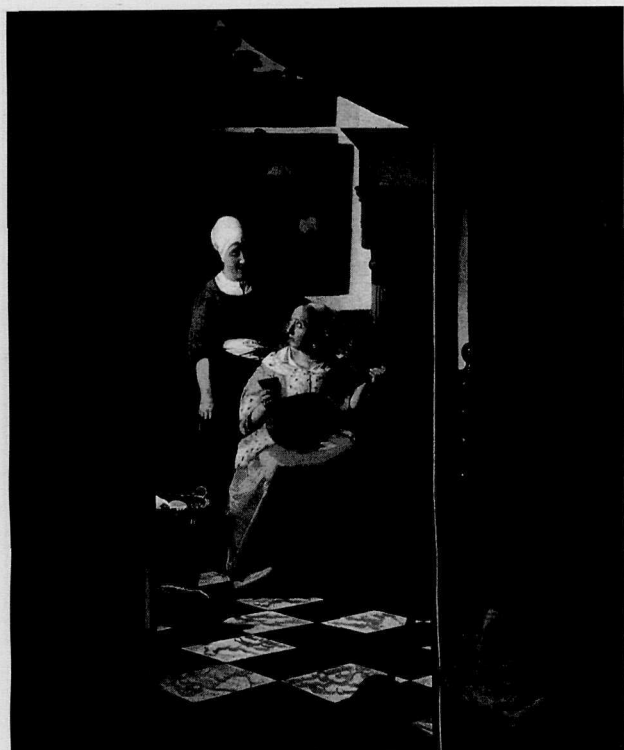
Fig. 3: »The Love Letter« (c. 1669–70).

Fig. 4: »The Sant' Agostino Gate« and its square in Modena.
One of a series of late 18th century street scenes of Modena
painted by anonymous artists. Gentlemen and soldiers are
the dominant groups in this particular scene.

demonstrate from material objects and easier only
where texts and art assist us – where the unusual
thoughts, words and deeds of an individual were note-
worthy enough to become embedded in an artefact, a
special tomb, a structure or sculpture, an archive or
work of literature. Here indeed with Vermeer it is the
first case, where a limited number of works of art
somehow encapsulate large aspects of an entire past
society.

For a second illustration of the insights into
generic group mentalities in the past, which we can
draw by juxtaposing different representations of the
same society, let us turn to another city – half a cen-
tury later, 18th century Modena in N. Italy (fig. 4). In
a clever study combining archival history, parish
records and a rich series of contemporary and well-
peopled paintings of townscapes, Susan Nicassio
(1991) gives us another example where the symbolic
representation of a certain class comes across very
clearly. This clever exercise in Microhistory focuses
on a highly-detailed series of pictures of street scenes
of 18th century Modena, in which historical individ-
uals seem to be depicted. By a striking juxtaposition
of the actual composition of the urban population
from parish and tax records (fig. 5) with the classes,
professions and genders *depicted* as populating the
town, she shows how the street scenes present the
city to the viewer as one of bourgeois gentlemen,

suppressing women, the poor and peasants and even
the ruling nobility. A further analysis of social inter-
actions in these scenes confirms that reading – that
these pictures show us how the male bourgeoisie saw
the world and which social interactions mattered
most to them in the public arena.

And yet Vermeer's Delft is also a selective, person-
alized view from within his middle class set – even
the famous view of its gate is not an attempt to
record the town accurately (fig. 1). Other more doc-
umentary images of the same scene and indeed what
still survives of this view today show us that Vermeer
changed the position and orientation of the build-
ings to make a more pleasing composition. This dis-
cordance between the individual perception and
representation of a past world I find rather intrigu-
ing as well as a challenge to History and Archaeology.
It reminds of why Malinowski is so admired by An-
thropologists – yes, he told them to make spread-
sheets for the rules and structures of a society, but he
was equally fascinated by the way people bend, ma-
nipulate, even flout these rules.

So far I have been exploring the potential and lim-
itations of seeing a past society on the time levels of
processes suggested by the Annales School, whilst
tying in also its emphasis on mentalities to the more
traditional preoccupations of political, social and
economic history. Even if we cannot often see the
role of events, or individual actors in their wider
repercussions until these diffuse to become the com-
mon fate or property of large numbers of people
over a longer period of time – and are only then
highly likely to get registered in the material culture
record of archaeology – the inclusion of the individ-
ual and the short term is there to remind us that this

Fig. 5: Comparison of the social structure of the 18th century Modena population in official records and in contemporary street scenes (from Nicassio 1991: Fig. 11).

is still a major component of both historical stability and also of the motors for change.

My last and central topic is about a new way to understand how individual human actors can be participants, in both active and passive ways, in their lifeworld. Why active and passive? My own reading of History suggests that the individual is indeed as often likely to follow tradition, or the group behaviour of their generation, as to make a novel act which could shift his or her surroundings into a new direction. Moreover, the sources of human action, we learnt from Darwin and Freud (and some have since unlearnt), are not just conscious reason, but as often as not, biological drives, and subconscious desires, perhaps concealed beneath specious conscious arguments. And of course finally when we act, the results are often not what we intended. Given this complexity of human behaviour, it is rather suprising that for most societies studied by History and Anthropology, Malinowski's approach works rather well – mostly people follow certain norms of behaviour while irregularly bending or subverting them.

Two other approaches on view in current archaeological theoretical discourse are relevant – John Barrett (1994) has argued for Structuration Theory as giving us a way to comprehend how individuals and their daily behaviour can matter to the trajectory of a culture or society. Steve Shennan's (2002) more recent elaboration of the »meme« idea of Richard Dawkins stresses, perhaps in a complementary way, that in the longer term it is rather what persists and multiplies that matters – whether or not the creators of a new behaviour or technology or social form planned it this way or not.

Both have a valuable part to play in helping us to feel our way into analyzing past social life and cultural change, but I want to introduce a third approach to our toolbox, one from an unexpected direction – cognitive neuroscience, the technical study of brain functions, and this is the rapidly developing field of applied theory called *Neural Networks* (Anonymous 1991; Carter 1998).

Now perhaps the dominant paradigm of how the human brain works, Neural Network theory runs like this: the key cells in the brain are neurons – we have billions of them – and each receives signals through its several dendrites and can send out a signal from its axon. Each is a memory unit. Information flow between neuron cells is not an online permanent connection, since a gap or synapse exists between in and out connections, and an electrical and chemical firing is required to pass the gap. But when we experience something, the stimulus excites particular neurons or memory cells, and they then become fired up sufficiently to allow a signal to jump across the synapse and excite some neighbouring neurons. Yet the links depend on the existing ties between neurons. Neurons have built up of themselves strong and weak connections to other neurons, not from genetic or other hard wiring but merely on past experience. Experiences of objects and people in contexts, chain together fleetingly but become reflex memories with strong influences on future behaviour when they are constantly repeated or have left a deep impression in the evolving neural network. The more the same experience is reinforced over time, the more often signals run across the same networks, and the thicker and more effective the dendritic connections. Moreover associations of outside stimuli become imprinted in our internal network geometry. And yet we have to allow for unimagineable traffic between our billions of memory cells – even a single thought or bodily movement seems to be accompanied by the simultaneous firing of millions of neurons. Specialists in this field suggest that at birth we have very limited memory pathways, but then a tremendous growth of networks reaches a peak at age 6. Adults tend to reduce density unless they invest in or are exposed to continual new experiences. A widely-accepted theory of human sleep is that its primary role is to switch our conscious surface selves off so the brain can sort out the experiences of the day and classify them into these filing systems of memory.

Why should all this be so exciting for understanding people in society? Firstly, it seems that all our behaviour, conscious or otherwise, is connected to a database within us of staggering complexity. Whatever we see or hear or do is continually linked up in a highly interactive way with all similar sights, sounds and acts we have encountered throughout our lives, but what counts in this endless search procedure is

Fig. 6: Early 19th century picture by Stackelberg of a peasant house in Eleusis, Greece.

Fig. 7: »The Hospitality of Abraham« by Nikolaos Kallergis (mid-18th century), Zakynthos Museum, Greece.

what has been either repetitive, or so traumatic and impressive that dense and thick dendritic connections have built up, the physical reality behind strong memories. We are to a very large extent what we have each individually experienced – no-one is the same. This is why I raised the question earlier about the separate thoughts of the paired individuals in Vermeer's painting. And yet this is restrictive more than supportive for theories of self-conscious human actors ruling their destinies, for we do not dominate the memory bank: awake or asleep, thinking or just observing, the structures of life and the ordered or disordered relations between human beings around us become imprinted whether we like it or not, into the evolving neural networks in our heads. Note that the most lively expansion of networks occurs by age six!

What stimulates me about Neural Network theory is that we now see a very clear way in which societal norms or deviance, stability or change become imprinted in the minds of individuals. The way things are done or said, especially repetitively, become the memory motorways, whilst the rare and unusual will remain like overgrown, rarely-visited woodland paths or even not survive, unless it leaves a deep and broad imprint on the network which receives regular memory stimulus. An illustration of the latter which I find very moving comes from the life of the psychologist Carl Jung. He built a house on Lake Zurich and would sometimes take disturbed patients round the lake in his boat. Once out on the lake with a young female psychiatric case whose source of mental illness had remained a mystery, and because he was a pioneer in the use of art as therapy, he began to sing quietly. As an extraordinary coincidence, the song was one familiar from the girl's childhood, and its sudden reappearance brought back such a flood of healing reminiscences that her

psychic trauma began to retreat and her return to normalcy commenced.

Many of you will probably see a link between this empirically-based theory of the brain and Bourdieu's concept of social norms or habitus, but I hope you will also see how remarkably flexible we can be if circumstances change dramatically and indeed if we do something with lasting repercussions on ourselves and our social or physical environment. Indeed the growth of the neural network follows no mathematical rules, it is non-linear. For this reason many research programmes are using this model to design intelligent computers, analytical systems or model the evolution of language.

But where exactly is the archaeological application? I think first of Vermeer's Delft bourgeoisie, surrounded from birth with certain modes of behaviour, but with also freedoms of action, all visually and tactually tied with a walled town, houses and furnishings, dress codes, licit and illicit behaviours, distinctive for their age and region and even in some respects to particular towns. I then think more practically to my own research work on postmedieval deserted villages in Greece, where our careful study of broken cookware, or tableware, and house styles can be given a specific lifeway scenario. Whilst in our region of Eastern Greece the postmedieval peasant around 1800 AD lives with his animals under one roof (fig. 6), with

limited possessions and sharing a low table and a single dish with an extended family, and speaking a form of Albanian from a colonization centuries earlier, in Western Greece (fig. 7) at the same period, this icon of a biblical scene actually shows us the lifestyle of the 18th century Ionian Islands – a more cosmopolitan society widely connected by trade and culture to capitalist Italy, at ease with Greek and Italian, sitting upright at a table with individual table settings, with wine glasses and imported majolica tableware, and neoclassical furnishings. The origin of this divergence

between these two cultural regions of Greece we can date archaeologically to the 17th century AD.

The way things are done, how we eat and talk, whom we mix with, the objects around us and in our hands, our horizons, all these are etched into the architecture of the neural networks and deeply talk back to us at every new scene in our lives.

As archaeologists we have long been able to work with the sherds and house foundations, now I believe we can begin to enter the minds.

Literature

Anonymous 1991	Anonymous, An Interview with Richard Gregory. Cogito 1991 (Autumn), 123–129.
Barrett 1994	J. Barrett, Fragments from Antiquity. Oxford: Blackwell 1994.
Bintliff 1991	J. L. Bintliff (ed.), The Annales School and Archaeology. Leicester: Leicester University Press 1991.
Bintliff 1997	J. L. Bintliff, Catastrophe, Chaos and Complexity: the Death, Decay and Rebirth of Towns from Antiquity to Today. Journal of European Archaeology 5, 1997, 67–90.
Bintliff 1999	J. L. Bintliff (ed.), Structure and Contingency in the Evolution of Life, Human Evolution and Human History. With a Foreword by S. J. Gould. London: Cassell 1999.
Bintliff 2003	J. L. Bintliff, Searching for Structure in the Past – or Was it »One Damn Thing after Another«? In: R. A. Bentley/H. D. G. Maschner (eds.), Complex Systems and Archaeology. Salt Lake City: University of Utah Press 2003, 79–83.
Bintliff 2004	J. L. Bintliff, Time, Structure, and Agency: the Annales, Emergent Complexity, and Archaeology. In: J. L. Bintliff (ed.), The Blackwell Companion to Archaeology. Oxford: Blackwell 2004, 174–194.
Carter 1998	R. Carter, Mapping the Mind. London: Weidenfeld and Nicolson 1998.
Layton 2001	R. H. Layton, Intersubjectivity and Understanding Rock Art. In: P. F. Biehl/F. Bertemes/H. Meller (eds.), The Archaeology of Cult and Religion. Budapest: Archaeolingua 2001, 27–36.
Netta 2001	I. Netta, Vermeer's World. Munich: Prestel 2001.
Nicassio 1991	S. V. Nicassio, A Tale of Three Cities? Perceptions of Eighteenth-Century Modena. Journal of Interdisciplinary History 21(3), 1991, 415–445.
Shennan 2002	S. Shennan, Genes, Memes and Human History. London: Thames and Hudson 2002.