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*Present, Past And Future*

Essays in Honour of Evžen Neustupný

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and Jan Turek



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**PART I**

**CONTEMPORARY DISCOURSES  
IN ARCHAEOLOGICAL THEORY**

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## 2. *SCIENTIA*, SOCIETY, AND POLYDACTYL KNOWLEDGE: ARCHAEOLOGY AS A CREATIVE SCIENCE

*Timothy Darvill*

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The epistemic basis of knowledge creation has long been a subject of interest in archaeology and one that Evžen Neustupný has contributed to through his award-winning essay *Whither archaeology?* and his book *Archaeological Method* with their central concern for theory, methods and the validation of knowledge. Tensions between the epistemologies of east and west, and between sciences and the humanities, have been well to the fore in much of this, and remain at the core of many wider debates within archaeology. But there is a bigger picture, and one that also has importance in theoretical, practical, and professional terms. Taking one step back from the epistemology of knowledge creation, this paper considers a broader ontology of knowledge, providing an excursion into the metaphysical nature of archaeological knowledge, its constitution, and its application in contemporary society. It is suggested that archaeology is essentially a creative science, and that on an international compass embraces many different but connected kinds of knowledge. Like the fingers on a hand, the separate digits of polydactyl knowledge are of equal value and interest albeit prioritized in different ways by different societies and subcultures.

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### **Introduction**

Following the publication in *Antiquity* of a high-profile and controversial article by Jacquetta Hawkes about the nature and purpose of archaeological endeavour (Hawkes 1968), the journal's editor Glyn Daniel challenged younger archaeologists to say where they thought archaeology was going and where it should go (Daniel 1969, 6–7). The competition was entitled 'Wither archaeology?' The prize for the best essay was set at £50; contributors had to be under 40 years of age; and the closing date was 1 June 1969. Two winners were declared: Glynn Isaac from the University of California, Berkeley, in the USA, and Evžen Neustupný based at the Archaeological Institute in Prague within what was then Czechoslovakia (see Isaac 1971 and Neustupný 1971 for the winning essays). The debate stimulated by these papers continued in *Antiquity* (Watson 1972; Hogarth 1972; Clarke 1973) and beyond

(e.g. Tuggle *et al.* 1972; Renfrew 1973), but at the heart of many contributions was a struggle to come to terms with the long-standing tension between positivist and relativist philosophies in archaeological thinking.

Neustupný recognized this tension in his prize-winning essay while also highlighting differences in contemporary approaches adopted in eastern and western Europe. He helpfully suggested that there were:

three main factors determining the evolution of archaeological thought: the number and quality of the record, the general position of the methodology of science and anthropological theory, and the prevalent ideology.

(1971, 34–5)

Such ideas were developed further some two decades later in his book *Archaeological Method* which starts with the memorable line that “No progress in archaeology can be achieved by simply accumulating finds” (Neustupný 1993, ix). But the focus of the book – implicit in its title – and much of the ongoing debate over the past 40 years revolves around reconciling methods and practices based on the notion that there is a ‘right’ way to do archaeology and that somehow its aims can be unified (cf. Barrett 1995). By implication, there would be an agreed epistemology based on established methods and procedures for the validation of preferred understandings and interpretations. Such a position stands in sharp contrast to the multivocal strains of much post-processual archaeology where critique focused especially on ideology and to a lesser extent on theory and field practice (Hodder 1992).

Such epistemic considerations are important, but they only provide part of the picture. In this paper I would like to take one step back from procedures associated with the production of knowledge in archaeology, to ask what kind of knowledge are we trying to make? What might it look like? And who might use it? In trying to answer such things we are at once in a different debate, one which foregrounds the broader ontology of archaeology and provides an excursion into the metaphysical nature of knowledge, its constitution, its diversity, and its application and relevance within contemporary society. In short, thinking about the content and application of archaeological knowledge means looking at the very nature of its being, or more realistically the never-ending process of its becoming. Starting therefore with a brief consideration of relevant philosophical approaches to understanding the dimensions of knowledge it is suggested that archaeology is essentially a creative science or *scientia* and that on an international compass it embraces several different but connected spheres of knowledge. All are provisional in the sense that such knowledges are always subject to amendment and expansion, and socially contingent in the sense that understandings are only meaningful under existing or specified conditions. Four such strands of archaeological knowledge are explored in detail – narrative knowledge; strategic knowledge; indigenous knowledge; and contemplative knowledge – and linked to social demands for archaeology generally. Like the fingers on a hand, the separate digits of this ‘polydactyl’ knowledge can work independently or together. For archaeology the recognition of polydactyl knowledge provides a realistic and relevant basis for thinking about the place of the discipline in the modern world and recognizes that different kinds of knowledge are of equal value and interest albeit perceived, developed, and transmitted in different ways by different societies and subcultures.

## Dimensions of knowledge

Since ancient times, philosophers have grappled with definitions of what knowledge is. On the one hand they have to separate common-sense and the obvious from abstract systems of knowledge; on the other they have emphasized differences between knowledge, truth, belief, justification, and certainty. Epistemology, the theory of knowledge, remains a key strand of contemporary philosophy, but its approaches are far from unified (Audi 2003). Gordon Childe was probably the first archaeologist to jump into the centre of the debate with a philosophical text entitled *Society and Knowledge* in which he explored the domain from the perspective of a prehistorian (Childe 1956). His view, overtly Marxist in its conception, was that knowledge should be public, communicable, and useful to society. For him, knowledge was “an ideal reproduction of the external world serviceable for co-operative action thereon” (Childe 1956, 54). More recently, John Barrett, Ian Hodder, Mike Shanks, Chris Tilley and others have pursued strongly relativist perspectives, arguing that the aim of archaeology should be the development of self-knowledge, a knowledge of the present, something that becomes an agent of social action and a means of control and social change (Barrett 1995; Hodder 1984; 1999; Hodder *et al.* 1995; Shanks and Tilley 1987, 196–7).

Looking behind these ideas there seems to be a poverty of simple and straightforward analysis of the stuff we call knowledge. But there are some generally agreed characteristics (Audi 2003, 220–55). Knowledge arises in *experience*. It emerges from *reflection*. It develops through *inference*. And it exhibits a distinctive structure based upon *perception* which looks outwards, *memory* that looks backwards, *introspection* that looks inwards, and *reason* that looks beyond direct experiences of the world in space and time. It is also widely accepted that knowledge is socially constructed, a point well demonstrated by Latour and Woolgar’s anthropological visits to science laboratories (1979) that could no doubt be replicated by similar visits to archaeological excavations and surveys almost anywhere in the world. As Michel Foucault pointed out back in the 1960s, humanity has not inherited domains that are already outlined and have to be filled in; rather it is our task to define and elaborate the intellectual landscape within which we wish to work (Foucault 1970, 344). This is good news for modern archaeology because it allows the possibility of recognizing and working with more than one kind of knowledge, of reconciling tensions within the discipline arising from servicing fundamentally different knowledge structures, and perhaps even of charting our own territory by defining kinds of knowledge appropriate to the unique perspectives that archaeology offers.

In tracing the emergence of archaeological thinking through the seventeenth, eighteenth and nineteenth centuries, Julian Thomas emphasizes the use of binary categorical separations – Cartesian dualisms – of such things as mind and body, nature and culture, and physical and spiritual (Thomas 2004). Under such conditions a kind of positivistic/scientific knowledge was formulated within what is now termed a foundationalist view. This calls for the creation of an epistemic chain linking direct knowledge – justified empirically derived sensory experience – as a foundation for various forms of indirect knowledge. Such frameworks underpin much traditional archaeological thinking either through building

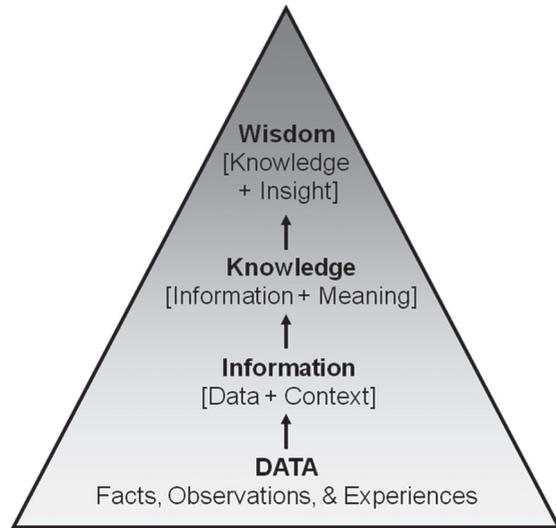


Fig. 2.1. Knowledge hierarchy (after Davenport and Prusak 1998 and Mount 2004, fig. 29.2).

arguments based on material observed or collected in the field, or by regressing generalities back to some foundational core.

Following Davenport and Pursak's (1998) lead, Charles Mount has usefully summarized this foundationalist view of knowledge creation in archaeology in terms of a hierarchy that progresses from raw data at the bottom through to a vision of wisdom at the top (Mount 2004, 244) which can usefully be represented as a pyramid (Fig. 2.1). Much of the everyday activity of archaeology involves gathering data and its contextualization to provide information (and see Chippindale 2000). Concerns that increases in the number and scale and archaeological excavations have destabilized such a structure by generating vast amounts of data without turning it into information or knowledge have been bubbling up for some time (*e.g.* Thompson 1975; Jarrett and Thompson 1975; Thomas 1991) and the challenge now is to turn this data and information into socially meaningful products (Darvill and Russell 2002, 66; Bradley 2006; Phillips and Bradley 2004; Cooney *et al.* 2006).

Under the conditions of post-modernity, or counter-modern as Thomas prefers (2004, 42), knowledge can be formulated in other ways. Amongst them is the coherentist or naturalistic view that is predominantly relativist in perspective. In this, arguments need not be linear, or lie in a grounded chain. Rather they fit, in a holistic way, into a coherent pattern of interlocking strands like the warp and weft of a cloth or carpet. Justification emerges because things fit the pattern in an appropriate way. Coherentist views are increasingly used in archaeology, especially for the construction of grand narratives. Looking for patterns across time and space represents a good way of exploring and presenting our materials and provides another outlet for the accumulating mountain of data and capta.

Neither foundationalist nor coherentist views say anything about the content of knowledge and its uses, only how justificatory arguments are assembled and structured to give meaning and coherence. Moreover, the prioritization of one view over another has tended to divide one discipline from another and fractionate research efforts even

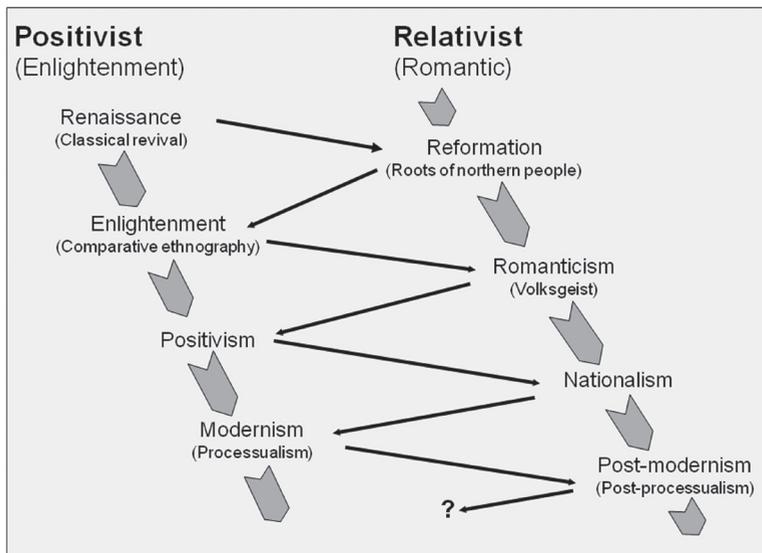


Fig. 2.2. Andrew Sherratt's European dialectic model (based on Sherratt 1996, fig. 1).

within single disciplines. The 'Two Cultures' epitomized by C. P. Snow in his 1959 Rede Lecture in which the sciences stand separated from the humanities has been a leitmotif of academic endeavour for more than a century (Snow 1962), bolstered and sustained by tensions already alluded to between positivist and relativist approaches to the production and validation of knowledge. It is a debate that has cascaded down into archaeology and in retrospect seems to have been played out over the last 500 years through what Andrew Sherratt (1996, 142) usefully characterized as the 'European Cultural Dialectic' (Fig. 2.2). This identifies two broadly parallel trajectories of thought, each using ideas taken from a range of other disciplines including philosophy, art history, and literature. Such borrowings are not always strictly in sync with the application of ideas elsewhere.

The first trajectory in Sherratt's model is predominantly 'enlightenment' in its approach, providing essentially evolutionary narratives in which order, hierarchy, and progression are paramount. Models of change are deterministic, and analysis is largely comparative. This set of attitudes can be traced from the classical revivals of the Renaissance in fourteenth century Europe, through the Age of Enlightenment in the seventeenth and eighteenth centuries, to positivist science from the early nineteenth century, and, most recently, modernist and processualist views current from the mid-twentieth century.

The second trajectory is predominantly 'romantic' in its vision, with genealogical narratives focusing on meaning, action, growth, and descent. It is grounded in contextualist and relativist modes of thinking to produce accounts of the past that are largely interpretative. This line of approach comes into sharp view during the Reformation in Europe in the early sixteenth century, but its concern for the roots of northern peoples and the local origin of archaeological remains can be glimpsed amongst the mythical histories of medieval times. Later periods

favouring such approaches include the Romanticism of the eighteenth century, Nationalism in the late nineteenth and early twentieth centuries, and, currently, post-modernism and its counterpart in post-processual archaeology from the late 1980s onwards.

While each of these trajectories unfolds in parallel, the dialectical element of Sherratt's model emphasizes the periodic shift in dominance between the two trajectories. Phases of popularity, stability, and contentment with one line of thinking leads to disenchantment, challenge, and revolt, and consequently a shift back to the other approach. At any one time there is a favoured, rather visible, dominant tradition on one trajectory, while research on the parallel line takes on a reduced significance until the next shift in emphasis rekindles attention. The picture is rather akin to what Kuhn (1970) has elsewhere modelled as 'paradigm shifts', and what Sterud (1973) called a 'paradigmatic view'.

If we follow Sherratt's model then reactions to the hyper-relativism of post-processual 'romanticist' archaeology should now be promoting a drift back towards more 'enlightenment' views. Certainly there are signs that this is happening, and in large measure it is being driven by the practical side of archaeological endeavour represented within the archaeological process (Hodder 1999, 20–9). But archaeology is also being swept up by a bigger groundswell of intellectual change in which the very foundations of the binary divide between the 'Two Cultures' are starting to crumble. Despite the fact that in the UK at least there are institutionalized and bureaucratic attempts to reinforce traditional divisions based on materialist ideologies (Sheldrake 2012, 6–12), the overarching principle at the level of those engaged in research is that curiosity no longer knows any bounds and that there is a shared love of discovery and capacity for wonder (Willis 2012). Following a suggestion by Philip Esler (2005, 11), the term *scientia* – the simple common Latin word for 'a knowing' or 'knowledge of' – suitably captures a sense of knowledge that is built through studies that transcend traditional divisions between the humanities and the sciences and may usefully be applied to the outputs or products of archaeological endeavour.

### **Knowledge/*Scientia*: the product of archaeology?**

Focusing on the products that archaeology makes rather than the processes used provides a novel perspective. Certainly the sources of data and information that contribute to archaeological knowledge-building are diverse. Within the discipline it is easy to identify sources such as surveys, excavations, remote sensing, materials analysis, environmental reconstruction, and so on, while beyond archaeology contributions can be recognized from anthropology, geography, history, sociology, physics, chemistry, biology, and many other subjects beside. There is an implicit expectation all these contributions will somehow come together, perhaps filtered through particular theoretical and ideological perspectives as previously noted, to somehow align themselves and become archaeological knowledge. Over the past five decades archaeology has also become more politically aware (Layton 1989; Gathercole and Lowenthal 1990; Fowler 1992; Kristiansen 1993; Jensen and Karlsson 2000) with the result that what the discipline produces is necessarily provisional, changing, socially defined, negotiable; something that is perhaps best seen as a rather vague 'knowing'

of the past itself and more especially the past in the present. There remains an assumption, however, that archaeological knowledge is an essentially holistic phenomenon, a singularity, that somehow all the pieces of the great jigsaw depicting the past will be found and tapped into place. Is such a vision still tenable?

Unsurprisingly perhaps, various attempts have been made to deconstruct, characterize, define, and categorize such singular bodies of knowledge that any given society may hold, especially contemporary western Christian societies. Three are picked out for attention here because of their implications for understanding the nature and form of archaeological knowledge. Importantly, all recognize one thing: knowledge is not singular. Knowledge is a multi-faceted creation, a set of inter-digitated knowledges: *scientia* embraces multiple sources and has a plural complexion that it not so much about reducing reality to its essentials but rather expanding reality to reveal its limits, complexity and diversity. As Rupert Sheldrake (2012, 342) recently suggested, “the realization that the sciences do not know the fundamental answers leads to humility rather than arrogance, and openness rather than dogmatism”.

Foucault (1970, 344–8) suggests that by the later twentieth century humankind had established three faces to knowledge. These he graphically visualized as a volume of space open in three dimensions. In the first he situated knowledge based on deductive linear thinking that links evidence together, or empirically verifies propositions, such as characterize work in the mathematical or physical sciences. In the second face he saw knowledge based on the relationships between a series of discontinuous but essentially analogues elements that are examined in ways that allow causal links and structural constants to be identified; the kind of work that might be seen in biology or linguistics or economics. And in the third face there was reflective knowledge based on philosophical positions of sameness and analogy involving the formalization of thought.

Precariously balanced across the planes of this epistemological trihedron, excluded from the three faces yet visible through all of them, were the human sciences and the rather peculiar kind of knowledge that surrounds our view of the human condition and human relationships with each other and the wider world. For archaeology it is plain to see existing practices situated within all these faces of knowledge: our empirical investigations in the first face, our inquiries into questions about social change in the second, studies of processes, social action and agency in the third, and our reflective musing on the human condition in past times balanced across the trihedron. In Foucault’s thinking all are part of the same body of knowledge, all are equally relevant to society, and even though each is grounded in a particular epistemological structure none should be privileged over another. Only when interdigitated together can they be considered as a body of knowledge.

A slightly different view is advocated by Cook and Brown (1999) who draw on organizational theory to look at knowledge in relation to groups and individuals. They define two primary forms of knowledge: explicit knowledge as something conscious that can be expressed, codified, stored and shared across time and space in signs, words, or numbers; and tacit knowledge as something sub-conscious, personal, and context specific that is learned through experience but which cannot easily be shared or communicated. Both forms of knowledge may be held by individuals as concepts and skills respectively, or

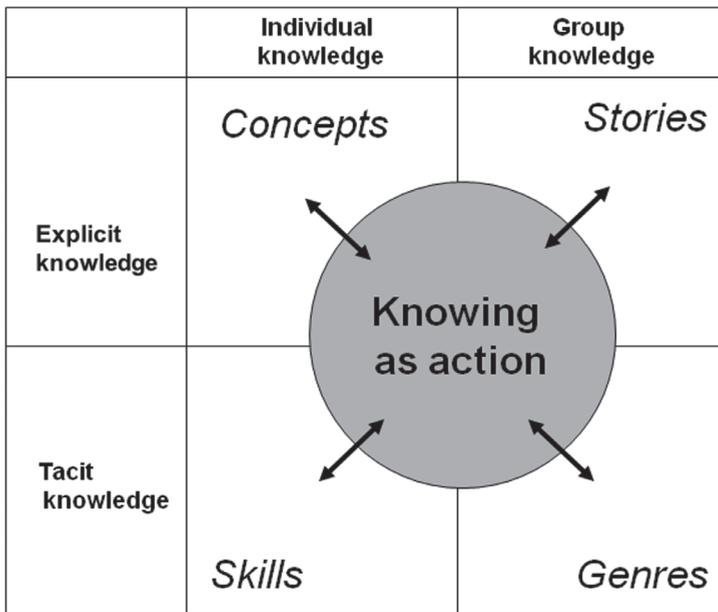


Fig. 2.3. *Knowing as action in relation to four forms of knowledge (after Cook and Brown 1999 and Mount 2004, fig. 29.1).*

shared within groups as what might be called stories and genres (Fig. 2.3). Informal social networks with a shared or overlapping repertoire of concepts, stories, skills and genres may be referred to as a “community of practice” (Wenger 1997), a phenomenon easily recognizable within modern archaeology at least in the Anglo-American world (Mount 2004, 243). Purposeful activity by the community involves bridging all four forms of knowledge as conceived by Foucault through reciprocal interplay. Here, however, the power and impact of their actions is in part at least determined by the values placed upon each form of knowledge by society at large (see Lipe 1984; McGimsey 1984; Schaafsma 1989; Darvill 1994; 1995; Carver 1996; Carman *et al.* 1999; and Coningham *et al.* 2006 for relevant discussions of value in archaeological work).

A third approach is presented by the American philosopher Robert Audi (2003). He defines three interconnected domains of knowledge that typically guide our lives: scientific, moral, and religious.

Scientific knowledge in Audi’s analysis is grounded in perceptual experience, whether in the laboratory or in the field. Knowledge emerges as one makes observations; inductively generalizes from them; and, through the inductive transmission of knowledge from one’s premises to one’s conclusions, comes to know the truth of a generalization. Axiomatic here is the notion that scientific knowledge does not automatically arise as we observe our surroundings, but as Barnes and colleagues point out “at the basis of knowledge there lies a causal relationship between the knower and reality” (1996, 1). To achieve such a

relationship there must normally be some questions or propositions about the world, as these direct our inquiries. The justification of proposals or hypotheses often needs deductive reasoning in order to create tests of some kind. As a result, some hypotheses are rejected, some are confirmed, and some that are confirmed become known. We discover a great deal by seeking explanations and positing hypotheses to explain puzzling data and this commonly constitutes knowledge too. Indeed, for archaeology this dimension of ‘discovery’ is probably one of the largest contributors to what we know.

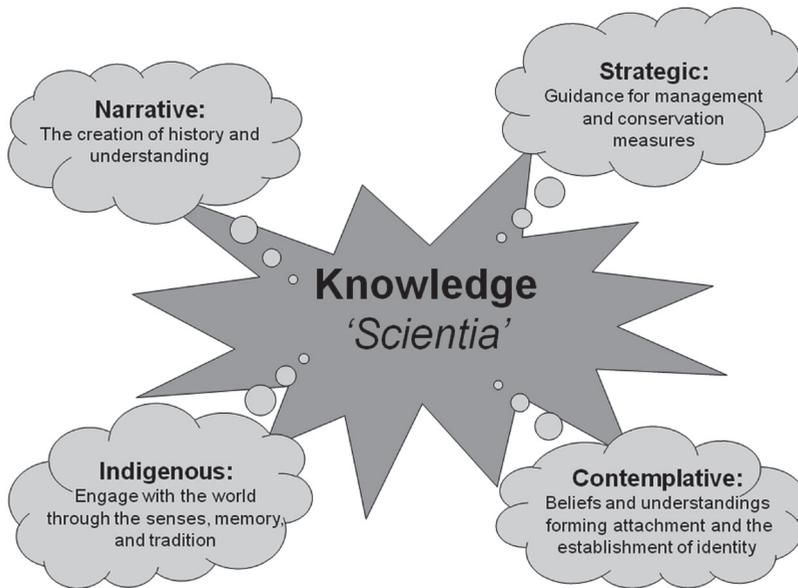
Moral knowledge by contrast arises from quite different questions. Under the conditions of modernity there was an inclination to see moral judgments as, at best, culturally conditioned assertions. Things have changed, and many now consider that moral judgments are justifiably true relative to a particular culture or subculture. In general, moral knowledge is not perceptual, rather it is grounded in reflection, memory, and cultural rationality, and for this reason remains contentious.

Different again is Audi’s third domain: religious knowledge. The traditional negative view is that religious propositions are simply beyond the scope of human knowledge because they cannot be known *a priori* or on the basis of experience. However, the application of coherentist approaches opens a range of possibilities that take us beyond the futile debates about, for example, the existence or otherwise of a ‘god’. As noted, coherentist or naturalistic approaches seek patterns that Audi argues can be justified on the basis of experiences just as easily as on the basis of evidence. Here he is expanding the ontological framework not only to include more broadly constituted forms of knowledge, but also to take into account a revised justificatory basis that accommodates certain kinds of acceptance, presumption, and faith. Again this is potentially important for archaeology because the broad category of religious knowledge is not restricted to the great established religions and faiths of the world. There are fields here that relate directly to human actions past and present.

None of these three treatments of knowledge is unproblematic, and many of the categories proposed require some strengthening of their epistemological configuration. Ontologically, all emphasize the role of creativity in forming knowledge, its dynamic and recursive form, and the interconnectivity of different spheres of knowledge that, like the fingers on a hand, can work independently or collectively to help shape and reshape the unfolding trajectory of social change.

### **Creativity and polydactyl knowledge in archaeology**

Archaeological knowledge does not simply make itself out of data and information even with the addition of meaning imparted through understandings of context, ideology, and theoretical perspectives. As Coudart has emphasized (2006, 133) “scientific theory is about creating a representation of the ‘essence’ of the reality, rather than the reality itself”. For archaeology this can only be achieved with some kind of creativity – inventiveness and imagination – and in this sense archaeology can be seen as a ‘creative science’. Quoting words from Alberta University’s Centennial Centre for Interdisciplinary Science, Martin Willis (2012, 13) notes that “art, like science, shares a deeply rooted bond in an emotional,



*Fig. 2.4. Representation of four interconnected strands of knowledge/scientia discussed in this paper.*

if not spiritual, sense of awe, and artists, like scientists, often begin their work from careful observation”. Creativity involves the enterprise of imagination which begins with wonder, awe, and curiosity before being managed into action and discovery. Both deductive and inductive ways of working on problems are relevant and may be used in parallel, in series, or in tandem. Colin Renfrew (2003) has discussed the parallel visions shared by artists and archaeologists in puzzling things out, while Chris Tilley (1989, 280) suggests that “excavation has a unique role to play as a theatre where people may be able to produce their own pasts ... a socially engaged rather than scientifically detached practice”. As such, the mantra of archaeology as a creative science is simply: be curious! Archaeology is all about using the imagination. Curiosity-driven research is arguably the most powerful of the various research modes in common usage (Black and Jolly 2003, 36–9; Binford 2001; Darvill 2007, 4–5), while the archaeological imagination is the sharpest blade in our toolbox. As Martin Carver once suggested, we are digging for ideas (1989).

Creativity spawns diversity and a proliferation of outputs or product, something wholly consistent with the recognition of multiple knowledges. Following the metaphor already triggered: the accumulating body of archaeological knowledge has many fingers so may be referred to as polydactyl knowledge. Here Foucault’s analysis liberates our attachment to any one particular structure of knowledge, and emphasizes the freedom we have to develop a series of parallel stands, of which four stand out for comment here (Fig. 2.4).

### *Narrative knowledge*

Narrative knowledge or ‘formal knowledge’ is what archaeologists in the western world are best known for: big pictures of how life was in the past created from the meager fragments that survive in the present. It is a kind of discursive scientific knowledge that is not exactly history, nor anthropology, nor heritage: it is increasingly recognized as a valuable account of the past in its own right that may contribute to these other disciplines just as they contribute to archaeology. Archaeology is archaeology and brings a unique time-space perspective to the past with observational justifications based ultimately on the field-study of *in situ* remains even if aspects of the work involve the examination of *ex situ* materials in the laboratory, archive, or museum.

As already seen, the epistemology of narrative knowledge in antiquarian and archaeological studies over the past 500 years has oscillated between positivist and relativist modes of thinking (Sherratt 1996), although how these positions emerged has for long been rather unclear. However, recent research, is finding evidence that the scientific revolution in Europe in the seventeenth century had deeper roots than once thought with increasing consensus that acknowledges the medieval foundation of early modern science and a fundamental debt to thinking in the Islamic world before AD 1200 (Beckwith 2012). Central here is what Beckwith (2012) calls the ‘recursive argument method’ (RAM) which is characterized by the recursive pattern of argument, sub-argument, sub-sub-argument and so on. It is an interesting pattern that as it developed gave rise to asymmetries. Grossly simplified, the conventional RAM was complemented by a scheme that involved question, response to question, and objections to the responses, a scheme of thinking that might have prompted the foundation of the Enlightenment ‘scientific method’ based on question, hypothesis, test, acceptance/rejection/modification of the original hypothesis (Gribbin 2005, 275–318). Indeed, it would be deliciously ironic if an intellectual tradition that subdivided to separately privilege the thinking of artists and scientists for more than eight centuries was finally reuniting under the collective banner of *scientia*.

Notwithstanding, traditional propositional or foundational knowledge of the kind embraced by narrative knowledge is credited with a high degree of certainty even though it can only be certain in the sense that it is a true belief based in the right way on the right kind of ground. This is not necessarily so, and it is better to view certainty as a gradient rather than an absolute (Audi 2003, 262–5). Coherentist or naturalistic approaches also have much to offer and are based on acquaintance rather than description, emphasizing either causal relationships or reliance on the archaeological process, theoretical perspective, or ideological stance as a means for justification. Either way, we increasingly have to accept that narrative knowledge is approximate knowledge – a well-grounded belief that holds true up to a certain level. And it also has to be accepted that such knowledge is not ‘value free’: ideology provides a link between scientific questions and political objectives but most ideologies are more concerned with how individuals should behave rather than how they do behave (Lull *et al.* 2012, 276). Ostensibly at least, narrative knowledge is about the past, but as American singer Bruce Springsteen is quoted as saying, “The past is never the past. It is always present” (Hagen 2009), a statement echoing George Orwell’s famous

proposition that “Who controls the past controls the future, who controls the present controls the past” (1949, 213) and raising the question of what archaeological knowledge in the context of the present might look like.

### *Strategic knowledge*

Strategic knowledge, also sometimes called milieu knowledge, is a relatively new and important field for archaeologists to be working in. It is all about the past in the present, providing perspectives and opinions that inform social policy (foresight), the application of legislation, decision-making at all levels, and cultural resource management. It represents the knowledge-set most relevant to the sector of the discipline in which most archaeologists now find themselves working.

At a general level there is much to contribute to debates such as those concerning global warming, climate change, resource sustainability, identity, and globalization, although rarely are archaeologists seen pitching-in with the case-studies and material that they have to hand (but see Fagan 2004; Mitchell 2008). Locally, archaeology can and should make a contribution to debates about where roads, factories, houses, and all kinds of other facilities and infrastructure should be built, what form it should take, and which bits of the past should be destroyed and which retained. Robust approaches to site appraisal, desk-based assessment, field evaluation, predictive modelling, and the formulation of mitigation strategies have been developed in the field of Archaeological Resource Management and a significant body of strategic knowledge is building up (*e.g.* Ove Arup 1991; Darvill and Gerrard 1994; Van Leusen and Kamermans 2005). In the case of Stonehenge in Wiltshire, UK, the accumulation of strategic knowledge in relation to the relocation of the visitor centre, closure of the A344 road beside the iconic monument, and the up-grading of the main A303 road that runs across the middle of the World Heritage Site threatens to dwarf the narrative knowledge about the great stone monument itself (Darvill 2005, 11–14; 2006, 276–80 with earlier references).

Archaeology has become an environmental quality issue with the gradual alignment of archaeological interests with the environmental lobby and the green movement (Macinnes and Wickham Jones 1992). There has also been success in integrating archaeological matters with spatial planning systems at local and regional level and through Environmental Impact Assessment (Thomas and Ralston 1993; Wainwright 1993). Archaeology in its broadest sense has also become an environmental design issue, with links now being forged with tourism, leisure, and the entertainment industries that in the western world are fast becoming key drivers of economic growth (Leask and Fyall 2006).

Archaeology is also becoming a quality of life issue. One key development was the concept of the ‘Therapeutic Landscape’, developed by Wil Gesler in the early 1990s as a framework for the analysis of natural, built, social, and symbolic environments that can contribute to healing and well-being (Gesler 1993; Williams 2007). A UK policy discussion document, *Better Places to Live* (DCMS 2005) sets out a case for strengthening the relationship between communities and the built environment as a way to better understand identity saying that “all of these historic places still form part of peoples’ lives ... we should do more to make this connection between people and places” (DCMS 2005, 13–14).

Another field for the development and deployment of strategic knowledge is by using understandings of the past (narrative knowledge) to create better understandings of the present and projections for the future. Such an approach is fostered by what historical geographers have called ‘recentism’ (Jones 2004), although in an anthropological or ethnoarchaeological context such ancient–modern comparisons might be better seen as a particular application of formal analogies (cf. Hodder 1982, 11–27). Much is made of this in what might be termed popular science, as for example in Jared Diamond’s book *Collapse* (2004), but rather few conversations have been developed between archaeologists and other contemporary sciences (cf. Lauwerier and Plug 2004; Smith *et al.* 2012). Two exceptions may however be noted. The first is urbanism, where for example Michael Smith (2010) has used insights from ancient cities studied archaeologically to generate insights into issues of urban sprawl, squatter-settlement, and urban sustainability. The second is in relation to the management of cultural landscapes (cf. Darvill and Gojda 2001). Here the concept of sustainability has long been taken as a guiding principle but its application can now be expanded by the notion of long-term “social-ecological resilience” (Plieninger and Bieling 2012).

### *Indigenous knowledge*

Indigenous knowledge involves an understanding of a past that is brought into the present from some earlier tradition, or from one culture into another, and is sometimes known as tacit knowledge or informal knowledge. It is, in a very real sense, part of a past-present continuum communicated and transmitted by memory, folklore, and many aspects of intangible heritage such as oral tradition, song, and dance. All contribute to indigenous knowledge whether or not there are surviving aboriginal populations. Barth (2002) considers how ‘tradition-specific’ knowledge is assembled as particular relationships between a substantive corpus of assertions, a range of media representations, and the social organization of the community itself. This, he argues, is not a diffuse relativism in which anything goes, but rather a way in which individual human experiences of the world generate culturally diverse meanings and world-views. Thus in looking at North American indigenous communities Cajete (2000, 2) notes that native science is a metaphor for a wide range of tribal processes of perceiving, thinking, acting, and ‘coming to know’ that have evolved through human experiences of the natural world in such a way that native science is born of a lived and storied participation with the natural landscape.

Indigenous knowledge, in some ways perhaps a kind moral knowledge in Audi’s scheme discussed above, remains poorly explored territory in archaeology, although it is an area that we are waking-up to fast (Cleere 2006; Whitley 2007). Already there are international conventions and agreements safeguarding human rights, protecting common heritage, and perpetuating all manner of culturally-specific moral and ethical judgments. Two recent examples give a flavour. The Council of Europe’s *Framework Convention on the Value of Cultural Heritage for Society*, aims to recognize individual and collective responsibility towards cultural heritage (CoE 2005). It asks parties to the convention to take necessary steps to apply the provisions of the convention for the construction of a peaceful and democratic society supportive of sustainable development and the promotion of cultural

diversity. And in a similar vein, UNESCO is promoting its *Convention on the protection of the diversity of cultural contents and artistic expressions* approved in 2005. This includes amongst its objectives the desire to “give recognition to the distinctive nature of cultural goods and services as vehicles of identity, values and meaning” and to “provide a framework within which cultures may freely evolve and interact” (UNESCO 2005, Art. 1).

Importantly, although indigenous knowledge is mainly associated with the ‘here and now’ (= present), axiomatic to the archaeological project is the notion that must also be a ‘there and then’ (= past) within which indigenous knowledge would have provided the fundamental underpinnings. As such, past indigenous knowledge must be seen as a non-discursive knowledge set with embodied world-views, unconscious habits, doxa, and daily practices involving codified and emblematic traditions that provided the key means of communication and transmission. As Alberti and Bray point out (2009, 337), indigenous concepts of animating essences and cross-cutting natural ‘life-forces’ were once at the centre of ethnographic research, but through the later twentieth century they were branded as mystical, primitive, and ‘unscientific’. The same could also be said of archaeological research, but even more difficult to accept in recent decades has been the fourth and final strand of knowledge to briefly explore here. This involves what western positivist science would classify as unsubstantiated belief.

### *Contemplative knowledge*

Contemplative knowledge is perhaps the most alien of these four strands for archaeologists to grasp as it mainly relates to personal insights, beliefs, emotions, and understandings that provide the basis for attachments to a particular place, time, or event, while often contributing to a sense of identity and a place in the world. Connecting to sites and items that clearly provide a direct attachment to the past is important in the creation of contemplative knowledge. The 20,000 or so people that regularly turn up at Stonehenge for the summer solstice are not there to receive narrative knowledge about the stones and their landscape (however much we might feel moved to tell them about it). Rather, they are seeking, in all sorts of ways, religious experiences which, however flimsy they might seem, must surely be the basis for establishing some kind of contemplative knowledge. Contributing to such knowledge, and engaging with the construction of this kind of knowledge, provides a challenge for the future and great scope for bringing something new and innovative to the field of archaeological theory.

### **Conclusion**

Archaeology is an international discipline with a long history and compelling links to sites and landscapes that collectively tell the unique story of human existence over several million years. Much effort has been devoted to establishing fruitful methods and agreed practices, to recognizing the ideological influences on interpretative models, and to developing acceptable epistemologies in order to validate interpretations and understandings. Here attention

has focused on how archaeological data and information can be used at higher levels of abstraction by combining information and meaning to create knowledge. Accepting that knowledge building is a creative process, and that archaeology draws on a wide spectrum of sources across the arts, humanities, and sciences to establish a polydactyl knowledge or *scientia*, then the pursuit of knowledge and the search for meaning and reality takes the discipline and its practitioners to the edge of what is humanly knowable. Curiosity knows no bounds and our task is to develop knowledge premised on the basis of reasoned objectives, neutral observation, and evidence-gathering. Knowledge-making should be policy-relevant, fit for current challenges, solution-driven, and of course stimulating and interesting in its own terms. Recognizing the existence of polydactyl (plural) knowledge in archaeology parallels ways of thinking in other academic arenas, for example in technological analysis and management studies (Fleck and Tierney 1991; Fleck 2007). It allows archaeology's community of practice to enrich everyone's quality of life and increase the value of investment in the subject by providing and promoting different kinds of knowledge that support a range of different social needs.

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