LEWIS ROBERTS BINFORD

Lewis Roberts Binford
1931–2011

Lewis Binford was the most influential archaeologist of the last century. The subject that he entered as a brash young graduate student in the late 1950s bore little relation to the one he left on his death in 2011. This transformation can in large measure be attributed to his passion and pursuit of the remote past. He insisted that archaeologists must change both their questions and the conceptual frameworks they had employed for more than a hundred years. He debated fiercely with traditionalists and any backsliders from the type of archaeology in which he so fervently believed. Abrasive, bearded and bear-like, to be at a Lew Binford lecture was to be in the presence of an ancient prophet and law giver. Outside archaeology he is hardly known. He never dug up anything that grabbed headlines. He never became a public face for archaeology. He never headed an institution or ran a department.

To make change happen in archaeology he focused on the marginal. His main interest was in our earliest origins, the Palaeolithic period, which was more geology than archaeology when he began his career. He devoted his energy to understanding how modern peoples who live by hunting and gathering solve the challenges of survival. He then found ways to transpose those lessons to the study of the past. However, it was from this peripheral position on the edge of archaeology and the corners of contemporary society that he challenged, and then changed, the way archaeologists of all periods and places approached and understood their evidence.

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The sceptical graduate student

Binford described his own intellectual and personal journey on several occasions.[1] The accounts make for an entertaining and informative read about a febrile time in the growth of archaeology. His accounts have been challenged and a considered biography is still awaited.[2]

He was born on 21 November 1931 in Norfolk, Virginia, at the height of the Great Depression. He described his upbringing as split between his father who was a union organiser for coal miners and his mother who lived for the nostalgic world of the antebellum South. He was married six times and three of his wives—Sally Binford, Nancy Medaris Stone and Amber Johnson—worked and wrote with him at different stages of his career. He had two children by his first wife, Jean; Martha, who was with him when he died, and Clint, who was killed in a car accident in 1976. He was elected a Corresponding Fellow of the British Academy in 1997 and awarded honorary degrees from the Universities of Southampton (1983) and Leiden (2000). He was honoured by the Royal Anthropological Institute (1986) and the Swedish Archaeological Society (1990). He outlived many of the enemies he had made in the USA and eventually was elected to the United States National Academy of Sciences (2001) and given a lifetime achievement award by the Society for American Archaeology (2008). In 2011 asteroid 213629 was named in his honour by the International Astronomical Union.

Binford was enrolled in the Virginia Polytechnic Institute (Virginia Tech) from 1948 to 1952, where he studied forestry. He never pursued that career and developed instead a curiosity about anthropology after enlisting, for financial reasons, in the US Army. He served in Okinawa and his first archaeological paper on the 'Prehistoric Ryukus' appeared as a feature section in the March edition of *Far East Stars and Stripes* in 1953. A year later he enrolled for a BA in Anthropology at the University of North Carolina, graduating in 1957, and a year later completed his MA at the University of Michigan. The anthropology he was taught had been established fifty years earlier by Franz Boas and comprised four closely

[1] L. R. Binford, *An Archaeological Perspective* (New York, 1972); L. R. Binford, *In Pursuit of the Past* (London, 1983); L. R. Binford, *Working at Archaeology* (New York, 1983); L. R. Binford, *Debating Archaeology* (New York, 1989).

[2] J. B. Griffin, 'Some suggested alternations of certain portions of *An Archaeological Perspective*', *American Antiquity*, 41 (1976), 114–19; D. J. Meltzer, 'Lewis Roberts Binford November 1931–2011: a biographical memoir', *National Academy of Sciences* (Washington, DC, 2011); P. W. Sabloff, *Conversations with Lew Binford: Drafting the New Archaeology* (Norman, OK, 1988); C. Renfrew, 'An interview with Lewis Binford', *Current Anthropology*, 28 (1987), 683–94.

related fields—prehistoric archaeology, and cultural, physical and linguistic anthropology.[3] Subsequently, under the lead of Julian Steward,[4] these combined fields produced a distinctive, neo-evolutionary approach known as cultural ecology that examined adaptation to the environment as the basis for change in human societies.

What Binford absorbed from cultural ecology was a dynamic, process-driven view of human behaviour where culture was an 'extrasomatic' means of adaptation according to Leslie White—anthropologist, Marxist, ardent neo-evolutionist and one of Binford's teachers at Michigan.[5] A dynamic approach to past human societies was needed in order to understand variation in technology, settlement and cultural customs, while the accent on energy capture provided a framework for understanding how and why societies changed. By contrast, the archaeologists who taught him, and he singled out James B. Griffin, were interested only in defining excavated assemblages by time and place: the culture history approach. When it came to explaining why assemblages and archaeological traditions changed the answer they often gave was that culture was ready. Binford found this unsatisfactory.

One important development in the archaeological landscape helps explain the revolutionary position that Binford took in his critique of the descriptive culture history approach. In 1949 the chemist Willard Libby had successfully demonstrated the basis of radiocarbon dating. By 1960 there was an ever-growing number of these science-based dates. These had two main impacts. They established the chronology of archaeological periods such as the Neolithic in absolute terms, and they paved the way for archaeology to become a comparative subject at a global scale. Archaeologists now had a scientific grasp on chronology that had previously eluded them and a new opportunity to examine human prehistory across the world. The time depth was impressive. Radiocarbon in 1960 could extend back to about 30,000 years ago, while other radiometric methods such as potassium-argon dating provided ages for our earliest ancestors. In 1961 the volcanic tuffs at Olduvai Gorge, Tanzania, which lay above sediments with archaeological and fossil remains, were assigned ages of 1.8 million years.[6]

[3] F. Boas, 'The history of anthropology', *Science*, 20 (1904), 513–24.
[4] J. H. Steward, *Theory of Culture Change* (Urbana, IL, 1955).
[5] L. A. White, *The Evolution of Culture: the Development of Civilization to the Fall of Rome* (New York, 1959).
[6] L. S. Leakey, J. F. Evernden and G. H. Curtis, 'Age of Bed I, Olduvai Gorge, Tanganyika', *Nature*, 191 (1961), 478–9.

This dating revolution transformed archaeology. The division between a human past that was geological rather than archaeological no longer existed. Rates of cultural change and comparisons of contemporary archaeological cultures in different environments could now be profitably made. And the study of stone tools, an element in Binford's PhD, was liberated from the ambivalence of their two traditional roles; marking time and defining culture. But exploiting the potential of a dating revolution needed a similar seismic shift in the conceptual frameworks applied to data in the past and it was here that Binford concentrated his fire.

He completed his PhD at Michigan in 1964, by which time he had published a series of papers which were the call to arms for what came to be known as the New Archaeology. In the United States this was the third such revolution to carry the description New Archaeology since Boas's formulation of the four fields in 1904. The first occurred in the 1910s when a revolution in stratigraphic methods unlocked chronological and comparative methods such as seriation. The second came in the 1940s and was associated with Steward's cultural ecology, where the ethnography of Native North America was central to its success.

Binford's version of a New Archaeology built on its two predecessors by driving the subject away from being the handmaiden of history and towards the arms of science. This was a processual archaeology as flagged in his paper 'Archaeology as anthropology'.[7] Here he presented culture as a process and outlined a model of systems and sub-systems which served to regulate it. The debt to Steward's cultural ecology and White's neo-evolutionary agenda is apparent. He then set out 'A consideration of archaeological research design' that was a programme of methods to investigate archaeological evidence in its dimensions of space and time.[8] In both papers he relentlessly insisted on formulating and testing hypotheses, following a research design, stating assumptions and questions and quantifying the evidence. All these steps were necessary to break the circle which claimed that culture explained culture. Only when this had been achieved could the potential of archaeology as an historical and anthropological science be realised and explanations provided for what happened in the past.

The reaction to his programme was positive among postgraduates and early career researchers and largely negative from those who already held tenure. The latter distrusted his insistence that archaeologists should be explicit in their assumptions and use theory robustly. On many occasions

[7] L. R. Binford, 'Archaeology as anthropology', *American Antiquity*, 28 (1962), 217–25.
[8] L. R. Binford, 'A consideration of archaeological research design', *American Antiquity*, 29 (1964), 425–41.

Binford was accused of bringing both science and theory into archaeology to the detriment of the subject. This could be heard in a 1971 BBC Radio interview with British archaeologists Colin Renfrew, a supporter of Binford's New Archaeology that he applied to the emergence of civilisation in Greece, and Jacquetta Hawkes, archaeologist and author of the best-selling *A Land*,[9] best described as a dream of deep-time. Hawkes was deeply suspicious of American jargon in particular and theory in general. Her view of history could not be more different from Binford's and their on-air disagreement defined the edges of the gulf between the new and the old archaeology.

Binford's main theoretical source was Carl Hempel's logical empiricism. In particular Hempel's notion of a covering law, stated as hypotheses and tested against data, offered much to a discipline such as archaeology that had hard evidence but an underdeveloped theoretical position. What Binford brought into a theory-averse archaeology was a much-needed systematisation of practice. In a paper presented to the University of Chicago in 1960 he set out his stall; 'anthropology should be a science and … scientific method proceeds in the context of complementary inductive-deductive methods executed in the context of theory'.[10] Throughout his career he kept to this scientific path. He parted company with cultural ecology, claiming that Steward's regional work was inductive and only achieved empirical generalisations rather than explanations.[11] Hence it fell short of a deductive approach such as Hempel's, and later Popper's, that Binford adopted. He saw his task as fashioning a stronger theoretical base and this was set out in another key work of the New Archaeology, 'Archaeological systematics and the study of cultural process'.[12] The paper was published in the year that he left a teaching post at the University of Chicago to take up another at Santa Barbara.

His time in California (he moved to UCLA in 1966) was extremely productive, culminating in an edited volume with his third wife Sally Binford: *New Perspectives in Archaeology*.[13] This volume showcased studies by the New Archaeology's fellow travellers and graduate converts. Binford wrote in the introduction that, 'The practical limitations on our knowledge of the past are not inherent in the nature of the archaeological record; the limitations lie in our methodological naiveté, in our lack of

[9] J. Hawkes, *A Land* (London, 1951).
[10] Binford, *An Archaeological Perspective*, p. 113.
[11] Ibid., p. 111.
[12] L. R. Binford, 'Archaeological systematics and the study of cultural process', *American Antiquity*, 31 (1965), 203–10.
[13] S. R. Binford and L. R. Binford (eds.), *New Perspectives in Archaeology* (Chicago, 1968).

development for principles determining the relevance of archaeological remains to propositions regarding processes and events of the past'.[14] Here was an optimistic archaeology that instead of apologising for its patchy data, set out a route map for change, albeit one that involved in his view a wholly scientific framework. By way of example his paper on 'Post-Pleistocene adaptations' in the volume on *New Perspectives in Archaeology* proposed a radical reinterpretation of the transition to agriculture in the Near East and where demography formed a key part of the explanation.[15] The origin of farming was a topic he repeatedly returned to throughout the rest of his career.

Binford and the Neanderthals

The years in California also saw a second major theme emerge in Binford's archaeology. The geographical focus was again in the Old World but this time centred on France. While accompanying Sally Binford on her excavations in France and Israel, Binford had become interested in the work of the French Palaeolithic archaeologist François Bordes. At the time Bordes was excavating the caves of Combe Grenal and Pech de l'Azé in the Dordogne that were rich in stratigraphic levels containing assemblages of stone tools left behind by successive Neanderthal occupations.[16] Bordes regarded himself as a geologist rather than an archaeologist. He classified these stone tools according to their typology and technology, the way they were knapped. Throughout these sequences, and elsewhere in the region, he had identified five variants among these assemblages which he explained as five Neanderthal cultural groups, or tribes. So began a classic debate over how to explain variation in assemblages of archaeological evidence. Bordes, who became a close friend, was a culture historian who saw his job as describing variation and explaining it by the simple rule that culture explains culture. Binford saw this as an opportunity to show how these stratigraphically well-ordered assemblages could be accounted for differently if a shift in conceptual approach took place. The result was a detailed factor analysis of the assemblages that he published with Sally Binford as 'A preliminary analysis of functional variability in the Mousterian of

[14] L. R. Binford, 'Archaeological perspectives', in Binford and Binford (eds.), *New Perspectives*, pp. 5–32, at p. 23.
[15] L. R. Binford, 'Post-Pleistocene adaptations', in Binford and Binford (eds.), *New Perspectives*, pp. 313–41.
[16] F. Bordes, *A Tale of Two Caves* (New York, 1972).

Levallois facies'.[17] Here they tested propositions about behaviour in the past. They concluded that the five variants represented two different behavioural stances, or tool kits, that were linked to a Neanderthal settlement system. There were base camps where basic maintenance activities such as food preparation, tool manufacture and consumption took place and then there were task sites where resources such as animals and stones were extracted from the environment.

The Binfords' approach and interpretation had instant impact. Patterns in the data were assessed statistically and for the first time seemingly intractable stone tools had been infused with an anthropological dynamic, albeit a simple one of function and settlement type. But compared with the culture historians with their rigid adherence to description and a belief in culture as its own explanation, this study of variability was groundbreaking. The impact was further guaranteed by the debate it engendered with Bordes and then Paul Mellars. The latter had completed his PhD on the same material and argued strongly that there was also a developmental trend in the assemblages that the Binfords' analysis ignored.

Binford and the Nunamiut

Binford's latest New Archaeology had seemingly achieved its goal of paradigm shift. Horizons had been expanded in areas such as sampling theory, demography, mortuary data, use of statistics, computing, scientific method and the study of behaviour. Understanding the causes of variability in archaeological evidence was now recognised as a major concern. Moreover, if these issues were relevant for Neanderthals then by implication they applied to the whole of archaeology.

But at the moment of his success Binford realised that he had only reached the foothills and that much work still needed to be done. In 1968 he moved to the University of New Mexico, Albuquerque, where he would become an inspirational teacher of graduate students for the next two decades. Soon after he divorced from Sally Binford and married Mary Ann Wilson, who gave him great support and happiness until her sudden death in 1984. At New Mexico he became disillusioned by the direction that the New Archaeology was taking. He felt that he still understood little about the causes of Neanderthal variability.

[17] L. R. Binford and S. R. Binford, 'A preliminary analysis of functional variability in the Mousterian of Levallois facies', *American Anthropologist*, 68 (1966), 238–95.

His solution was to conduct extensive fieldwork among the Nunamiut community in northern Alaska. His goal was to observe a society of hunters over an annual cycle and to use this experience to understand how patterned residues result from economic activity in an unforgiving environment. In his words he was interested in the link between the statics of archaeological evidence and the dynamics of behaviour which produced them.

The fieldwork took place between 1969 and 1972 in the Anaktuvuk Pass in the Brooks Range. Binford and his students studied all four seasons and amassed a wealth of information on caribou hunting, settlement location and demography. Binford was not the first to pursue an ethno-archaeological approach to understand the past by refining the use of analogy in the present. Richard Gould and James O'Connell had lived with hunters and gatherers in Central Australia, Ian Hodder studied the spatial patterning of culture among pastoralists in East Africa and Patty Jo Watson documented villages in the Middle East. It was, however, the scale of Binford's Nunamiut work and the way he extracted general principles from it to illuminate archaeological process that make it stand out. Binford described the Nunamiut as pragmatic, empiricist and sceptical of the 'right' way to do something;[18] principles which he respected but in the case of the first two did not always observe.

At the heart of the work is his detailed study of how the Nunamiut hunt, butcher, store and consume caribou, published in his monograph *Nunamiut Ethnoarchaeology*.[19] His focus on bones was deliberate. Animal skeletons, he argued, are constants between the present and the past. What varies is the way humans use them. For example, the parts of the carcass and its skeleton differ predictably in the amount of high-value foods they contain while the animal's condition varies according to the season. Both aspects affect the hunter's decisions. Among the constraints on their choices are the requirements of storing some of the kill for those periods of the year when the caribou are far away from Anaktuvuk village where the dogs and humans needed food. The food webs he constructed were intricate maps that criss-crossed the times and spaces inhabited by the Nunamiut. To investigate these he devised new methods of analysis which soon became standard in archaeological studies of economic anatomy. At a stroke the 'simple' lives of hunters were revealed as a web of complex decisions, which Binford argued were driven by security rather than the need to minimise risk.

Nunamiut Ethnoarchaeology set a high bar for those who followed. The amount of information that was now potentially recoverable from

[18] L. R. Binford, *Nunamiut Ethnoarchaeology* (New York, 1978), p. 454.
[19] Ibid.

animal bones became daunting. But while many adopted his methods to characterise archaeological assemblages of bones in terms of bulk and gourmet strategies or to look for patterns of fragmentation indicative of either boiling for grease extraction or breaking for marrow, the central message of the work became confused in the rush for new detail. For Binford this message was about the appropriate learning strategy that could bridge the present with the past; to breathe some of the dynamics of actual behaviour into the inert materials which archaeologists dig up. He was dismayed that the book became a source for methodological recipes about small aspects of behaviour. However, he was more successful in achieving his central goal with other papers derived from his Nunamiut work. These included settlement systems, the recycling (or as he called it curation) of technology and the use of regions and landscapes. The observations challenged archaeologists' preconceptions about how the past worked. Time and again Binford showed how behaviour is multidimensional and that archaeologists have flattened perspective, hence undervaluing their sources of information that allow them to study the past from the moment to the millennium.

For example, his study of settlement patterns contrasted the low-latitude hunters and gatherers of the Kalahari with the hunters of the Arctic.[20] Using the two cases as extremes he related their differences to the length of the growing season and the distribution of resources. The contrasts were manifested in the two systems through a typology of settlements and a different strategy of tool maintenance and discard. The model of collector (high latitude, Arctic) and forager (low latitude, Kalahari) produced very different patterns in artefacts, sites and regional settlement for the archaeologist to study.

Another example was his spatial study of an open-air hunting stand just outside Anaktuvuk village.[21] Here men waited for the caribou to appear. They passed the time with target practice, making masks to sell, chatting, playing cards, eating and sleeping. While they went about their business Binford recorded where things were dropped around the hearths and measured the patterns as though they were from an archaeological excavation. He found that the size of objects, rather than what they were, formed the strongest spatial pattern of concentric circles around the

[20] L. R. Binford, 'Willow smoke and dogs tails: hunter-gatherer settlement systems and archaeological site formation', *American Antiquity*, 45 (1980), 4–20; L. R. Binford, 'The archaeology of place', *Journal of Anthropological Archaeology*, 1 (1982), 5–31.

[21] L. R. Binford, 'Dimensional analysis of behavior and site structure: learning from an Eskimo hunting stand', *American Antiquity*, 43 (1978), 330–61.

fireplaces. This pointed to another constant that bridged the present and the past; the size of the human body. His simple observations challenged the idea of how a specialist site such as a hunting stand should appear to an archaeologist. There were no slaughtered caribou and the spent cartridges had not been fired at any animal. Instead he had mapped everyday activities that invariably produce a strong spatial pattern in data created yesterday or 20,000 years ago.

Binford and myths

One goal of Binford's ethno-archaeological studies was to improve the methods that archaeologists use to make inferences about the past. These concerns had been taken up much earlier in the fields of vertebrate palaeontology where they were referred to as taphonomy, the laws of burial. As developed by one of his former graduate students Michael Schiffer,[22] these formation processes involved natural and cultural transforms. Binford referred to this as doing middle range theory. Both Binford and Schiffer regarded archaeological evidence as a record of past behaviour. They were concerned with how the archaeological record had been formed by processes ranging from the geological and geomorphological to the biological.

The aim of all these studies was to characterise more accurately and in a scientific manner the record of evidence about the past. But here opinions differed. Many archaeologists wanted to use middle range theory to identify the processes which had modified the record. Their goal was to remove bias from this record in order to see it in as pristine a form as possible. Others regarded the overprinting of taphonomy as the addition rather than the removal of information. They saw the changes wrought by rivers, ice and animals as the route to human behaviour in the remote past.

Binford's intervention in this debate about the nature of the archaeological record was transformative. In 'Behavioral archaeology and the Pompeii premise',[23] he returned to Robert Ascher's observations twenty years earlier that archaeology begins when replacement ceases and what the archaeologist interrupts is the process of decomposition.[24] Binford wanted to use his ethno-archaeological studies to return to that position

[22] M. B. Schiffer, *Behavioral Archaeology* (New York, 1976).
[23] L. R. Binford, 'Behavioral archaeology and the Pompeii premise', *Journal of Anthropological Research*, 37 (1981), 195–208.
[24] R. Ascher, 'Analogy in archaeological interpretation', *Southwestern Journal of Anthropology*, 17 (1961), 317–25.

and so reverse Schiffer's concept that the goal of the archaeologist is to regain a snapshot of the past, that Pompeii moment, because that is when behaviour is best preserved. On the contrary, the archaeological record for Binford was not a series of freeze-frames but a palimpsest of data created by agencies, some of them behavioural, but not necessarily human, and others mechanical.

Binford's debt to Ascher shows that his position was not original. But his critique, either of a leading processualist such as Schiffer, or of older theoretical positions, prevailed because it was backed by ethnographic insight of actual conditions. The treatment of caribou carcasses by the Nunamiut was a case in point. By the time these had been transformed into a pile of fragmented, and sometimes regurgitated, bone scraps it was hard to think of anything less pristine or Pompeii-like. Yet Binford showed with each chapter in the biography of these bones that more information was added as they resembled less and less the animal from which they originated. The processes involved field-butchery of the caribou carcass after which parts of it were fed to dogs, cooked and eaten by people, stored for the future and then discarded. His study turned on its head the notion that the best archaeological data are well preserved and *in situ*, while those that are badly ravaged by time and decay are of lesser value. And this was precisely why Binford had become disillusioned by the New Archaeology ten years earlier. In his view archaeologists had an unrealistic model of what their data represented. By using an analytical framework based on scientific principles to create knowledge he began to deliver on that optimistic statement of 1968 and where it was 'methodological naiveté' that stood between the archaeologist and 'knowledge of the past'.

Of course, only a few archaeologists were interested in the detailed lessons of economic anatomy that he had learned from the Inuit in Alaska. How could such knowledge illuminate questions about the ancient empires or the development of religion and urbanism throughout the old and new worlds? Furthermore, such detailed anatomical studies did not interest cultural anthropologists within the American four-field structure. So how did a study on the margins of archaeology and anthropology achieve such importance?

There are at least four answers. In the first place the New Archaeology had nurtured an interest in method and theory. This appetite needed to be fed. Second was the person who did the feeding. Binford was a charismatic speaker. He was an inspired story-teller, or in his terms pattern-recogniser, who could captivate an audience with the most commonplace data. Moreover, in the effervescence of the occasion he would not let an

inconvenient fact stand in the way of a good story. As he spoke the marginal and the mundane only grew in importance to become central to the study of the past. The role of the archaeologist lay in making the smallest detail relevant. Third, archaeologists have always prided themselves on their craft. The skills of excavating loom large in histories of the subject as shown by the first New Archaeology's stratigraphic revolution and the many texts on sampling and excavation technique. By systematising their skills through a scientific approach archaeologists added to their professional identity. Binford's early contributions were to prove long lasting.[25]

Finally, the appearance of being at the margins needs qualification. The study of hunters and gatherers had received a major interdisciplinary synthesis in the *Man the Hunter* (1968) symposium and to which Binford contributed.[26] The volume was a triumph for the four-field approach, bringing together cultural anthropology, biological anthropology in the guise of primate studies and human palaeontology, linguistics, demography and archaeology. The approaches were predominantly environmentally based and hence derived from the Steward school of cultural ecology thirty years previously, but now with a harder evolutionist perspective. They were also comparative in tone with a global coverage of modern hunters and a time depth provided by the archaeologists.

Contemporary hunters and gatherers were therefore pushed from the margins of anthropology into its centre. Following the lead of *Man the Hunter*, Binford took his Alaskan data and applied them to the interdisciplinary study of human origins.[27] This involved a synthesis between biological anthropology, Palaeolithic archaeology and quaternary science. These three sub-disciplines had emerged as the field of Palaeoanthropology following the seminal fieldwork by the Leakeys in East Africa.

When he applied his Alaskan findings to the Olduvai record he felt he was exposing another set of myths every bit as strong as the Pompeii premise. His assault started with *Bones: Ancient Men and Modern Myths*,[28] which was published in the same year as the South African palaeontolo-

[25] Binford, 'A consideration'; L. R. Binford, S. R. Binford, R. Whallon and M. A. Hardin, *Archaeology at Hatchery West* (Washington, DC, 1970).
[26] L. R. Binford, 'Methodological considerations of the archaeological use of ethnographic data', in R. B. Lee and I. DeVore (eds.) *Man the Hunter* (Chicago, 1968), pp. 268–73.
[27] L. R. Binford, 'Human ancestors: changing views of their behavior', *Journal of Anthropological Archaeology*, 4 (1985), 292–327.
[28] L. R. Binford, *Bones: Ancient Men and Modern Myths* (New York, 1981).

gist C. K. Brain's *The Hunters or the Hunted?*.[29] These were both actualistic studies but in different environmental settings. In both regions the importance of carnivores such as leopard, lion and hyena in South Africa and the wolf in Alaska as agents of bone accumulation and destruction were documented. These actualistic studies allowed both researchers to question dominant interpretations of the remote past and where early humans usually were credited with collecting bones and establishing themselves at the top of the food chain by their hunting prowess. Both studies showed that many of the archaeological sites were instead the product of accumulations of bones by carnivores. Binford took the argument further and with his fifth wife Nancy Medaris Stone studied several of the key archaeological assemblages from the Old World.[30] He was convinced that the evidence from China, South Africa, East Africa, India and Europe pointed to our earliest ancestors making a living through scavenging rather than hunting. Indeed, those Neanderthals who had figured in the Mousterian variability debate were now, he argued, best portrayed as scavengers rather than hunters. Their new position in the food chain was however no longer based on prejudice but upon a scientific reading of the data. As far as Binford was concerned paleoanthropologists had been largely working in a non-scientific way and as a result had misunderstood the data they had uncovered. What he proposed met the demand of his optimistic archaeology of 1968 and where the 'relevance of archaeological remains to propositions regarding processes and events of the past' had finally been demonstrated.

Not everyone was convinced, particularly those working in Africa with primary data. Many interpretations were indeed exposed as myths about the past and they soon fell away. But his methodological onslaught also produced a reaction as might be expected in Hempel and Popper's approaches to science. Data were scrutinised and his and Stone's methods were challenged to the point where they could be accused of building their own myth about the earliest humans. However, Binford's role as catalyst should not be underestimated even though his reinterpretation of the fauna from the huge coastal cave of Klasies River Mouth in South Africa

[29] C. K. Brain, *The Hunters or the Hunted?* (Chicago, 1981).

[30] L. R. Binford and N. Stone, 'Zhoukoudian: a closer look', *Current Anthropology*, 27 (1986), 453–75; L. R. Binford, 'Etude taphonmique des restes fauniques de la Grotte Vaufrey, couche VIII', in J.-P. Rigaud (ed.), *La Grotte Vaufrey à Cenac et Saint-Julien (Dordogne), Paleoenvironments, chronologie et activités humaines* (Paris, 1988), pp. 535–64; L. R. Binford, 'Fact and fiction about the Zinjanthropus floor: an analysis of data, arguments, and interpretations', *Current Anthropology*, 29 (1988), 123–35.

was largely rejected.[31] His challenges led to some much-needed clearing out of dubious data and assumptions. And by redefining the agenda for human origins, which has always occupied a central place in the four fields of anthropology, he ensured that middle range theory was essential to the study of all the pasts which archaeologists studied.

His intervention also fed in directly to another major debate of the 1980s—the origin of modern humans. Here the choice lay between a late revolution in human culture which involved a rapid replacement of all indigenous peoples, such as the Neanderthals, by modern humans dispersing from Africa, and a continuity model which argued for parallel evolution in both biology and culture in different continents. When he applied his ethnographic studies to this major question he came down on the side of rapid replacement. Neanderthals were basically opportunistic scavengers who practised some hunting. By contrast his Alaskan experiences showed him that modern humans had the ability to think ahead, what he termed planning depth, and where they anticipated needs.[32] The Nunamiut showed this capacity by storing in one season for use in the next. However, demonstrating the storage of animal foods with archaeological data proved elusive. Instead he developed further his model of a curated technology and where planning depth led to a marked pattern of obtaining suitable raw materials and recycling tools when broken or worn out. As with stored food, what was found at a site was not necessarily an immediate reflection of what went on there. The raw material to make the tool might have come from many kilometres away and been manufactured at another location. It was very possibly broken elsewhere but brought back for recycling. These dislocations in time and space between an activity and the results of that activity becoming available to the archaeologist were a clear example of the problem with the Pompeii premise. It was difficult to show this with bones from ancient sites but with technology it was possible. Moreover, it fitted the Upper Palaeolithic evidence from Europe which showed significant shifts in the use and movement of stone tools compared with the Neanderthals that he had studied twenty years earlier.

[31] L. R. Binford, *Faunal Remains from Klasies River Mouth* (New York, 1984).

[32] L. R. Binford, 'Forty seven trips', in R. V. S. Wright (ed.), *Stone Tools as Cultural Markers* (Canberra, 1977), pp. 24–36; L. R. Binford, 'Organization and formation processes: looking at curated technologies', *Journal of Anthropological Research*, 35 (1979), 172–97; L. R. Binford, 'Isolating the transition to cultural adaptations: an organizational approach', in E. Trinkaus (ed.), *The Emergence of Modern Humans: Biocultural Adaptations in the Later Pleistocene* (Cambridge, 1989), pp. 18–41.

Binford's world model

With his unshakeable belief that the scientific approach was the only way to gain reliable knowledge about the past, it was inevitable that Binford would find his position challenged by other epistemological perspectives. This was not what he intended, however, when he wrote in his call to arms for a New Archaeology that 'we cannot afford to keep our theoretical heads buried in the sand'.[33] That was a plea for some theory, albeit one based on a science model, rather than no theory as was then the status quo. The growing reaction by archaeologists during the last thirty years has been to adopt, along with the humanities in general, a diversity of theoretical positions from post-colonial to phenomenology, from feminism to queer theory, and many more besides.

What is noticeable in Binford's writings is his narrow definition of theory and method. In broad outline he was a Darwinian in that he saw his task as explaining variety in the present and then accounting for similar variety regardless of where or when it was found.[34] But he never applied Darwinian methods. For example, his use of ecology paid little attention to the principles of evolutionary ecology as they developed during his career and he despised evolutionary psychology. Even the principles of socio-ecology were treated with suspicion. Binford's inclination to always go it alone can be traced to two sources; in the first place his early rejection of Steward's cultural ecology, on the grounds that it used empiricism rather than theory to make generalisations, and secondly that his Darwinian approach was filtered through White's brand of neo-evolution. But for all Binford's protestations, empiricism was also his method and the strength of Binfordian archaeology. As a result we have to find out what he meant by theory by seeing what he disliked in other theoretical approaches to the past.

This perspective is most apparent in his Huxley lecture to the Royal Anthropological Institute, 'Data, relativism and archaeological science',[35] which he used as an opportunity to affirm his belief in science as the only route to knowledge about the past. He criticised participant ethnography for producing a view of culture that was in people's heads and therefore profoundly inaccessible to archaeologists. His strategy was clear:

[33] Binford, *An Archaeological Perspective*, pp. 31–2.
[34] L. R. Binford, *Constructing Frames of Reference: an Analytical Method for Archaeological Theory Building using Ethnographic and Environmental Datasets* (Berkeley, CA, 2001), p. 10.
[35] L. R. Binford, 'Data, relativism and archaeological science', *Man*, 22 (1987), 391–404.

> Science works responsibly. We create our data in the present. We seek through pattern recognition studies to gain an insight into how the past was organised. We propose ideas as to the nature of past organisations and how they changed. At this juncture the scientist is responsible for seeking out experiences as widely as possible in order to provide reality checks on the accuracy and utility of his ideas.[36]

In his opinion anyone not following such an approach was engaged in literature rather than archaeology.

But the critiques and alternative epistemologies did not go away. And if they were muted in America, where the Binfordian approach had become the norm, they were strident in Europe. Here the theory-genie which the New Archaeology had released from the bottle of disciplinary tradition was allowing fresh interpretations of material culture, place and landscape that aligned more closely with cultural geography and social anthropology. It is noticeable, however, that the field of human origins and palaeoanthropology was largely untouched by these theoretical explorations. Instead the theoretical smorgasbord was enthusiastically applied to the farmers of prehistory, stone, bronze and iron, and eventually to all the literate societies of the Old World. A unified approach to the study of the past which, momentarily, the New Archaeology achieved was now fractured along lines reminiscent of older divisions between geology and history.

Binford's reaction was predictable. He kept on attacking but he also embarked with the help of Nancy Medaris Stone and several post-graduates, one of whom, Amber Johnson, would become his last wife, on what he regarded as his definitive statement. This coincided with his move in 1991 to the Southern Methodist University in Dallas. His subject was contemporary hunters and gatherers and he returned to earlier considerations of how and why they varied against an environmental background. This ambitious work took much of his energy in the decade before its publication in 2001 as *Constructing Frames of Reference: an Analytical Method for Archaeological Theory Building Using Ethnographic and Environmental Datasets*. He dedicated it, among others, to Julian Steward.

The result was a massive compendium of 339 hunter-gatherer societies the data from which he used to test hypotheses that cover everything from kinship relations to the number of people round campfires and the proportion of fish in the diet. The purpose of the book was to show how ethnographic data could be used by archaeologists so that they became

[36] Ibid., 403.

better at understanding and explaining the past. *Frames of Reference* is divided into four sections that present in great detail Binford's approach to an anthropology of the past, but now with a much greater emphasis on climate and ecology to examine what he termed niche variability among hunter-gatherer societies. In the final section he presented a reworking of his influential 1968 paper on 'Post-Pleistocene adaptations' and where he addressed the issue of how social complexity emerged.[37]

The scale of *Frames of Reference* is monumental and global, tabulating in detail the variety of hunter-gatherer solutions to survival. It is a fertile text liberally sewn with propositions, generalisations and scenarios that are often insightful and provocative like a Binford talk, but also obscure and pedantic like his writing. To provide the flavour here are two at random:

> Generalization 11.01: there is a strong relationship between the number of species prepared for storage and the degree of ranking and complexity in the jurisdictional hierarchies of the social system.[38]
>
> Proposition 11.15: Other things being equal, mutualist and forest product specialisations appear to be intensificational responses in environmental settings in which aquatic resources are not viable subsistence alternatives for otherwise moderately mobile peoples.[39]

Taken out of context the style of presentation seems anachronistic. But it is entirely consistent with Binford's career that began with a call for explication, explanation and quantification, and encapsulates his commitment to a transparent scientific process.

The response to *Frames of Reference* has been positive.[40] It has been used by researchers from a wide range of disciplines to examine issues in small-scale societies and in particular the cultural transmission of cultural traits under Darwinian selection. However, close scrutiny of Binford's data raises some questions about their reliability. Furthermore, his go-it-alone approach led him to develop his own system of calculating environmental variables. This worked well when analysing the ethnographic dataset, but when applied to archaeological evidence the idea that the climate at named sites could be reconstructed with a resolution of 200-year intervals over 40,000 years was regarded with scepticism.

[37] Binford, 'Post-Pleistocene adaptations', 18.
[38] Binford, *Constructing Frames of Reference*, p. 401.
[39] Ibid.
[40] A. L. Johnson (ed.), *Processual Archaeology: Exploring Analytical Strategies, Frames of Reference, and Culture Process* (Westport, CT, 2004)

But these are issues and criticisms which any work of this scale and scope will attract. What remains is a personal vision of how the world works and worked. No other archaeologist has either attempted or even partially succeeded in bridging the present and the past on such a scale and with such a wealth of insight. It stands as the prime example of the opportunity archaeology provides to examine human activity in all its manifest scales of time, space and complexity. It opens up an understanding of deep-history that did not exist when Binford began his intellectual journey and it will remain as the legacy of a unique vision.

Reflections on a baby grayling

In the fifty years since he published 'Archaeology as anthropology', Lewis Binford changed the methods, questions and aspirations of archaeology. He did not achieve this single-handed but it is difficult to imagine modern archaeology without the loud and decisive role that his voice played. He accomplished what few manage, a paradigm shift, and for a long time to come the basic Binfordian agenda will be taught in archaeology departments throughout the world. He was an original thinker who unchained archaeology from its obsession with typology and writing the histories of archaeological cultures as though that was an adequate account of the past. He spoke to many, but listened to few. Those he did listen to and learn from were the Nunamiut men and women who put up with his questions, as in this story, told to him by Simon Paneack, about the baby grayling who swam with his mother in Tulugak Lake, Alaska:

> [Baby grayling] asked his mother how he could always be sure of getting enough to eat. Mother grayling was silent for a moment, then in a very serious voice said … 'Always swim against the current and the water will bring your food to you.' Baby began swimming against the current and sure enough little pieces of food came past him … Soon baby grayling was up in a small side stream feeding into Tulugak Lake, but he kept following the rule, swimming against the current, and soon he began to notice there was less and less food, less and less water … Pretty soon there was no more food and very little water! Baby grayling was very upset, he turned and swam back into the warm waters of Tulugak Lake, where he saw his mother but avoided her. He hated her for telling him the wrong rule! *You [Binford] asking me questions is like baby grayling; I can give you an answer but you must spend the rest of your life learning when not to use it*.[41]

[41] Binford, *Nunamiut Ethnoarchaeology*, p. 454.

'Swimming against the current' is an apt description of Binford's archaeological career and his intellectual perspective. He transformed archaeology but in doing so he raised two paradoxes. The first is about his trademark theory. Although he is regarded widely as the person who brought theory into archaeology, what he understood by it was restricted to scientific method and practice. In fact what he argued against for much of his career was adopting any theoretical approach above the level of normal scientific procedure.

The second paradox that he left to archaeology stems from his insistence that the principles to investigate the past are universal and encompass all archaeological data from the present day to the earliest stone tools. To demonstrate how this might be understood he played the margins brilliantly. He transformed the lowly status of the Palaeolithic and hunting societies into general propositions about studying past behaviour through case studies that everyone with an interest in seeing archaeology develop as a discipline had to read. But it is unlikely that a *Frames of Reference* will ever be written for agricultural or state-level societies. And this is the paradox; in seeking to make a unified field of archaeology he instead accentuated the fault line that has always run through the past and which hinges on the appearance of agriculture. He showed how to bridge the initial phases and in lectures made the claim that 'the farmers were the failures', without implying that hunting and gathering was a golden age from which humanity had fallen. It was rather the case that his approach to the past could reach only so far up the beach of human society until the wave receded under the complexities and scale of what it had to achieve. But before those footprints in the sand dissolved, he had thrown a mighty rock into the path of knowledge about who we are and how we came to be.

CLIVE GAMBLE
Fellow of the Academy

Note. Corresponding Fellows do not normally receive a Biographical Memoir. By special dispensation of the President this has been allowed in recognition of Binford's importance to archaeology. I am grateful to David Meltzer for sharing his biographical memoir of Lewis Binford written for the National Academy of Sciences and Amber Johnson for her insightful comments. I would also like to thank Robert Foley, FBA, for perceptive observations on an earlier draft. The photograph is reproduced with permission of the Pickler Memorial Library, Truman State University.