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An archaeology of the instant?

Action and narrative in microscopic archaeological residue analyses

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ABSTRACT

The discovery and interpretation of microscopic residues on stone artefacts is an expanding front within archaeological science, allowing reconstructions of the past use of specific tools. With notable exceptions, however, the field has seen little theoretical development, relying largely on a rationale in which either individual findings are widely generalized or the age of the site determines the importance of the results. Here an approach to residue interpretation is proposed that draws on notions of narrative, scale, action and agency as one means of expanding the theoretical scope and application of residue studies. It is suggested that the individual resonance of the findings of residue analyses with people in the present day can be used to provide a more nuanced understanding of past actions, which in turn allows both better integration and communication of those findings within and outside the archaeological community, and begins to overcome the problems associated with the typically small sample sizes analysed in stone-tool residue studies.

KEYWORDS

agency ● microscopy ● narrative ● residue analysis ● scale ● stone tools

■ INTRODUCTION

... that is, those occasions when archaeological evidence of exceptional quality brings us face to face with other human beings across tens, hundreds or even thousands of millennia, by showing us not merely the generalities of their existence from which we can deduce the kinds of activities they *might* have pursued, but quite specific incidents which undeniably took place, enabling us to *know* exactly what certain individuals did and how they did it on some particular occasion, whether of a special or routine nature. (Roe, 1980: 107; emphasis in original)

Over the past century, archaeologists have adopted, developed and integrated methods from other disciplines in their efforts to gain a more reliable grip on past human actions. Collectively, many of these methods can be placed under the rubric of archaeological science (Pollard, 2004), with the developments within this field broadly characterized by a search for ever greater precision and ever more detailed analysis. Among the more recent of the approaches taken from the biological and mineralogical sciences is the use of microscopes to investigate the residues adhering to artefacts, in an attempt to discern the past use(s) of particular tools. This article is concerned with the study of residues on stone artefacts, as this is by far the most common type of microscopic residue analysis, although the issues discussed are applicable to studies of other material types. References to 'residue analysis' in the remainder of this article should therefore be taken as shorthand for 'microscopic stone-tool residue analysis', and all comments considered in this light. This article explores the notion of an 'archaeology of the instant' as a potential means of expanding the scope and relevance of typically small-scale residue studies. It does so by drawing on social archaeological theory and focusing on the micro-scale actions – essentially occurring over the timescale of an instant – revealed on each artefact by residues. It should be noted that the aim of this article is to bring the potential of microscopic residue analysis to a wider audience, not to supplant or dismiss the essential work which has formed the backbone of residue studies to date.



■ STONE-TOOL MICROSCOPIC RESIDUE ANALYSIS

The refinement of techniques for investigating artefact function has greatly enhanced our understanding of the roles of stone artefacts in past societies. Initial application of use-wear studies, as exemplified by Semenov (1964) during the 1940s and 1950s, was followed in later decades by the development of high and low magnification characterization of actual adhering residues resulting from use-contact (Fullagar et al., 1996; Hayden, 1979). To a certain extent, early debate over microscopic stone-tool residue analysis was driven by interest in blood films (e.g. Gurfinkel and Franklin, 1988; Kooyman et al., 1992; Loy, 1983; Smith and Wilson, 1992), and the associated potential for faunal species identification. In the last decade of the twentieth century, a steady increase in the number and foci of stone residue analysts saw the 'bloodstain' emphasis diminish, and the field is now characterized by diverse chronological, spatial and material interests.

The current roles of stone residue analysis can be summarized as follows:

- 1 assessing the viability of functional typologies which were based on form or raw material (e.g. Perry, 2005; Robertson, 2005; Weisler and Haslam, 2005);
- 2 finding evidence for subsistence/craft activities, often reported as plant versus animal processing (e.g. Briuer, 1976; Fullagar, 1992);
- 3 investigating old/rare artefacts for further information (e.g. Loy, 1998; Piperno et al., 2004);
- 4 examining activity areas and mobility through, for example, studies of use versus non-use (e.g. Fullagar and Jones, 2004);
- 5 acting as a source of materials for further study, including ancient DNA or radiocarbon dating (e.g. Nelson et al., 1986; Williamson, 1997).

While it is not an explicit focus in the literature to this point, I believe we could add to this list the tangible link residues provide to past actors through the specific actions recorded on the artefacts. The development of new theoretical avenues for stone residue analysis to explore has not, however, kept pace with the spread and development of methods. Despite the varied roles listed above, the majority of residue studies published in the past few decades tend to be characterized by questions addressing subsistence, and limited investigation of manufacturing or craft activities extrapolated from small samples to sites or regions. Taphonomic concerns over residue survival (e.g. Barton et al., 1998; Cattaneo et al., 1993; Haslam, 2004) have left analysts able to interpret only extant residues as meaningful, with the absence of residues not necessarily equating to non-use of a tool (Odell, 2001).

As in many archaeological sub-fields, questions of origins (usually framed as 'first' or 'earliest' examples of specific plant use, or specific artefact-type use) have also been important. One consequence is that in many cases the significance of the residue study is drawn not only from the findings or the activities identified, but from the age or rarity of the analysed artefact. Recent articles in the international literature (Denham et al., 2003; Piperno et al., 2000, 2004) have emphasized this trend. As such literature receives widespread attention, to a large extent it determines the visibility and perceived role of residue studies for both non-specialist archaeologists and the interested public alike. In truth, it may be that the successes achieved by residue studies to date have tended to mask, or at least distract from, the potential for pursuing alternative methodological avenues. There are strong reasons for continuing to employ residue analysis in the investigation of important early sites, but if we can at the same time move beyond documenting the use of a few artefacts as examples of general trends to interpreting individual artefacts in their own right, we will open up new possibilities for investigating past social activities.

The potential for residue studies to be employed in investigating social environments is yet to be fully realized, although valuable contributions have been made, notably by Richard Fullagar and his collaborators (e.g. Akerman et al., 2002). For example, Fullagar and Bruno David (1997) discuss the residue study of the stone assemblage from a test pit at Ngarrabullgan Cave in Queensland, Australia, which dates back to ca. 37,000 BP. While the findings from one artefact in the earliest levels are again emphasized as being 'one of the oldest cases of starchy plant use in the world' (Fullagar and David, 1997: 141), an attempt to tie the social aspects of Aboriginal use and beliefs concerning the site (see David, 2002) to the residue results signals the viability of such projects. In part it is David's interest in agency and intentionality that allows the communion of functional and contextual ideological evidence, and the recognition that 'an object's intended functions can be examined from the material traces of use, such as residues on stone tools . . . but the intentionality of the effects of such uses cannot be directly known from the objects themselves' (David, 2004: 67). Fullagar's work with Robin Torrence in Papua New Guinea (Fullagar, 1992; Fullagar et al., 1998) on group mobility and responses to an unstable environment provides another example of just how social interaction may be elucidated through residues. In each of these cases, however, specific artefacts are still generally considered as representative of an assemblage as a whole. It is on the potential for dealing with the actions represented by each tool within a small sample, largely independently, that I wish to focus here. It may be suggested that this focus creates a 'straw man' argument, as many residue studies do include limited discussion of individual artefacts, albeit usually in the context of taking a tool which exhibits exemplary residues as indicative of a broader classification the



analyst has identified. My aim is instead to make explicit some of the underlying issues which render the grouping of singular residue results problematic, and offer a complementary alternative framework.

■ SCALE, NARRATIVE, ACTION AND AGENCY

In exploring additional avenues for the interpretation and communication of residue findings, aspects of social theory including concepts of narrative and agency reward consideration. In particular, the concept of individual action as an underlying and essential component of agency theories requires investigation, leading in turn to the various and often conflicting scales of interpretation used in reconstructing the past. Incorporation of residue studies into larger archaeological projects, and communication of residue findings to non-archaeological communities, can benefit from explicit consideration of the theoretical appropriateness of asking broad-scale questions of micro-scale techniques. To complement this direction, narrative is posited as a useful approach in increasing the value of the specific information stone-tool residue studies provide.

From the outset it should be recognized that many of the terms used in this article have had a multitude of meanings attached to them by archaeologists, sociologists, historians, philosophers and others in the social sciences and beyond. For the purposes of avoiding at least some confusion, therefore, a person's *agency* is here defined as involving intentional actions, performed by an agent who had at least some capacity to act otherwise. The agency of non-human objects (e.g. Gosden, 2005), while a valuable concept in certain circumstances, is only tangentially relevant to the current discussion and will be considered in future work. At the basis of agency, *actions* are seen here as the physical acts performed by a person, whether or not they are reflexively recognized by the actor. In the sense that actions can be performed without intentional choice, action does not therefore automatically imply agency (Joyce, 2004). This distinction is necessary as we cannot make assessments of the social agency of others except through their actions (Gell, 1998), and in the case of archaeology we are restricted even further to observing those actions which have left a material trace. In terms of residue studies, therefore, it is the results of actions that are observed and interpreted.

Finally, the term *narrative* is recognized here as an integral component of archaeological communication, not just in written, scholarly texts, but also in oral presentations or accounts, in museum displays, and in visual formats such as film. This integrity does not derive from any special relationship archaeology has with narrative, but because narration is itself an inextricable part of human social communication and perspective in most contexts. Additionally, archaeological narrative is here accepted as

analogous with ‘storytelling’ (Joyce, 2002: 4; Praetzelis and Praetzelis, 1998), albeit ‘constrained by what once was’ (Ricoeur, 1984). The central concern of this article is not the critique of this notion, but an examination of the creation, articulation and role of specific components of those stories. Each of the terms defined here are explored further below.

Scale

In considering differing scales of archaeological analysis and interpretation, the work of the *Annales* historiographers, and in particular Fernand Braudel’s tripartite division of history into *l’histoire événementielle*, *conjoncture*, and the *longue durée* (Braudel, 1972), has provided a useful focus. Although these are artificial divisions selected by Braudel from what is essentially a continuum, they have gained some currency in both history and, more recently, archaeology (e.g. Cobb, 1991; Smith, 1992; Staniforth, 2003). Their real value is as an heuristic device, by offering one means of differentially weighting datasets dependent upon the scalar framework of a specific project (Bailey, 1983). Related concerns, particularly with the necessity of comparing archaeological data and models at the same analytical scale, have also been expressed without explicit reference to *Annales* writings (e.g. Lourandos, 1996).

Microscopic analyses of the surface of a single stone artefact are undertaken at a micro-scale under any archaeological definition. From this perspective, individual people are themselves ‘micro’ compared to typical archaeological concerns with the *conjonctures* of social groups or an expanded *longue durée* of millennia. Both temporally and physically the actions recorded on a tool are typically of shorter duration even than ‘events’ as defined by, for example, Brooks (1982) or Staniforth (1997). Here, the contingent and historical nature of every specific moment plays a paramount role. Resins, starch grains or a protein film may be observed which represent the result of less than one second’s contact between the tool surface and a piece of bone, hide, or wood, and yet which potentially contain a great deal of information, including in many instances the exact species of plant or animal involved.

For some tools this fleeting contact will be their only use, however on many tools there will be an accumulation of residues through the artefact’s use-life, the result of which is a palimpsest of specific actions. In these circumstances the scale represented by the residues approaches more closely the concept of the ‘event’ as a collection of closely spatio-temporally related occurrences. The palimpsest event thus represented should not necessarily be seen as representing a cumulative ‘typical’ use of the artefact, however. It is here that the concept of ‘the instant’ is useful, not as a means of suggesting that residue studies have a monopoly on, or privileged insight into, extremely short-term occurrences (consider the time taken for a stone



flake to detach from a core, for instance), but as a means of forcing conscious deliberation on the individual actions behind even cumulative material remains. At the same time, the closeness of examination employed in microscopic analysis may provide an uncommon opportunity for archaeologists to recognize such actions. It should be noted that the means of differentiating component actions within a residue palimpsest will differ between microscopic and chemical residue studies, and it is the visual discrimination of microscopy that is emphasized here.

As well as enabling recognition of specific actions, the fine-scale resolution of residue studies does present the danger of losing touch with an artefact's wider archaeological context. Without the examination of hundreds or thousands of artefacts from a single site, representing a significant proportion of the recovered assemblage, microscopic-residue analysts have yet to show how the fine-scale information obtained from residues can be defensibly incorporated into reconstructions of artefact use over spatial and temporal distances. To enable such incorporation, any extrapolation from small numbers of analysed artefacts would most likely have to tie artefact use back to artefact form, a procedure which has been shown by many residue analysis and lithic reduction studies to be unreliable (e.g. Fullagar, 1988; Hiscock and Attenbrow, 2005; Loy, 1994; Perry, 2004; Shafer and Holloway, 1979). The interpretive frameworks required for maintaining the specificity of residue results in conjunction with other datasets from a site are as yet underdeveloped. Provided residue analysis continues to be employed, there will eventually develop a significant body of results to which larger questions of resource exploitation and changing social and ecological involvement of stone tools can be put. Until such time, however, the results of even the limited studies currently carried out can be better used if applied at the appropriate scale.

Of theoretical concern is the gap – a specific target of middle-range theory – between static material objects and observations on the one hand and the syntheses of cultural regions or periods necessary to a broad-scale understanding of the past. Using certain kinds of evidence (including, I would argue, limited-sample residue studies), this gap may be unbridgeable, and in these situations it is undesirable to attempt the crossing. As one alternative, the observed actions could be considered as separate ungeneralized but informative occurrences, irrespective of their representativeness of a class of actions. The reconstruction of broader social aspects of stone-tool use are achievable and important; micro-scale residue analyses which do not examine significant proportions of an assemblage simply may not provide relevant data for the larger questions, and an acceptance of the 'multi-temporality' (Lucas, 2005) of the phenomena encountered in the archaeological record leads to the realization that it is not essential that they do so.

The issue of relating specific observations to generalized conclusions was addressed by Rowlands (1982: 160), who noted:

If specificity is lost altogether, any generalisation becomes so general as to be useless, and if too much specificity is retained, then establishing its meaning by relating it to events or cases of a similar class becomes impossible. The problem for many archaeologists is knowing what class of general propositions they might contribute to.

Rowlands went on to highlight the archaeological concern with processes of change as one solution to this problem (see also Drennan, 2000). Residue analyses are uniquely positioned to examine change in artefact use, however sample size and taphonomy limit residue interpretation even in this basic regard. For example, Barton and White (1993; see also Barton, 1990) discuss possible changes in 14,000 years of activity at Balof 2 rockshelter, New Ireland, in terms of the residue results from 21 stone and 21 shell artefacts. The plant residues seen on the six obsidian artefacts in this sample are used to suggest that tuber processing was consistently carried out with this material, and that therefore the ethnographic record in the area of obsidian use on humans and animals may be flawed (Barton, 1990; Barton and White, 1993: 178). The description of up to 10,000 years of activity from six artefacts (average maximum length 7.5mm, combined weight <1.5g) would instead, I suggest, present these flakes as an inadequate sample for making such sweeping statements. A theoretical approach which emphasized individual action over broad homogenizing statements would instead have enabled discussion of each artefact at a scale commensurate with that of the analysis. In turn, employing the appropriate interpretive scale potentially allows the micro-scale activities of the individuals using the artefacts to be presented in a more engaging manner, as discussed further below.

There is a tendency in archaeology (and other disciplines) to consider new practices or theoretical approaches in terms of the ability of the approach to be applied widely across the discipline (noted, for example, by Bell, 1992: 46; and explicitly argued for by Peregrine, 2004: 303). Instead, stone-artefact residue studies need to be introduced to those areas where they can contribute substantially to the research questions being asked. If communication of archaeological results with non-specialists is desired, then the specifics and human-scale actions revealed through residues are relevant and a considerable asset. If the explication of a ten-thousand-year occupation of a rockshelter site is the goal, residue studies can play a part in telling the story, but are most useful in adding separate detail to specific components of that story.

Action and agency

The attention given to the concept of agency in recent social archaeological research is due in part to its mutability, serving to focus disparate areas of archaeological theorizing on the necessity of adequately peopling



reconstructions of the human past. A good summary of the varying idioms associated with the term and the variety of archaeological applications currently being explored, along with a concise introduction to the concept, can be found in Dobres and Robb (2000a, 2005; see also Joyce and Lopiparo, 2005). Standard reference points in archaeological circles have been Giddens' (1979, 1984) idea of structuration, and Bourdieu's (1977) theory of practice. The 'ambiguous, often incomprehensible but incontrovertibly high-brow writings' (Dobres and Robb, 2000b: 3) of these and other sociological authors do not need to be rehearsed for the purposes of this essay, nor for the integration of residue studies into broader archaeological concerns. Instead, the aim is to concentrate on the interpretation of past actions, and only tangentially on past 'agency' (however defined). As noted earlier, action is in fact essential to notions of agency, and investigations of past actions offer one avenue for avoiding indiscriminate and unfounded applications of agency in archaeological reconstructions. If archaeological agency is to be more than a platitude, examination of the actions of past individuals is crucial.

A key point to be made with regard to the archaeological application of agency and action-centred views is that the most plausible reconstructions have tended to derive from areas possessing written records, or exceptional preservation of materials (Burke et al., 1994: 15; Johnson, 1989; Meskell, 1998). As Wobst (2000: 43) notes, 'there seems to be a notion that the more the human mind is implicated in the data ... the more difficult the theorizing and the more one is dependent on the spoken or at least the written work'. While attempts have been made to investigate individuals and agency in non-literate societies through stone artefact studies (e.g. Kay, 1977), the majority of studies involve either historical societies or derive information from objects bearing clear artistic/stylistic representations. This is not to denigrate those studies which do have exceptional evidence; the use of extra-artefactual evidence such as ethnography plays an important part in residue studies (see case study below). Rather, stone-tool residue analysis offers an alternative technique, which, with an appropriate research focus, can bring the benefits of agency theories much more readily into hunter-gatherer, non-literate, and non-elite contexts.

Narrative

If stone-tool residue studies are currently unable to address meaningfully questions of subsistence other than presence/absence of particular plants or animals, particularly at scales beyond the individual event, how then can they best be employed? A focus on micro-scale actions provides the raw data, but further contextual frameworks are necessary to begin to realize the full potential of this data. As one response to this need, the framework offered here is that of narrative. As with agency theories, the notion of

narrative as an explicitly addressed concept is enjoying increasing popularity amongst archaeologists (Ballard, 2003; Gero, 1991; Joyce, 2002; Pluciennik, 1999). The position taken in this article is that narrative represents a fundamental mode of human social expression (cf. Somers, 1994; White, 1984), and that residue studies play a vital role in anchoring and adding depth to archaeological narratives. I follow Gould (1999: xi) in recognizing that ‘the mentality of *Homo sapiens* seems to favour the story-telling mode, so we should not eschew such a natural inclination’. The apparent universality of narration is an especially important point to consider when archaeological narratives are taken outside of the academy, and used to engage the wider public either directly (e.g. through television, film, museums) or indirectly (e.g. as components of requests for taxpayer funding of archaeological projects).

Psychologically, narratives can be seen as networks, consisting of nodes of story elements connected by explanatory and relational devices (cf. Van den Broek, 2001) as well as a temporal structure. If the goal of a narrative is to be memorable (a goal which then enhances any further aims such as influencing the audience or ensuring repetition and thus longevity of the narrative), then the extent to which the nodes and their connections are personally resonant with the audience is a crucial factor in the construction of any narrative. Archaeologically, the goal of memorableness would typically seem to be secondary; instead the construction of a narrative that reflects past circumstances as plausibly and reliably as possible usually assumes primacy. These two aims are not mutually exclusive, however, and they can be combined in communicating both theoretical and practical conclusions. Residue analysis offers one means to combine reliability and memorableness through the touchstone of tangible, used artefacts and their incorporation into broader narratives drawn from other archaeological analyses.

As Brumfiel (2000: 251) notes, ‘Beyond explaining social change, agent-centred analyses can add texture to descriptive narratives of the past’. Action- and agency-based approaches force us to consider the archaeological record as a palimpsest not just of (for example) different stages in a society’s history, or of use and reuse of a site by mobile groups, but as a record consisting entirely of the actions of individuals, constructed one discarded artefact at a time. Without turning to extreme methodological individualism (Gillespie, 2001) or historical particularism – both of which can ignore the influence of social and environmental constraints on actions – it is precisely the texture, or personal detail, available from a consideration of personal action which can give narratives their resonance. Details are in fact essential to the historical quality of narrative. Whether or not a particular action influenced or changed contemporary social structures, or even the agent undertaking that action, to any great degree is not the central concern of the proposed benefits offered by micro-scale stone-tool



residue analysis; instead the key is a connection felt by present people with those of past societies, and the grounding provided by the details to larger narratives. As Balme (1996: 50) puts it:

For most non archaeologists, archaeology is interesting because it is about their own past. So it is the details which allow people to better imagine themselves in past societies which makes particular archaeological stories attractive and our appeal to the public depends on our ability to bring the past to life by providing these details.

Applying this line of thought to displayed artefacts in a museum, for example, residue analysis offers an opportunity to change public perceptions of essentially static objects through association of those objects with specific, lived actions, regardless of the anonymity of the person who performed those actions.

The role for residue studies in archaeological narratives is therefore twofold. First, these analyses provide an opportunity to 'observe the details of practice' (Hegmon, 2003: 221), which add a personal edge to descriptions and explanations of site use employing timescales longer than the instant or event. The value of incorporating the actions revealed by residues (whether as memorable textural details or as specifics in a large-scale narrative) exists regardless of the importance of the artefacts analysed, or even the novelty or wider applicability of the results. Second, residue findings can act as essential components of currently developing archaeological approaches, which concern themselves with describing life-histories and discovering the contingency-dependent actions of past people. The agent- and practice-centred narratives gaining acceptance within archaeology, which may typically incorporate both of these posited roles, therefore have much to gain through greater involvement with residue analysis (and vice versa).

■ INTEGRATING RESIDUE ANALYSIS

The ideas discussed here represent an initial exploratory foray into the greater communion of residue analysis and social archaeological theory. In this light, it is useful to examine a case study which begins to explore these ideas in a more concrete fashion, and to illustrate the manner in which such integration may take place. Further research is currently in progress which will extend these concepts.

The case study is drawn from a residue and use-wear study of 150 stone artefacts from the Late Preclassic period of the ancient Maya city of Copan, in western Honduras (Haslam, 2003). The analysis was undertaken to investigate the function of one shallow pit feature, dug into the sterile

alluvial clays of the Bosque ward (west of what is now the Copan Principal Group) approximately 2000 years ago (Hall and Viel, 2004). The pit was hypothesized as a simple dump for unused lithic waste material (Hall and Viel, 1998); however, the artefacts and their residues revealed a more complex depositional history. Subsequent analyses of the ceramic and associated materials found within and close to the pit have resulted in even greater resolution of the formation of the feature, including both ritual and mundane elements (Cummins and Haslam, 2006).

A number of plant (cellulose, starch) and possible animal (shell, collagen) residues were observed on the obsidian and chert flakes which make up the assemblage. The artefacts were largely expedient and unretouched. A typical approach to the residue data from the pit as a whole might be to contrast the proportions of floral and faunal residues (effectively assuming that such groupings are meaningful), and present a discussion of the subsistence or craft-related activities at the site based on these numbers. Alternatively, emphasis could be placed on the unexpected use of obsidian flakes for maize processing (Haslam, 2003), following the procedure of testing established expectations of use based on tool form/material. As noted, both these avenues have become popular among residue analysts as they provide a base for normalizing generalizations at a site. If these generalizations fail because of a lack of consideration of scale and small sample sizes, however, what then can be done with the data? The question may justifiably be asked whether, for example, any Honduran living in the modern nearby town of Copan Ruinas, any tourist wandering through the site on their annual vacation, or even any archaeologist (concerned or not with Mesoamerican lithic analysis), would gain anything from a separate consideration of the residue findings for each artefact.

Such questions implicitly stress the need for wide applicability of archaeological results to avoid a descent into overwhelming, insignificant detail. To adapt a common analogy, if we look too closely at a single leaf, we will have difficulty comprehending the tree, let alone the forest we are standing in. The line of reasoning presented here, however, is that 'big-picture' discussions may be just as abstract as fine details, and ultimately it is the resonance of any findings to the audience, archaeological or otherwise, which determines the acceptance of an idea. The popularity of what has been termed 'alternative' or pseudo-archaeology strongly attests to this (Hiscock, 1996). Intelligible narratives placing specific past actions into narrative frameworks allow an attempt at resonance without requiring possibly inaccurate extrapolation of singular results.

Putting aside most of the Copan residue data, the salient material for the present study is therefore the finding of residues consistent with the processing of fresh maize (*Zea mays*) using two obsidian flakes. Maize epidermal tissue, starch grains and a binding liquid residue were discovered, presenting a residue suite consistent with that shown by experimental



processing of fresh maize kernels. A distinct association between the different residue types and a lack of overlying use-wear or residues precludes the accumulation of these residues as a palimpsest, and attests to their rapid deposition on the tool. By combining this finding with information on the maize growing season in the Copan region, and ethnographic and archaeological evidence of subsistence activities related to maize (e.g. Wisdom, 1940) it is possible to present the use of the flakes within the temporal context of the few months each year that fresh corn was available to the ancient Copan inhabitants.

The common practice in the region is to leave maize cobs attached to the stalk to dry slowly in the field (or *milpa*) at the end of the growing season, resulting in dried kernels which last longer in storage. This technique can be observed in the Copan area today, and was essentially the same around AD 600 at the Ceren site in El Salvador, as revealed by plaster casts of maize plants made from hollows in the volcanic ash which buried the site at that time (McKee, 2002: 68). What this practice means for the residues is that the processed maize plants had matured and were ready for consumption, but were not in the dried storage form, an occurrence expected in July and August (the unharvested maize from Ceren helped narrow the month of the eruption there to August; Sheets, 2002: 199).

Considered within an action/narrative context, the maize residues therefore present a picture of an anonymous villager in the Copan Valley. On a July or August day some 2000 years ago, they used a nondescript but very sharp piece of volcanic glass to slice into a maize cob fresh from the *milpa*, leaving the starchy juice running across their hands and the tool itself. It was the rainy season, and the Copan River may have been taking one of a number of paths through sometimes ephemeral channels in the valley, compared to the more regulated channel maintained by the later Maya (Hall and Viel, 2004). The fertile alluvial bottomlands are likely therefore to have been quite muddy on the journey from the household to the *milpa* and back, but a lack of abrasion wear on the obsidian suggests this mud did not find its way onto the artefact during transport, storage or use. It is also possible the maize was one of a select group of plants growing in a nearby infield or kitchen garden rather than the more distant outfields, cultivated along with plants such as squash, beans, chile, and possibly root crops and agave (Lentz, 1991; Wisdom, 1940). With heavy dependence on maize as a dietary component at Copan (Webster et al., 2000), and its pivotal role in Mesoamerican ceremonial life, it is not difficult to imagine the excitement in the village surrounding the annual period of fresh maize availability as a backdrop to these actions.

Obsidian in Late Preclassic Copan was almost exclusively obtained from the Ixtepeque source, located 80km in a straight line southwest of Copan. Aoyama (1999: 19) observes that it was possible for Copan villagers to make a round trip to Ixtepeque within a week, including time for

quarrying at the source. At the time the villager sliced into the juicy corn cob, obsidian was being imported into Copan mainly as unmodified small nodules or larger flake spalls, where it was then reduced through percussion to expedient flakes. This occurred at the household level (Aoyama, 1999), and it is possible that the user of the obsidian created her/his own tools in this manner. Much of the discarded obsidian surrounding and within the Bosque pit feature retained (and to this day still retains) exceedingly sharp edges, suggesting that discard was not due to edge-dulling, and consequently that obsidian was likely not valuable enough to curate to the point of uselessness. The specific circumstances surrounding the discard of each of the artefacts considered here are unknown, however the combination of ritual marking of the surface into which the pit feature was dug (Cummins and Haslam, 2006) and evidence of mundane domestic refuse in the pit infill (Haslam, 1999, 2006) suggests a complex discard environment. In the end, and given the lack of palimpsest residue accumulation, it could simply be that, having been used, the artefacts were no longer required and were sensibly discarded as hazardous materials, a common practice of both modern (Clark, 1991) and ancient (McKee, 2002) Maya. Additional residue analyses currently underway on material from Preclassic Copan may shed some light on this matter, but if they do so, it will be from the perspective of a different tool, used for different purposes within the same social context.

Two nondescript artefacts, and their residues, have led to the narrative presented here. The narrative may be attributed to any one of the tools without becoming proscriptive, as there is plenty of room for variations on this theme. In any case, the scenario arrived at is very different to one of changing utilization of plant/animal species through chronological or geographical distances, or of broad functional typologies tested against residue data. In creating this narrative, I have benefited from previous studies conducted at Copan and other sites, however there is nothing particularly special about the kinds of contextual information I have drawn on. Similarly, while ethnography does play a role in this case study, there is no reason why this approach cannot be used to investigate societies for which no such information is available, provided the archaeological context is appropriately referenced. Studies by Owen (2000) and Soffer (2004), who have employed use-wear studies of Palaeolithic artefacts to discern gendered activities, offer comparable examples of this kind of specific knowledge.

Moving on from the case study, then, it is informative to consider the degree to which the scale of action recorded through residue studies is one which is resonant not just with people today, but perhaps with those in the past as well (cf. Arnold, 2001: 221–2; Lucas, 2005). There can be little doubt that the actions routinely inferred through residue analyses were recognizable to, and had at least the potential for conscious creation by, past



individuals. This dual resonance, in past and present consciousness, could be enhanced by an explicit search by residue analysts for those actions which offer some evidence for conscious choice on the part of the person using the artefact. Just what constitutes such a 'choice' is in no way clear cut, and the result runs a risk of being an imposition of the archaeologist's perspective on past actions; however, it is a certainty that such evidence will not be found unless analysts are themselves consciously looking for it. Of course, this does not preclude the observation of expected or routine actions also providing information about a tool-user's societal roles. In this way we can approach the past from an angle which at least attempts to access an agent's view of their own world (Carr, 2001), even though our own perspective is always inherent to some degree in the reconstruction of that view.

As a final incentive, there are also clear benefits in employing action-based techniques such as residue analysis to make the most of the billions of stone artefacts currently already excavated and sitting in collections around the world. Apart from the obvious ability to maximize archaeological knowledge in this way, some funding bodies (e.g. the Foundation for the Advancement of Mesoamerican Studies, Inc.) currently actively encourage projects which work with previously excavated materials (FAMSI, 2006: 3). This focus also ties in with calls for archaeologists to work with existing artefact collections as justification for continued funding of museums (Lambrick, 2002). In many cases, it would be possible for residue analysts and the groups with whom they work to re-evaluate previous residue studies in terms of practice/action-based narratives. An even stronger connection can be made, however, by foregrounding the considerations discussed above from the design stage of residue projects. In all cases it is important to use any findings from other analyses at the same site, and relevant ethnographic information, to determine the most effective questions to ask of the functional analysis.

■ AN ARCHAEOLOGY OF THE INSTANT?

While the explicit use of single-artefact residue data as a means of accessing and communicating individual action as an end in itself is a relatively new approach, the concept behind it is not. In 1980, Cahen and Keeley discussed the evidence for their inference that a portion of the Epipalaeolithic Meer II site in Belgium represented the very short-term activity of two or three people making and using stone tools (Cahen and Keeley, 1980). They conclude their article with an epilogue 'bedtime story for archaeologists' – essentially a narrativization of the day 9000 years ago that the observed activities took place. In presenting it as a bedtime story (and

divorcing it somewhat from the rest of the article as an epilogue), Cahen and Keeley downplay the role of the narrative in relation to the rest of their article, yet in many ways the story presents the clearest communication of their findings. Their observation that much of the social sciences is built on the recording of the actions of individuals led them to conclude that ‘in this sense, descriptions of individual behaviour are not anecdotal but fundamental’ (Cahen and Keeley, 1980: 166).

Derek Roe’s introduction to the same 1980 *World Archaeology* volume (quoted at the beginning of this article) neatly encapsulates the possibilities and sense of connection with actors in the past provided by specific knowledge of past actions. We are brought ‘face to face’ (Roe, 1980: 107) with individuals long dead because the detail available to us is clear enough to fire our imaginations, in a way that generalized, macro-scale discussions about, for example, ‘the rise of complex society’ or ‘optimal foraging behaviour’ simply cannot. This ties in with more recent calls such as that of Hodder (2003: 84), ‘that there is a need to shift from agency . . . to individual narratives of lived lives and events’. Kantner (2003: 2) has observed that ‘what interests the public are stories, both about the past and about archaeology as a discipline – they want to see it, feel it, imagine it’ (see also Bower, 1995: 36–7; Deetz, 1998). Through combining these precisely captured instants with the benefits of utilizing them in the ongoing creation of archaeological narratives, we can end up with just those kinds of stories that invigorate archaeologists and the public alike.

Would a move by residue analysis (an archaeological science approach) towards social narratives as a way of telling the past mean that these reconstructions would be less valid than at present? It is certainly nothing new to suggest that there are different potential pasts which may be created by present (and future) archaeologists (e.g. McGlade, 1999), although academic standards stipulate that the justification for presenting any one ‘past’ should be clearly spelt out, and thereby opened for debate. It is perhaps a mark of archaeological science that the methods employed and the often very specific knowledge encountered (through isotopic, microscopic or genetic analyses, for example) produce a tendency for archaeological scientists working with this data to expect some degree of correlation between their observations and ‘what actually, definitely happened’ at a given time period. It is in the very essence of the scientific method to generate a trend which moves ever closer to (Western scientific) ‘reality’, even if such an end is ultimately unreachable. Meanwhile, the same expectation may be less rigidly necessary for a broader social anthropological investigation of the same time period, since the greater implication of human intentionality and interaction in the data opens the door for descriptions of the past that contain elements which may be observable solely from the privilege of the present. In other words, there is greater potential for the discussion of aspects of ‘the past’ that have not existed



until right now, called into being by the present-day researcher in a literary parallel to Schroedinger's cat. While this contrast may have deterred scientists working on archaeological problems from extending their narratives, it is by no means an impermeable barrier, and residue analysis is well placed to act as a test-bed for the greater integration of social and scientific pasts.

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