

Excavation and Recording of Lithic Scatters

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Produced by the La Manche Prehistoric (LaMP) research group

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Overview

Lithic artefacts form an important component of prehistoric archaeology, they are highly durable and informative behavioural elements of the archaeological record and can be found in a wide range of geological/sedimentary and surface contexts from the Pleistocene and Early Holocene time periods. Therefore they provide a widespread record of human behaviour through much of human prehistory, often providing the only behavioural record of past human cultures and extinct human species. While accepted national guidance exists for the management and investigation of surface lithic scatters such as might be encountered in ploughsoil (English Heritage 2000), and standard assessment methodologies for deep Palaeolithic potential within fluvial gravels have generally been adopted regionally, there is currently no nationally accepted guidance for the assessment, investigation and recording of lithic artefacts across all sedimentary contexts.

While in south east England the majority of lithic artefacts are manufactured on flint, other raw materials are found (eg. chert, quartzite). Lithic artefacts consist predominately of flakes produced during the production of tools (debitage), the blocks from which they were removed (cores, tool roughouts), formaldebitage like blades and bladelets, tools and utilised pieces as well as other items such as hammer-stones and anvils/querns.

Assessing the importance of even a single artefact requires careful consideration of age, context and condition; technological or typological features alone are not adequate factors when considered in isolation. Interpreting the significance of lithic artefact scatters, from diffuse spreads of material to large or dense accumulations, requires very close attention to palaeolandscape situation, sedimentary context and the application of detailed post-excavation analysis. Consequently the prime consideration in the field should be on how best to record both the position and sedimentary context of lithic artefacts encountered at an appropriate level for their possible significance.

While overall interpretation of lithic material can only be made after excavation, careful assessment and evaluation of depositional context can go a long way in determining the likely parameters of the material in terms of age, degree of preservation and importance at local, regional and national scales.

Therefore, where a site with abundant or potentially important lithic artefacts is anticipated or encountered, it is important that specialisms in lithic technology, taphonomy and geoarchaeology should be included as part of the on-the-ground project team to develop and implement a mitigation. These specialisms should be ideally deployed on-site permanently or at the very least on a regular, daily basis to develop and oversee an appropriate recording strategy. Additional expertise from an environmental archaeologist will also be necessary to guide sampling.

Site Assessment/Evaluation

The possibility of sedimentary or surface contexts containing prehistoric lithic artefacts should be considered at the outset of any project, both in relation to the development of an Environmental Impact Assessment and in the formulation of an initial field evaluation strategy. Each stage of assessment and mitigation should be formulated with reference to key strategic aims (themselves informed by appropriate regional and national research frameworks) and explicit methodological objectives (designed to progressively characterise the archaeological significance of the site).

The site should be considered first in geoarchaeological terms as comprising a series of sedimentary contexts which derive from successive palaeolandscapes. Each sedimentary context should be considered in terms of their likely age and significance, their potential to preserve lithic artefacts and the nature of the proposed development impact upon them. Consideration should be given to the likelihood of lithic material being found in primary context (i.e. within a sedimentary context of the same age as their manufacture, use and discard), in secondary context (reworked or derived by sedimentary processes subsequent to their manufacture, use and discard) and the degree to which the agents of sedimentary deposition may have altered, sorted or disturbed the original arrangement of lithic artefacts (resolution).

Seven types of geomorphological context are considered as useful to consider here (Table 1): Surface, Feature, Slope, Valley bottom, Coastal Platform, Plateau Surface and Karstic. The presence, occurrence and inter-relationship of each needs to be determined across the site, in addition to the likely age range and the resolution of the archaeology preserved within them. Archaeological resolution is used here as a term to describe the degree to which the site may preserve a detailed record of past human behaviour and consequently requiring an appropriately detailed recording methodology. Each sedimentary type is listed in the table below.

Geomorphological Context	Sediment type	Sediment type	Age of Deposits as Encountered in SE England	Archaeological Resolution
Surface		Ploughsoil, Topsoil, Made Ground	Holocene	Medium -Low
Feature		Ditch, Pit, Post Hole etc.	Holocene – Late Pleistocene	High - Low
Slope	Head/Colluvium	Colluvium, Gellifluction Deposits, Brickearth.	Holocene – Middle Pleistocene	High - Low
Valley bottom	Fluvial and lacustrine	Coarse (sands and gravels), Fine (silts and clays).	Holocene – Early Pleistocene	High - Low
Coastal platform	Shallow marine	Coarse (sands and gravels), Fine (silts and clays).	Holocene – Middle Pleistocene	High - Low
Plateau surface and edges	Aeolian	Coversands, Loess	Holocene – Middle Pleistocene	High- Medium
Karstic	Caves, dolines and rockshelters	Cave sediments, fills of solution and structural features, tufa and travertine.	Holocene – Early Pleistocene	High - Low

Table 1: Anticipated Archaeological Resolution by Sediment Type

Assessment of a site should aim to sample all sedimentary contexts which have been determined to be present within the development area. They should be sampled to at least the depth of development. Impact should be considered in terms of not only physical destruction of sediments and material/features within them but also in terms of the effects of geochemical modification and dewatering. In order to understand geoarchaeological contexts correctly it will be necessary to investigate to the base of the Quaternary sequence in some parts of the site or beyond the limits of the development area.

Standard evaluation trenches will rarely be adequate in isolation to achieve a full assessment of potential unless it can be conclusively proven that shallow surface deposits overlie only pre-Quaternary geology across the whole site. More commonly geoarchaeological trial pits and/or long sections, stepped trenches (*Sondage Profond*) will be needed to determine if deeper sedimentary contexts underlie the site with potential to preserve lithic artefacts and associated archaeological material/features. The scale and scope of these geoarchaeological interventions will be determined through discussions between geoarchaeologist and lithic specialists. These interventions should be placed at intervals adequate to investigate the full range and relationship of sedimentary contexts underlying the site and they should purposively sample for the presence of lithic artefacts e.g, through sieving for artefacts (including microdebitage) or through hand excavation of sediments considered to have potential for high resolution archaeological signatures.

An assessment report should describe any lithic artefacts recovered specifically in terms of sedimentary context, sedimentary history, age, and resolution in addition to statements about raw material, technology and typology. The assessment report should contain a self critical assessment of the limitations of the study and the impact these limitations may have had on the interpretation of the archaeological material and sedimentary context.

Dealing with High Resolution Signatures: Suspected Primary Context/*In Situ* Lithic Scatters

Whether lithic artefacts are preserved in primary context, or indeed *in situ*, can often only be fully determined after post-excavation analysis. Consequently where lithic artefacts with the potential for a high-resolution archaeological signature are encountered, a record should be made which allows for this analysis and preserves the maximum information regarding their position and context.

Potential high-resolution signatures need to be defined spatially in three dimensions to determine the limits of the scatter within the area of investigation. Sites should be gridded to at least 1m resolution.

All lithic artefacts over an agreed size should be recorded three dimensionally by survey using a total station or GPS. This agreed size might be as small as 5mm Maximum Linear Dimension (MLD) for a site where microlith manufacture is prevalent, or as high as 30mm for a Neolithic axe production site. Generally 10mm or 20mm are appropriate for X,Y,Z recording. All lithic artefacts recorded in this manner will be individually bagged and recorded as small finds. Tools/tool fragments less than the agreed MLD can also be recorded in this manner as considered appropriate, for example where microlith fragments or micro-burins are identified.

Where lithic artefacts have a definite long axis (defined by maximum length of the artefact being at least twice that of the maximum width), the orientation of the artefacts long axis to north should be recorded. The proximal end of the artefacts should be taken to indicate the direction of orientation. An artefact with a proximal end pointing to the north east would have an orientation of 45 degrees. An artefact with a proximal end pointing to the south west would have an orientation of 225 degrees.

Where a lithic artefact is not resting flat on or within a sediment body, the degree to which it dips should be measured with an inclinometer. An artefact encountered on its edge within a sediment body would have a dip of 90 degrees.

Unless encountered directly on end or on edge the surface of the artefacts which faced uppermost at discovery (ventral or dorsal) should be recorded.

Non-tool fragments of less than the agreed MLD (which can be referred to as small debitage) should be bagged according to an appropriate spatial recording system consistent with context. With potentially high resolution sites this should be no coarser than to within a spatially defined spit within a 1m site grid square. Each 1m site grid square can be subdivided in 4 0.25m squares where extremely fine grained patterning is apparent or suspected.

Dealing with Medium-Low Resolution Signatures: Lithic Artefacts Suspected as being Disturbed or within a Secondary Context

If after initial assessment by a geoarchaeologist and lithic specialist it is considered highly likely that the lithic artefacts encountered are preserved within a secondary context or otherwise disturbed, the necessity to undertake three dimensional recording can reasonably be dispensed with in some but not all cases. The level of recording should be informed by the research aims.

Scatters, where disturbed or distributed by slope or fluvial processes within a sediment body are unlikely to yield high resolution archaeological signatures, but should still be recorded to the nearest metre square or discrete context (e.g. feature fill) at least. Consequently any area excavation where lithics are found within the sediment body under excavation should be gridded, generally to at least 1m square resolution. A decision can then be made whether to investigate the sediment body in its entirety or to excavate a sample of 1m squares (e.g. as an alternate, chequer board arrangement).

Excavation of sediment bodies containing lithic artefacts in suspected secondary context should be excavated in spits of appropriate but consistent depths dependent on the intensity of lithic material. Spits will generally be in the order of 0.05-0.1m but may reduce in thickness under exceptional circumstances. It is important to survey in the height of each new spit within each metre square as a check on possible errors or inconsistencies. A sediment description should be made of each spit, and spits should end at the contact with the underlying sedimentary context.

A decision should be made on the size cut off for collection. For example a policy of total collection of all identifiable lithic artefacts could be made, but it might be considered practical to collect only those over 10mm and to take samples of sediment for bulk sieving to achieve a representation sample of smaller debitage.

Every attempt should be made to keep excavation and collection/sampling methodologies consistent across the site and during the excavation process. If methodology is changed during the course of an excavation the implications for consistent assessment of the site should be carefully considered and an explicit record of the reason and the nature of the change in methodology made.

Flints can work their way down a soil profile to a considerable degree and can in areas of peat formation be dragged upwards into the peat. Such flints still belong to a scatter even if they now occur in three or more geoarchaeological contexts.

Sediment Sampling

The level of sampling will be dependent on the nature of the sediment body and the character of the lithic artefact scatters encountered. This will vary between no or very perfunctory sampling where lithic artefacts are encountered in a surface deposit through to 100% sampling by grid square/spit for the densest self-contained scatters or within features. Bulk samples may be taken primarily for artefact recovery and these will not be put through flotation. But secondary samples from each context should also be retained for full flotation. The level of such sampling will be determined in the field dependent on the quality of preserved environmental remains. Soil Micromorphology samples should be taken through the sedimentary sequence and across sedimentary boundaries.

Dating Considerations

Dating of lithic artefact scatters can be problematic but every effort should be made to obtain datable material from each sedimentary context preserving lithic artefacts or to date the sediment body itself.

Specialist advice will be sought for applicable dating methods. Arrangements will be made for dating specialists to visit the site to and assess the potential for dating techniques through consultation with the geoarchaeologist and other relevant specialists.

Dates should be obtained for sediment bodies preserving lithic artefacts. Silts and sand deposits associated with a flint scatter may be suitable for OSL. Sampling of organic sediments or soil horizons (e.g. peat) associated with lithic artefact scatters may also yield radiocarbon dates. For Early or Middle Pleistocene contexts palaeo-magnetic dating techniques might be considered.

Dates may be directly obtained for burnt lithic artefacts through Thermoluminescence or associated organic ecofacts or artefacts might be directly dated by radiocarbon techniques.

Feedback/Comments are gratefully received, please email m.pope@ucl.ac.uk