

The lithic assemblage of Birch Quarry: its metadata and a commentary on its application.

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¹ (Lower Palaeolithic hand axe from Birch Quarry, personal collection, 2023)

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Construct a database or dataset of selected archaeological material / records, provide metadata statements in line with current Archaeology Data Service guidance, and a commentary explaining and justifying its structure and the categorisation / classification of the data.

Introduction

During August 2023, an evaluation took place at land south of Maldon Road near Layer Marney, Essex (Hicks, 2023). CAT and the client have a long-standing agreement as the continual expansion of quarry works means land routinely needs to be approached archaeologically to permit further work. The area around Birch Quarry has produced significant archaeology in the past and this investigation was no different. This evaluation of 71 trial-trenches uncovered a range of archaeology including an assemblage of lithics dating from the Lower Palaeolithic to Bronze Age (Lawrence and Wightman, 2023, p. 22). These lithics were categorised, and subsequently analysed within a specialist lithics report within the overall evaluation report produced by Dr E. Hicks. The data from the lithic evidence on site was then converted into a metadata set for the following commentary on its structure and classification.

Metadata has become a big buzzword within the heritage sector. Although once assigned to purely digital resources, metadata is increasingly used in descriptions for physical libraries and archives across the world (Day, 2001). The presence of digital data within archaeology has often received high praise due to several factors including interoperability and equality however the growing supremacy of this had led to an “ever-increasing dependence of archaeological knowledge production processes” (Hacigüzeller et. al, 2021, p.1). In the 1990s Wise and Miller (1997) identified data inaccessibility as one of the foremost barriers in the sector, whilst others highlighted that archaeology produces an exhaustive range of data which is only increasing with every year (OpenDataSoft 2016, Henninger 2017). It is worth noting that the usability of data is a key aspect linked to metadata, with metadata having the perceived feature of increased reusability unlike other systems that can be corrupted, lost, destroyed or inaccurate (Seaton et.al, 2023).

The metadata

The metadata for this assessment derived from an original dataset created on the 9th and 10th October 2023, a couple months after the evaluation’s completion. The original dataset was created by myself and followed the traditional formatting of the Colchester Archaeological Trust as designed by A. Wightman. The use of spreadsheets is consistent with every site carried out by CAT where lithic evidence is collected and consequently washed and sent for analysis. These spreadsheets were originally created by hand by the previous lithicist H. Martingell. As the company developed and digital recording and report writing became more common, the spreadsheets were created online. The dataset has since been edited extensively in accordance with ADS guidelines and are presented within this new format with the original comments and statistics. The metadata was produced on Microsoft Excel using one sheet and saved as a .xlsx file. The dataset is accompanied by a metadata statement as a separate document (ADS).

The lithic assemblage from this site numbered 17 pieces. 11 of these were assigned to datable contexts such as pits or ditches. Of these 11, eight were from prehistoric contexts whilst two were from Roman features and the remaining piece from a late Iron Age to early Roman pit. It is highly probable the three flints from non-Prehistoric contexts are residual although Iron Age flint working practises are evident within Essex (A Wightman per comms). Across the evaluation, six flints were recorded in unstratified contexts or geological layers. L1 was described as a modern ploughsoil which overlay a post-glacial silty-sand described as L2 (Hicks, 2023).

The data provided within the spreadsheet would be described as ‘contextual’ metadata (ADS, ClfA Dig Digital). The figure below is provided within guidance released by ClfA in partnership with DigVentures, which was born out of an overall Historic England funded project: 7796 *Creating a Sectoral Standard and Guidance for Managing Digital Data* (2019). As the figure one highlights, the image of soup cannot be understood or comprehended without its relevant labels. This example could be applied to the descriptive columns of the dataset describing dimension, colour, and knapping attributes. The phrase ‘data about data’ is often seen as a conundrum and makes it clear the need for data literacy as a commonplace skill (Kansa and Kansa, 2021). This is even more crucial given the variety of archaeological material. The material not only encompasses objects (such as finds), but visual and audio data, geographical information, verbal and written information and then as mentioned above the data about the data which can be as simple as finds bag descriptions about the artefacts they hold.

A	B	C	D
			
No data similar to No metadata!	Summary information similar to Collection level?	Nutritional information similar to Technical and descriptive metadata?	Recipe idea similar to Metadata about use and re-use?

Figure 1: A photograph of Campbell's Soup in four stages of data collection (Dig Ventures and ClfA Infosheet #4).

Explanation of structure

The columns are arranged in much the way a lithic expert would approach any knapped stone. It would prove illogical to start with attributes of retouch before establishing the basic characteristics of the piece first. After the data of context and dimensions the piece is established as either a ‘flake, blade or core’. The addition of specific tool types, like hand axe, can be included here but as a principle any knapped stone is of these three typologies (Butler, 2005).

The subheadings number 23 and were chosen to describe the specific attributes of the lithics within the assemblage. These subheadings are in the majority typological, however subheadings have been included to highlight the organisation and software involved within the dataset. The subheadings, as seen in figure two, uses a large amount of lithic terminology however no abbreviations have been used within the subheadings which is a change from the original dataset. Terms such as period dates have been described in full as opposed to abbreviations such as Meso (Mesolithic) or Neo (Neolithic).

The period dates themselves as derived from the FISH Chronology which are set out online but also within CAT's Company Glossary of Terms for report writing. Having a standardised use of dates is crucial for the accuracy of archaeological material and reporting as promoted ethically and professionally across the sector. Lithics have been used for thousands of years and many typologies remained the same throughout different groups and land uses so often dating cannot be specified as closely as pottery (Butler, 2005). Therefore, it is promising when lithics can be corroborated by period with accompanying pottery within features.

F/L No.	Finds No.	Context	Length mm	Width mm	Thick mm	Broken, hinge, failed previous removals	Flake, blade, core	Primary, Secondary, Tertiary	Cortex %	Raw material
F23	3	prehistoric pit (?Bronze Age)	20	19	7	broken both lateral edges	flake	secondary	30	dark grey flint
F36	10	prehistoric pit	142	38	22		multiplatform blade core	tertiary	0	dark grey flint

Figure 2: a selection of the subheadings present within the dataset (T. Gulliver Lawrence, 2024).

The metadata within the spreadsheet was formatted with the guidance of the ADS website (ADS, 2023). The spreadsheet has deliberately been created with no colour as the guidance highlights the stylistic changes to data “can then be lost during data migrations (especially to plain text)” (ADS, 2023). The font is a key aspect of any spreadsheet, and as recommended by the ADS alongside Microsoft Support the font is a clear and consistent use of Arial for both the subheadings and content. The font has been set as size 13 for the column subheadings and size 11 for the data to allow for accessibility and data consistency (ADS, 2023).

The assemblage's data has been laid out numerically by feature number. The use of this system replicates others used within CAT and its archiving guidelines. CAT uses a single context system and uses single numbers as opposed to cut and fill numbers. For example, a pit would be described as F1 and any fills consequently described as A, B or C. This means the presence of numbers is greatly reduced to only a few columns. With this in mind, the table starts at F23, and is divided into two with the unstratified material at the end. Despite the lack of feature numbers, the unstratified material is still ordered numerically by finds numbers.

The language of the metadata has been chosen using the Forum on Information Standards in Heritage thesaurus for Archaeological Object Types (2021). All the content has been checked via the thesaurus and several terms specific to lithic studies, such as ‘ventral’, were verified via the publication *Technology and terminology of knapped stone* (1999). This publication is multilingual and is an extensive thesaurus. Any numerical information provided has been rounded to whole numbers as follows CAT standards (A. Wightman per comms).

Justification of structure and classification of data

The structure of the data has been influenced by the previous structure used within the Colchester Archaeological Trust. The in-house lithics specialist created the spreadsheet formatting for his part time role which began approximately ten years previously. The order of the data has many advantages and in its original format it is in keeping with ClfA guidelines (2014). But upon further investigation I believed that the current format needed updating to match the ADS guidelines therefore made appropriate changes. In a broader overview these changes are highlighted by Gilliland (2011) who argues they allow for consistent standardisation with record keeping.

The spreadsheet's formatting is presented without colour. As suggested by the ADS the use of colour or certain stylistic techniques, like bold or italics, runs the risk of not transferring if the data is exported, reused or shared. However, from a lithic analysis perspective the use of colour can be helpful to distinguish certain factors evident within an assemblage. Figure three shows the dataset if it would have colour categorising the pieces by flake, core or blade typologies. Although from my perspective the additional colour aids percentage statistics within assemblages, the colour would not be encouraged by the usability principles of FAIR (Wilkinson et.al, 2016).

Length mm	Width mm	Thick mm	Broken, hinge, failed previous removals	Flake, blade, core	Primary, Secondary, Tertiary
20	19	7	broken both lateral edges	flake	secondary
42	38	23		multiple-platform blade core	tertiary
34	16	10		core debitage	secondary
40	22	2		flake	secondary
	13	3	snapped at proximal end	?blade	secondary
	6	2	snapped at distal end	bladelet	tertiary
30	18	3		flake	secondary
25	40	10		flake	secondary
35	15	5	plunge distal	retouched blade (notch)	tertiary
44	53	19		flake	secondary
24	23	8	?burnt	flake	secondary
27	30	19		flake core	secondary
43	22	18		blade/bladelet core	secondary
125	73	40	one break on one face	handaxe	secondary
	17	7	broken distal end	retouched flake/blade	tertiary
50	37	17		retouched flake (end scraper)	secondary
32	25	12		flake	secondary

Figure 3: A screenshot showing an altered version of the dataset with colour. The key is as follows: blue = flake, orange = core or core debitage, green = blade or bladelet, white = specific tool typology such as handaxe (T. Gulliver Lawrence, 2024).

The language and terminology used within the dataset are technical in nature due to the content matter of lithics. As highlighted by Henninger (2017) and Beck and Neylon (2012) the accessibility of metadata is underscored by its content and how that is presented linguistically. However, the use of the FISH Thesaurus and additional use of the Multilingual Terminology of Knapped Stone (1999) allows words to be researched and standardised. The FISH Thesaurus is used by CAT for their ADS uploads and is a leading standard in archaeological and heritage sector terminology. As FISH highlights on their website, the inclusion of a standard thesaurus aids the sharing of cultural and heritage information (FISH, 2021).

The data has been classified by typology within the spreadsheet. The template provided by the ADS for spreadsheets did not have the formatting and structure which would be conducive for an assemblage and its attributes. Although use of typologies can lead to inconsistencies, such as label noise, it is plausible that with editing and standardisation checks by third parties like the ADS can eliminate these (Henninger 2017, Siddiqui et. al 2022). Classification by typology can lead to issues as often lithics can be multipurpose and not of one singular use or function (Butler, 2005). However, the addition of a 'tool or comments' column for each piece allows the piece to be explored in more detail. These notes are relatively short as both lithic analysis and reporting are governed by strict budgets and deadlines. It would be irresponsible to present the majority of findings within the workings as opposed to the full report within an overall context. A spreadsheet is viewed as a correct method of representing tabular data, such as the lithic attributes presented from the Birch Quarry assemblage (ADS, 2021).

Conclusion

Overall, the dataset provides an accessible and consistent spreadsheet of which a number of attributes can be recognised in relation to lithic analysis. Spreadsheets and databases such as these are key to archaeological specialisms, particularly with the inclusion of dimensions and descriptive evidence like colour. The assemblage from Birch Quarry is small at only 17 individual pieces however with the excavation of large, multi-location sites the application and use of metadata within archaeological specialisms is likely to increase. Projects such as infrastructure and road networks often run into the thousands for numerical data, as do complex urban sites. The single context system at CAT decreases the volume of these numbers considerably however units operate differently throughout the UK. As highlighted by Edwards and others (2011) the existence of large data sets may allow for new methodologies regarding patterns within science. Patterns with lithics, especially with older lithic technologies, can suggest cross-cultural learning and evolving technologies often spread by migration as seen within Palaeolithic archaeology. In summary, lithic studies may be very in need of this cross-collaboration work which metadata can both support and invent. Metadata must become a more universally accepted idea to allow its growth and consistency which it so rightly deserves.

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Appendix

Gulliver Lawrence, T. (2024) Metadata Collection Form of Lithic Assemblage Dataset of Birch Quarry Evaluation, Essex, 2023.

Gulliver Lawrence, T. (2024) Lithic Assemblage Dataset of Birch Quarry Evaluation, Essex Excel Spreadsheet, xlsl file.