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From Site to Museum: a Critical Assessment of Collection History on the Formation and Interpretation of the British Early Palaeolithic Record

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Abstract
The British Lower and Middle Palaeolithic record makes an important contribution to understanding the early occupation of northern Europe, in particular, through the detailed, systematic and multidisciplinary excavations of key sites. However, it is the historic collections, amassed by a large number of collectors over a 100-year period from the 1860s to the 1960s, that contribute the majority of the artefact record accounting for almost 80% of the handaxes and over 85% of finds locations. Although much of this material lacks the contextual details of excavated assemblages, it still forms an important and large body of data for the British early Palaeolithic. This paper explores the collecting practices of the individuals responsible for the majority of the old collections and demonstrates that through a study of collection history, from discovery to museum curation, the material provides a dataset that can be used in a critical way to address broad-scale questions concerning changes in material culture, demography and landscape use. Such studies also have implications for the interpretation of the Palaeolithic record, beyond the sharp focus of modern excavation.

Keywords Early Palaeolithic · Collecting · Museum · Handaxes · UK

Introduction

Britain has a remarkable artefact record for the Lower and Middle (early) Palaeolithic, amassed over a 150-year period from the early years of collecting after the birth of the subject in 1859, to the latest excavations of sites of international importance. Although

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much of the research focus in recent years has been on the excavated assemblages, there has been a growing interest in the much larger record provided by assemblages that were collected in the first 100 years of the discipline. These collections not only illustrate the formative years of the subject and its pioneers, but they also provide details of sites that no longer exist or have been buried by urbanisation. Britain also uniquely benefits from the detailed recording of these collections in national gazetteers produced by Roe (1968) and Wymer (1968, 1985, 1999), which formed the basis of the English Rivers Palaeolithic Survey (TERPS) with the creation of a dataset of every known Lower and Middle Palaeolithic artefact recorded from Britain.

Much of our understanding of the early Palaeolithic in Britain has been achieved through recent excavations, which have often provided detailed insights into human behaviour, such as Boxgrove (Roberts and Parfitt 1999), Hoxne (Singer et al. 1993; Ashton et al. 2008a), Barnham (Ashton et al. 1998, 2016) and Beeches Pit (Gowlett et al. 2005; Preece et al. 2007). However, alongside this work, there have been important attempts to use the much larger TERPS data to answer broad-scale questions about Britain's Palaeolithic past. Despite the frequent problems of poor contextual details, or of using collections from secondary fluvial contexts, there have been notable advances in developing methods to address these questions. Some research has focussed on technology and typology in both regional and national studies that, for example, suggest patterning in handaxe form through time (Hosfield 1998; Davis 2013; Bridgland and White 2015; White 2015). Other work has used the river terrace systems to document chronological changes in artefact numbers and densities. These changes have been argued to reflect a decline and occasional absence in human population that is related to the increased isolation of Britain during successive interglacial periods (Ashton and Lewis 2002; Hosfield 2001; Ashton and Hosfield 2010; Ashton et al. 2011, 2015; Davis 2013).

A fundamental problem in using these old collections is the inherent bias in collected as opposed to excavated assemblages that arises from the way artefacts were recovered and subsequently curated to form the collections. This is particularly true for the British Palaeolithic as many of the collections date from the late 19th to early 20th centuries. Moreover, museum collections are the end-product of a series of natural and human selective stages from original artefact production and discard, geological and site formation processes, preservation, discovery, collection and dispersal activities and finally museum curation.

Site formation processes and selective recovery of artefacts have been discussed at the assemblage level, such as at Foxhall Road, Ipswich and Ebbsfleet (White 1997; White and Plunkett 2004; Scott 2010; Shaw and Scott 2016), and regional studies have begun to develop methods for addressing the issues at the larger scale (Hosfield 1999; Ashton and Hosfield 2010; Ashton et al. 2011; Pope et al. 2016). This paper takes a more in-depth approach by studying the full collection history of non-excavated artefacts from their discovery to museum curation. The primary aim is to identify how these collections can be used in a robust way to understand broad-scale patterns in the British early Palaeolithic. It is a product of the *Mapping Palaeolithic Britain Project*, funded by the Leverhulme Trust, and forms the platform for the second part of that project, which has examined the route-ways, dispersals and landscape use of different colonising populations over the last 800,000 years (Ashton et al. 2018).

Materials and Methods

The collections held by the British Museum (BM) provide the core dataset for assessing the influence of collecting on the formation of the British early Palaeolithic record. The BM collections are well organised, and many are supported by archival material. The current research has enhanced the data collected from an earlier pilot study by adding information on geological context and collection history (Ashton et al. 2015). For each artefact, there is information on curation, site location and artefact type, and, where possible, the site locations are correlated with TERPS site identifications to aid future use (Table 1). The level of detail available for each artefact varies, particularly in regard to the precision of site location and completeness or, otherwise, of the collection history. The present study also includes additional data collected from the Ashmolean Museum, Cambridge University Museum of Archaeology and Anthropology (CUMAA), Norwich Castle Museum and Reading Museum (Table 2). Additional data has also been added from most of the Hampshire and Dorset museums for artefacts from the Solent River system (Davis 2013).

The collection database, including excavated assemblages, constitutes c. 78% of the total British record with over 124,000 artefacts (Table 3). Although there are some gaps in the database, it provides a representative sample of collections and of typical collectors for the British Palaeolithic. Some sites are clearly under-represented, but the dataset gives an indication of most of the major collection areas and key sites. New excavations have contributed major assemblages, but from only 15% of sites, and they are not relevant for this particular study. Once the excavated assemblages are removed, the dataset consists of 40,704 artefacts, which can be termed the "old collections". They form a major part of the British early Palaeolithic record, contributing over 85% of known artefact locations and containing 78% of the handaxes (Table 3).

In order to assess collection history and its influence on assemblage composition, the principal collectors are assessed using five distinct measures; quantity, range, focus, selectivity of collecting and quality of archive (Table 4). Quantity is measured by the number of artefacts collected and, therefore, the effect on the dataset. The range can be measured by using the same 20 × 20 km grid system (based on the UK National Grid) adopted by Ashton et al. (2018). The number of squares from which more than four artefacts were collected indicates the collector's range. Focus evaluates the concentration of collectors on specific sites and can be measured by the number of artefacts per site.

Table 1 The main database fields for which data was collected

Curation details	Site location	Artefact types
Museum	Site name	Handaxes
Collection	Easting	Flakes (non-Levallois)
Registration no.	Northing	Cores (non-Levallois)
Original collector	Parish	Flake tools
Previous museum or collector nos	County	Levallois flakes, points, blades
TERPS site ID		Levallois cores

Table 2 Numbers of collections (including collectors and institutions), sites and artefact types for each main museum in the dataset

Museum	No. of named collections[a]	Sites	Counties	Total	Handaxes	Cores/flakes	Levallois
Ashmolean	89	280	18	1477	1135	321	21
British Museum	247	1009	22	116,200	14,876	100,012	1312
CUMAA	11	29	9	275	128	69	78
Norwich	60	60	1	550	157	387	6
Reading	41	121	4	1756	1152	575	29
Other museums	63	155	5	3867	3141	652	74
Total	472	1438	22	124,125	20,589	102,016	1520

[a] Many collectors contributed to more than one museum

Selectivity of collection adopts the method of Ashton et al. (2018) which uses the percentage of handaxes in the complete collection. Higher percentages reflect a bias towards handaxes, which may be the result of selective identification and retention of these artefacts or the failure to recognise other artefact types and the role of workmen who acted as "proxy collectors". A lower percentage of handaxes indicates that a more representative sample of artefacts has been collected. The value of a collection can be enhanced by the existence of a documentary archive or other supporting information. This might be information written on the artefacts, accompanying labels, associated notebooks or full publications. A subjective characterisation of the quality of archive material has been given as good, average or poor. In some cases, archives or labels may have been lost, and therefore, the characterisation does not necessarily reflect the original collector. Those collections where no archive has been located are also assessed as "poor".

Collecting the Palaeolithic

The visit in April 1859 by Joseph Prestwich and John Evans to the Somme Valley marked the formal recognition of the association of handaxes with extinct mammals. Evans' impassioned plea to the Society of Antiquaries for everyone to "*search also for*

Table 3 Breakdown of the collections database, showing full dataset, including recent excavations and just-collected sites. This is further sub-divided to show collectors according to the number of artefacts that they collected

	No. collectors or sources	Sites	Total artefacts	Handaxes
Total collections including recent excavations	472	1438	124,125	20,589
Collected sites	425	1226	40,704	16,112
≥ 10 artefacts/collector	132	1064	40,124	15,647
≥ 50 artefacts/collector	63	941	38,460	14,524
≥ 100 artefacts/collector	40	878	36,793	13,473
≥ 500 artefacts/collector	15	705	31,262	11,309

Table 4 Measures to assess collection habits for each collector

Measure	Determined by	Classification	Rationale
Quantity	Number of artefacts collected	Large ≥ 1000 Medium 300–999 Small < 300	Measures the contribution of the collector to the whole dataset
Range	Number of 20 × 20 km squares from which > 4 artefacts were collected	National > 10 squares Regional 5–10 squares Local 1–4 squares	Measures the geographical range over which the collector mainly operated. Outlying squares with 4 or fewer artefacts are excluded
Focus	Number of artefacts per site	High ≥ 100 Medium 20–99 Low < 20	Measures the detail in which the collector operated in each site
Selectivity of collecting	% of handaxes in whole collection	Good < 35% Average 35–65% Poor > 65%	Measures whether the collector focused on just handaxes or had a wider interest in other artefacts
Quality of archive	Existence of publications, notebooks, catalogues and artefact markings	Subjective assessment: Good: context and location with year of discovery Average: location with some additional information Poor: No known archive	Where archives survive, the measure shows the attentiveness of the collector to context

flint implements such as these I have described" led to the widespread hunt for artefacts in ancient river gravels across Europe, none more so than Britain (Evans 1861, 307; Gamble and Kruszynski 2009). This search coincided with an industrial and engineering revolution, providing conditions where interest in Palaeolithic archaeology could flourish. Many of the extant Palaeolithic collections were first instigated by discoveries made through quarrying, urbanisation and infrastructure projects, such as canal, road and railway construction. From the 1860s onwards, commercial pits proliferated to keep up with demand for the sand, gravel and brickearth needed for Britain's expanding urban landscape and infrastructure. The upsurge in the extraction of these deposits coupled with the new understanding of human antiquity created an ideal environment to foster antiquarian and public interest in Palaeolithic archaeology and offered the perfect opportunity for collectors to access Pleistocene deposits and recover artefacts.

These "old collections" give an indication of the geographical focus of the discoveries in the earlier years of the discipline (Table 5). The main foci were the large spreads of flint-rich fluvial gravels exposed by quarrying in southern and eastern England. In these areas, not only was flint widely available for Palaeolithic tool production, but the quality and size of many of the tools made artefact recognition that much easier for 19th and 20th century collectors. This southern and eastern pattern was reinforced by the effects of glaciation in northern and western Britain, which either destroyed or covered all but the latest of Pleistocene deposits (Figs. 1 and 2).

The gravels of the River Thames feature prominently with sites such as Swanscombe and Baker's Hole in the Lower Thames or sites in the Middle Thames around Maidenhead such as Furze Platt, all attracting large numbers of collectors. The Solent Basin was also important with quarries at Dunbridge, Romsey, Warsash and coastal exposures at Boscombe. Other important areas included the rivers and coasts of north Kent such as Sturry, whilst Suffolk was also a focus with the gravel quarries of Warren Hill, Lakenheath and Feltwell. It is clear that collecting from quarries covered most areas of southern and eastern England extending as far as Knowle Farm in Wiltshire, Broom in Dorset and Farnham in Surrey.

Clay pits where "brickearth" was extracted for brick manufacture to feed further industrialisation were also targeted by collectors. Often, these were colluvial and alluvial deposits on valley edges or bottoms, such as at Crayford in London and High Lodge in Suffolk, or lacustrine deposits, such as at Hoxne. Occasionally, brickearths were exploited from dolines, such as the Chiltern sites of Caddington, Gaddesden Row and Round Green.

Table 5 Most popular collecting sites with artefact numbers arranged in approximate chronological order of initial collection

Site	Collectors	Site type	1st decade of coll	Total	Handaxes	Cores/ flakes	Levallois
Warren Hill	29	Quarry	1860s	1822	1108	711	3
Reculver	19	Coast	1860s	193	112	79	2
Hoxne	16	Quarry	1860s	50	26	24	0
High Lodge	14	Quarry	1860s	554	73	481	0
Thetford (Redhill/Whitehill?)	12	Quarry	1860s	91	66	25	0
Shrub Hill, Feltwell	11	Quarry	1860s	173	158	14	1
Broom	20	Quarry	1870s	1320	1189	130	1
Hitchin	11	Quarry	1870s	110	84	24	2
Swanscombe (all sites)	45	Quarry	1880s	10,392	2325	8066	1
Swanscombe, Barnfield Pit/Milton St	29	Quarry	1880s	9138	1927	7210	1
Crayford	15	Quarry	1880s	422	11	345	66
Hanwell	10	Quarry	1880s	202	115	86	1
Farnham	24	Quarry	1890s	422	371	49	2
Knowle Farm	12	Quarry	1890s	327	272	55	0
Bakers Hole/Northfleet	23	Quarry	1900s	1762	57	1347	358
Dunbridge	14	Quarry	1900s	254	252	2	0
Boscombe	18	Coast, Quarry	1910s	86	74	12	0
Lakenheath	14	Quarry	1910s	238	215	23	0
Belbin's Pit, Romsey	13	Quarry	1910s	96	91	3	2
Furze Platt	13	Quarry	1910s	480	209	271	0
Sturry	15	Quarry	1920s	1261	778	482	1
Warsash	11	Quarry	1920s	379	278	87	14

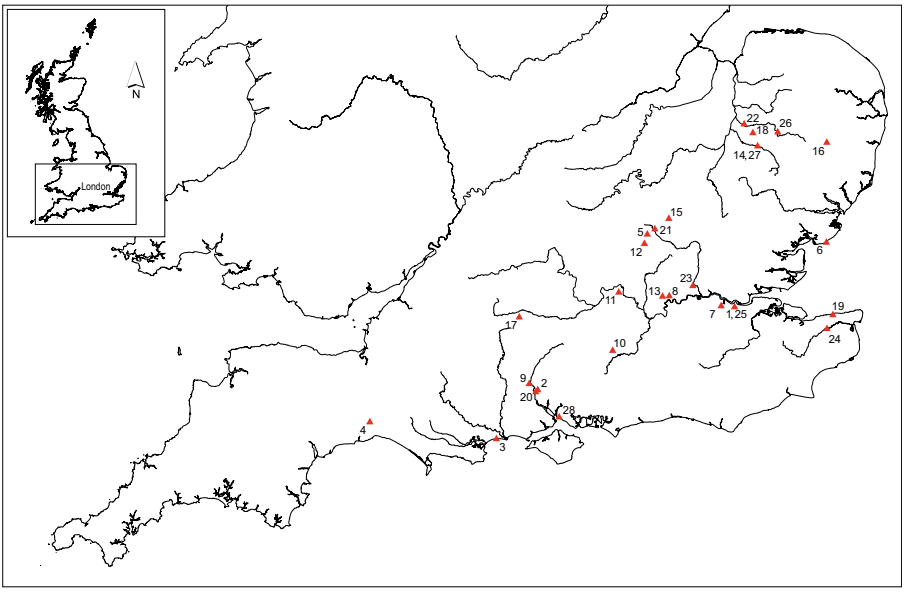

Fig. 1 Locations of sites mentioned in the paper. 1. Baker's Hole, Northfleet, 2. Belbin's Pit, Romsey, 3. Boscombe, 4. Broom Pits, 5. Caddington, 6. Clacton, 7. Crayford, 8. Creffield Road, Acton, 9. Dunbridge, 10. Farnham, 11. Furze Platt, 12. Gaddesden Row, 13. Hanwell, 14. High Lodge, Mildenhall, 15. Hitchin, 16. Hoxne, 17. Knowle Farm, Savernake, 18. Lakenheath, 19. Reculver, 20. Romsey, 21. Round Green, 22. Shrub Hill, Feltwell, 23. Stoke Newington, 24. Sturry, 25. Swanscombe, 26. Thetford, 27. Warren Hill, 28. Warsash

Despite industrialisation, most quarrying was done by hand, which provided favourable conditions for identifying artefacts. The larger scale commercial pits that proliferated at this time also had the advantage that they remained open over prolonged periods and offered collectors a greater opportunity to access and monitor deposits. Smaller, ad hoc pits were often quickly filled in or built over and unless local collectors were vigilant potential sites could be easily missed. Work at the pits was often seasonal with workmen carrying out different jobs during the summer months.

> "… *Summer is a bad time for visiting the pits as they generally get filled in during the summer and are infested with weeds and insects—I only get things when the men are digging—i.e. from Dec. to Mar. …*" (Worthington Smith to Sturge, 10/08/1904, BM Archive)

Although digging by hand provided the opportunity to see artefacts, the common method of undercutting the gravel layer until the gravel collapsed into the pit meant that stratigraphic information was often limited as artefacts were generally discovered during the process of grading the gravel by sieving.

The change from hand-digging to mechanised extraction during the early part of the 20th century had an important impact on recovery as there was much less opportunity to see artefacts. The timing of mechanisation varied across the country and reflected the size of the quarry and commercial company. Although mechanisation increased dramatically after the First World War, correspondence

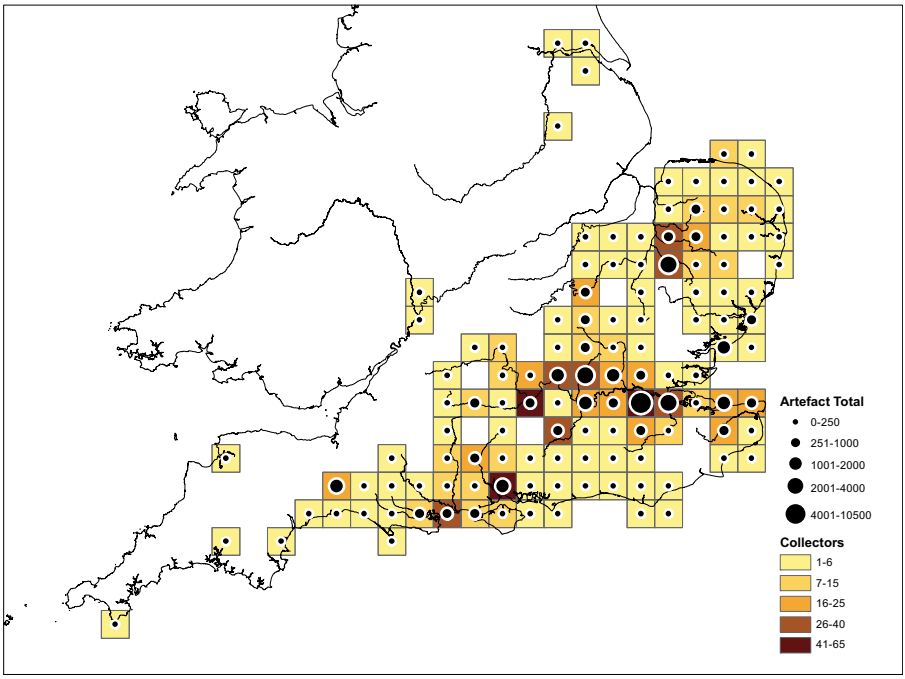

Fig. 2 Geographical variation in collector activity and artefact totals in 20-km grid squares (based on Ordnance Survey)

between Butchard, the quarry manager at Swanscombe, and Reginald Smith at the BM shows that mechanisation was impacting on rates of discovery before the war:

> "*There is a face about 30 feet deep exposed at our Barnfield Chalk quarry which might interest you although no specimens have been found there lately but this may be owing to the system we are adopting of recovering the overlie—be* (sic) *means of a steam navvy—*" (Butchard to Smith, 16/09/1910, BM archive)

Elsewhere, mechanisation generally occurred later. At Broom in Dorset, it was introduced between 1936 and 1938 (Hosfield and Green 2013, 66). In the catchment of the former River Solent, most sites had been collected prior to the early 1930s when mechanisation seems to have first been introduced (Hosfield 1999; Davis 2013). In the Bournemouth area, there was a general trend from the 1870s towards fewer, larger quarries, whose size peaked between 1910 and 1930 (Ashton and Hosfield 2010).

Whilst aggregate extraction provided the opportunity for early collectors to gain access to Pleistocene deposits, it also provided the materials for a building boom that would render many areas inaccessible to later collectors. Urbanisation, particularly the expansion of London, covered large spreads of artefact-bearing gravels, and, therefore, the old collections provide the main record from areas that are no longer accessible. The value of having the old collections for study

has to be balanced against the bias that they bring from their clear focus on sites from fluvial gravels from southern and eastern England.

The Structure of Collecting: The Main Antiquarians and Their Relationships

Critical to achieving a better understanding of the old collections is an assessment of how and by whom they were initially recovered. The old collections result from the work of 425 collectors, of whom the majority (c. 69%) contributed fewer than ten artefacts each (Table 3). There are only 40 collectors (c. 10%) who had more sizable collections, with 100 artefacts or more, but who contributed over 90% of the record. It is these 40 collectors who are the subject of more detailed discussion and analyses in this paper.

One of the most influential people in the development of the subject was John Evans (1823–1908). Already by 1859, he was a respected antiquarian and natural scientist, one of a breed of eminent amateurs of independent means, making his money from the family's paper mills. He quickly became the main authority in the growing subject of Palaeolithic archaeology, particularly after his publication of *The Ancient Stone Implements, Weapons, and Ornaments, of Great Britain* in Evans 1872 and the second edition in 1897. His "call to arms" in 1859 led to a boom in collecting from a wide range of individuals from different backgrounds, and his own collections were dependent on their efforts, writing that he was "*… indebted to numerous collectors throughout the country for having called my attention*

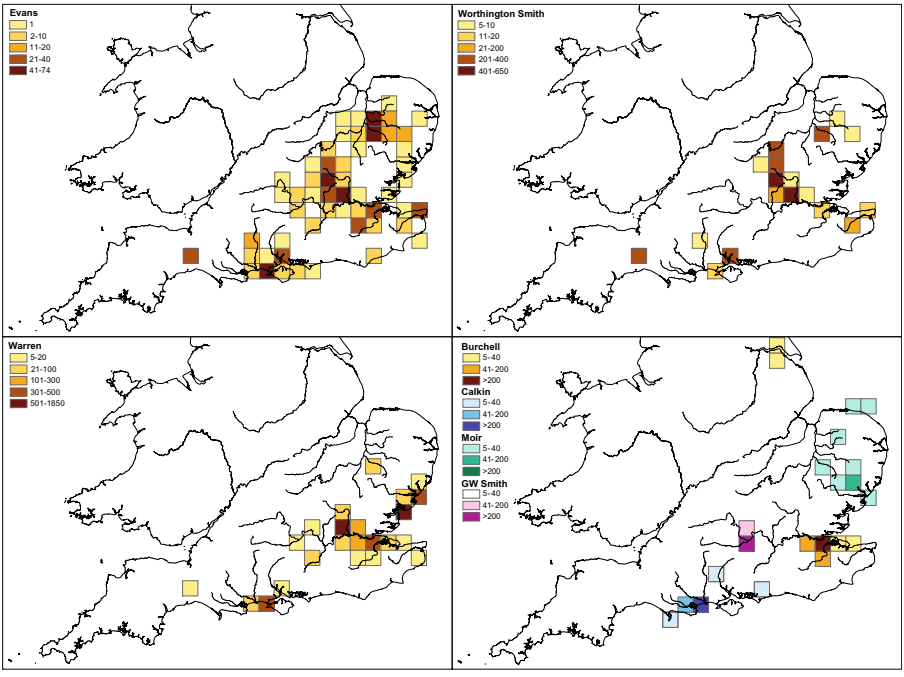

Fig. 3 Collecting patterns of selected individuals reflecting the geographical range and focus of their activities. John Evans (group 1), Worthington G. Smith, Hazzledine Warren, J.P.T. Burchell (group 2), J. Reid Moir (group 3), J.B. Calkin (group 4) and George W. Smith (group 5)

to specimens that they acquired, and for having, in many cases, sent them to me for examination" (Evans 1897, viii). Although the collection was comparatively small and dominated by handaxes, it was representative of a wide array of sites that illustrated the first understandings of the Palaeolithic (Fig. 3a).

The academic publications of Evans and other more popular accounts, together with the rise in local societies and field clubs around London in the later 19th century, introduced Palaeolithic archaeology to a wider audience and expanded the numbers of potential collectors outside the grander national societies. The Essex Field Club, for instance, was founded in early 1880 and within two months it had more than 140 members. Clubs and societies acted as hubs of knowledge exchange and helped to shape networks of collectors who inspired and influenced others. Knowledge and, in this context more importantly, artefacts were transferred between interested individuals, although relationships were inevitably shaped by the socioeconomic status of the parties involved. The practices of the collectors varied greatly; some were derided as "*mere collectors*", "*desirous of a collection of implements, and not a collection of facts*" (Hinton and Kennard 1905, 76). The necessity of paid employment curtailed the collecting activities of some amateur collectors both in terms of where and when they could collect and how much they were able to pay for artefacts when time prohibited first-hand collection. Others spent their entire spare time collecting, such as Benjamin Harrison, the post-master in the small village of Ightham, who scoured the quarries and fields on the North Downs of Kent and built up important collections, including eoliths.

If Evans acted as the hub and inspiration for the growing army of collectors and drove the subject forward on the international stage, there were three main antiquarians who provided the in-depth knowledge on the ground, not only of artefacts, but detailed observations on the contexts from which they came. Flaxman C.J. Spurrell (1842–1915) lived in south-east London and relied on his inherited wealth to allow him to pursue his scientific interests. He is best known for his collections from Crayford and was among the first to develop the technique of refitting (Spurrell 1880a, 1880b, 1883, 1884). During the same decades, John Allen Brown (1831–1903) took up Palaeolithic archaeology after retiring at a fairly young age from the family jewellery business. His collections from the gravel pits and building projects in west London, such as Creffield Road in Acton, still form the most important assemblages from that area (Brown 1883, 1886, 1887a, 1887b, 1887c, 1888, 1889; Scott 2011). The third great pioneer was the botanical illustrator, Worthington G. Smith (1835–1917; Dyer 1978). At first, living in north London, he amassed important collections from Stoke Newington, Clapton and Stamford Hill (Fig. 3b). Citing ill-health, he moved to Dunstable in 1885, where he continued to discover, collect and record from sites on the Chilterns, such as Gaddesden Row, Round Green and, most famously, Caddington (Smith 1879, 1880, 1882, 1883, 1884, 1887, 1889).

Another major figure was Dr. William Allen Sturge (1850–1919). He had been a physician to Queen Victoria, practising in Nice, where he bought collections from Britain, France and beyond. On retirement, in 1907, he focussed his attentions on the pits and fields around his new home at Icklingham Hall in Suffolk. Within a year, he had become a founder member and first president of the Prehistoric Society of East Anglia, which later became the Prehistoric Society. Through a series of publications, he fast became a prominent figure in the wider debates on the Palaeolithic (Sturge 1911, 1912) and was dealing with the main collectors of the time, including Worthington

Smith, Allen Brown and Benjamin Harrison. Working on a national scale, Sturge continued the work of Evans in drawing together many of the collections from a wide array of sites. Unlike Evans, he also collected and bought other material as well as handaxes, which included important items such as refitting flakes from Caddington and Levallois artefacts from Creffield Road in Acton. On his death, in 1919, his collection was bequeathed to the BM, and without his input, many of these artefacts would have been dispersed elsewhere.

The richness and breadth of Worthington Smith's archives provide the best illustration of the relationships between collectors and artefact recovery practices during the first few decades of the discipline. His correspondence with Evans reflects their relationship, with a deferential tone shown by Smith. The letters kept Evans regularly up to date with the latest discoveries accompanied by the best examples of artefacts that had been recovered. The delicate matter of money was dealt with by Smith reporting what it had cost him to obtain the artefacts and then leaving it to Evans to reimburse him as he saw fit.

Smith's letters also refer to his relationships with other collectors and show how he often acted as the link, mentioning to Evans his contact with Henry Prigg in Suffolk and Benjamin Harrison in Kent. Not all collectors were to be trusted; in a letter marked "*Private—to be destroyed*" Smith warns Evans against a Mr. Greenhill, who had claimed the "Palaeolithic Floor" at Stoke Newington as his own, accusations that were repeated in letters to Sturge in 1906. Smith also corresponded with curators at the major museums, such as Arthur Wollaston Franks at the BM, and donated artefacts to Henry Woodward for the British Museum (Natural History).

The letters further reflect the changing relationship with the workmen at the sites and Smith's own cautious attitude towards them. In a 1906 letter to Sturge, he reminisced that during the first years of his work that "*I found every implement and every flake myself. I had no converse or dealings whatever with the men …*" by limiting his search of the spoil heaps to evenings, Saturday afternoons and Sundays (Smith to Sturge, 21/02/1906, BM Archive). However, by the late 1880s, he was also collecting from workmen, offering tips on how to fraternise with them by not being "*too well dressed*" and "*conversing in a friendly and familiar manner*" (Smith 1888). His relationship with them evolved. Initially, he kept them in the dark about the objects that he asked them to collect, fearing that explanation might lead to the production of forgeries (Smith 1894, 294). Instead, he paid workmen to dig the gravel and then lay it out for inspection. But, by the first years of the 20th century, he had trained a group of brickmakers at Caddington to recognise flaked flint (Smith 1904, 26) and at Gaddesden Row he refers to a "*sackful of flints selected for me by the men*" (Smith 1916, 49).

The fear of forgeries was a genuine concern with the demand for finely made handaxes leading to inflated prices, salting of sites and production of forgeries (O'Connor 2007, 88). Smith describes the lengths that plasterers and carpenters would go to create stained and abraded handaxes (1894, 294–298). Many forgeries ended up for sale in the City of London, with labels such as Gray's Inn Lane fetching higher prices. His reluctance to employ workmen also stemmed from his desire to have a more representative collection of artefacts. He wrote "*Some of our ignorance is undoubtedly caused by the undue attention which has been bestowed on the collection of ornate implements, and to the employment of gravel-diggers for their collection. No greater*

mistake can be made than the mere getting together of the more highly-finished and perfect implements." (Smith 1879, 279).

From 1900, new links were being forged between collectors, quarry companies and museums when the first professional practitioners were appointed. Reginald Smith worked at the BM from 1899, and, in 1912, an agreement was in place to work with Henry Dewey, newly appointed by the Geological Survey. Their prime focus was on the artefacts being discovered at the expanding quarries of the Associated Portland Cement Manufacturers at Swanscombe and nearby at Baker's Hole. The correspondence between Butchard, the quarry manager at Swanscombe, and the BM illustrates the interest and support for the emerging discipline, with one letter from Butchard saying that the directors are "*at all times willing to do whatever they can to advance scientific knowledge*" (05/05/1912, BM Archive). The agreements led to major collections being transferred directly to the BM and representative examples to other museums in Britain.

Although the market in prize handaxes continued through the 20th century, the example set by Spurrell, Allen Brown and Worthington Smith led to a new generation of amateur collectors, many of whom made significant contributions to the subject. A key figure was Hazzledine Warren who mainly collected in north London and Essex, most notably at Clacton, where he discovered the famous spear (e.g. Warren 1911, 1912, 1951; Fig. 3c). Other significant figures included James Reid Moir, who collected in Suffolk (Moir 1918, 1927; Moir and Hopwood 1939; Fig. 3d), Major J.P.T. Burchell in Kent (e.g. Burchell 1933, 1936, 1954; Fig. 3d) and A.D. Lacaille, predominantly in Berkshire and Buckinghamshire (Lacaille and Oakley 1936; Lacaille 1940, 1954). Importantly, all of their collections were transferred directly to museums (see subsequent text).

Substantial collections were also amassed from Swanscombe by Alvan T. Marston, a dentist from Clapham, who made detailed records of the beds and sections from which they came. His most famous discoveries were the first two parts of the Swanscombe skull in 1935 and 1936 (Marston 1937). However, his paper was overshadowed by the publication of the newly formed Swanscombe Committee (1938) composed of professional establishment figures such as Kenneth Oakley, Martin Hinton and Alfred Kennard of the British Museum (Natural History), together with Christopher Hawkes at the BM. The events surrounding the discovery reflect the changing relationship between amateur antiquarians and the growing body of professional practitioners.

From 1960, collectors continued to make important contributions, but the combination of mechanisation, a dwindling number of amateur enthusiasts and the increasing number of excavations meant that the heyday of collecting was near an end. Today, it is rare for the few remaining collectors and non-paid practitioners to be allowed access to active quarries, and, as a result, there has undoubtedly been a significant loss of information. However, on occasion, those who devote their spare time to the subject continue to make discoveries of great importance. The late Middle Palaeolithic site of Lynford, Norfolk, would not have been discovered without the efforts of John Lord who had been watching and recovering artefacts from the quarries for several decades (Lord 2002; Boismier et al. 2012). Terry Hardaker in Oxfordshire continues to record the geological sections and recover artefacts at quarries in the Upper Thames sites in Oxfordshire (Hardaker and MacRae 2000). Most recently, artefacts and vertebrate fossils are being recovered, recorded and reported from the beaches around

Happisburgh by Darren Nicholas, Jo Leonard and Tim Grimmer. This work has more than trebled the number of artefacts and vertebrate remains from the Happisburgh sites (Parfitt et al. 2010; Ashton et al. 2008b, 2014; Lewis et al. in press) and led to the discovery of a new Lower Palaeolithic location at Eccles North Gap. Without this work, the material would have been lost to the sea (Bynoe et al. in prep.)

The Routes from Collection to Museum

Although much is known about the collectors, there is less understanding of the often circuitous routes by which their collections ended up in museums (Fig. 4). After initial recovery, either by workmen or collector, artefacts were sold, swapped, donated and bequeathed, often with little supporting documentation. Sometimes, the passion for acquiring artefacts left collectors with storage difficulties and the artefacts would periodically be rationalised through sales, donations or, even, discarded. Collections were often completely dispersed during the lifetime of the collector, and each additional step added the opportunity for further selection and for loss of any accompanying information.

The motivation for dispersal was not always pecuniary or logistical. Some artefacts were transferred as a way of spreading knowledge. Llewellyn Treacher's collection from the Middle Thames was widely dispersed during his lifetime by sale and exchange, and Mabel Treacher proudly exclaimed that "*Not hundreds but thousands of paleoliths came out of Furze Platt and are gone all over the world … with Llewellyn's labels on them.*" (Cranshaw 1983, 2). In many cases, artefacts recovered by one collector from a site became split between multiple museums. Worthington Smith's collection from Caddington is currently split between 14 different museums (Roe 1968), and Smith records in his "List of Palaeolithic Implements" (BM Archive) giving away 294 artefacts from Warren Hill to over 40 collectors and museums. The

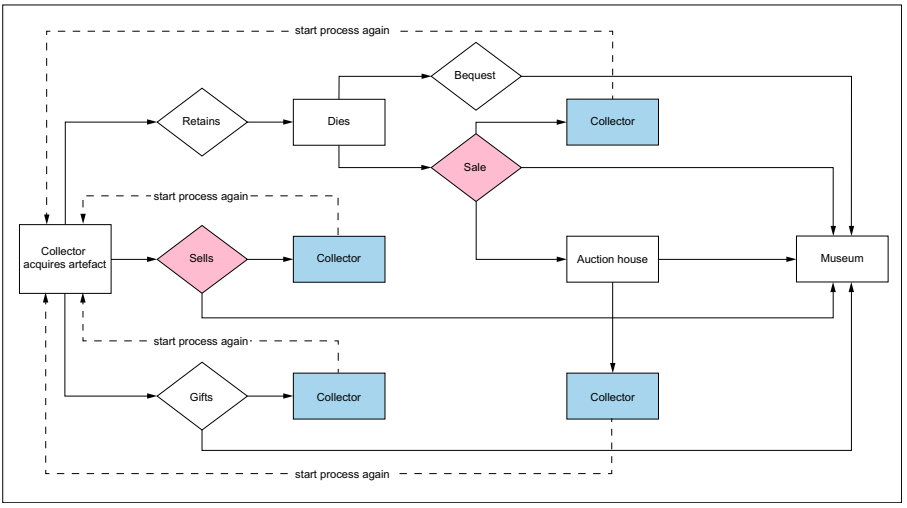

Fig. 4 Routes of artefact dispersal from discovery to museum curation. The process begins when an artefact is acquired by a collector who may retain, sell or give away the object. This may result in the artefact being acquired by a museum or by another collector. Artefacts can be further dispersed as the result of a sale or bequest. Artefacts may also be transferred between museums. At each stage, artefacts may be lost or discarded

complexity of the "life history" of individual artefacts from the same collector is exemplified by four artefacts originally recovered or acquired by Worthington Smith that eventually ended up in the BM via very different routes (Table 6).

Museums were also part of the dispersal process, usually with the aim of providing regional museums with "type series". The BM oversaw the distribution to regional museums of "Northfleet kits" of representative artefacts that were recovered by the Associated Portland Cement manufacturers. Museum collections have also been casualties of both natural and man-made disasters. The BM collection from Dr. Thomas Armstrong Bowes lacks provenance details because original labels were lost during the sea-floods of 1949 and 1953 whilst curated at the Herne Bay Records Society. Rehousing, reorganising and reboxing of collections have also led to a loss of information, where archive notes might refer to original storage boxes and drawers, leading to unintentional severing of the link between artefact and supporting documentation.

Despite the problems associated with the dispersal of collections, many artefacts can be successfully traced back to the original finder using a combination of accession documents, notebooks and other archives together with artefact labels. Sometimes, labels, including lot numbers from auction houses, help track an object back to its original finder. One such example is the collection of Allen Brown from Creffield Road, Acton (Scott 2011). On his death, in 1903, his collection was passed to George Lawrence, who subsequently sold it to Sturge. After Sturge's death, in 1919, his collection of more than 100,000 pieces, including the Creffield Road material, was bequeathed to the BM. Although Brown's catalogue has been lost, a combination of publications (1885, 1887, 1889), artefact labels and archive left by other collectors led to a successful reconstruction of many finds locations in the area of Creffield Road and identification of the contexts of most artefacts (Scott 2011).

Through examination of the broader problem of tracking artefact dispersal, the collections dataset can be used to show the routes between collector and museum

Table 6 Post-discovery life history of four artefacts listed in Worthington Smith's List of Palaeolithic Implements and currently curated at the British Museum. Note the roles played by Sturge and Evans

Artefact	Artefact life history	Description
Springfield Pit, Kempston WGS No 1051 (Sturge No 411, BM 2011,8109.36)	Smith > Greg > Sturge > British Museum	Recovered by WGS 4 November 1882 > given to RP Greg, Coles Park, Buntingford > sold to Sturge > bequeathed to British Museum
Caddington WGS No 1766 (BM 1998,0101.2)	Smith > Dewey > Ancient & Oriental > British Museum	Recovered by WGS 5 January 1906 > given to Dewey (Geological Survey) > bought at Ancient and Oriental auction by British Museum (registered 1998)
Canterbury WGS 126 (MPS fig. 145, BM 1884,0322.13)	Smith > British Museum	Recovered by WGS 27 November 1879 > given to British Museum (registered 1884)
Barton Hill WGS No 11 (BM 2011,8109.146)	Evans > Smith > Sturge > British Museum	Given to WGS by Evans > sold to Sturge > bequeathed to British Museum

and the different relationships between individual collectors. For most of the dataset, there is little information on whether the artefacts were recovered personally by the collector, bought from workmen or acquired from other collectors. However, for 307 finds locations, there is information on transfers, whether bought or donated, between collectors. There are 99 relationships between collectors with 76 "donors or dealers" and 35 "receivers" with the major people shown in Tables 7–8.

The transfers are predominantly small-scale with only 11 collectors transferring more than 35 artefacts. The highest number of artefacts was passed on by Allen Brown via Lawrence to Sturge (see previous texts), these coming from 50 sites in west London and occasionally neighbouring counties. Worthington Smith was another prolific collector who mainly recovered the artefacts personally or from workmen (see previous texts). He sold or donated his material to a wider range of collectors, with the majority again going to Sturge and a significant number to Evans. Of the 35 receivers, only five acquired more than 35 artefacts. Sturge acquired 3980 artefacts from only 12 collectors

Table 7 The main collectors who donated or sold their collections showing the quantity of material and to whom it was passed on (dates of birth and death given where known)

Donors & dealers	Receivers	No. sites	Artefacts	Handaxes	Cores/ flakes	Levallois
Brown JA (b.1831–d.1903)	Sturge WA (b.1850–d.1919)	50	2146	867	880	399
	Evans JE (b.1823–d.1908)	3	3	0	0	0
Smith WG (b.1835–d.1917)	Sturge WA	23	1251	761	489	1
	Evans JE	40	143	103	37	3
	Greenhill JE (b.1840–d.1907)	1	2	1	1	0
	Trechmann CT (b.1885–d.1964)	1	2	0	2	0
	Burchell JPT (b.1924–d.1971)	1	1	0	1	0
Greenwell, W.	Evans JE	1	3	2	1	0
	Sturge WA	1	454	59	395	0
Elliot AR	Sturge WA	1	70	58	12	0
Prigg H (b.1838–d.1892)	Evans JE	18	59	47	10	2
Kitchin EH	Calkin JB (b.1892–d.1972)	2	90	30	60	0
Todd KRU (b.1905–d.1950)	Leighton R (b.1943–d.1972)	9	44	15	28	1
Evans JE	Calkin JB	1	40	0	36	4
Harrison B (b.1837–d.1921)	Evans JE	13	39	35	4	0
	Sturge WA	1	14	8	6	0
Medley HF	Faulkes	6	39	36	3	0
Latchmore F	Evans JE	5	14	10	3	1
	Ford JN	1	24	10	14	0
Total		178	4438	2042	1985	411

Table 8 The main collectors who received material showing the numbers of donors or sellers and the quantity of material

Receivers	No. original collectors	No. sites	Artefacts	Handaxes	Cores/flakes	Levallois
Sturge WA (b.1850–d.1919)	12	79	3980	1776	1803	401
Evans JE (b.1823–d.1908)	47	141	376	298	69	9
Leighton R (b.1943–d.2004)	3	20	83	28	54	1
Calkin JB (b.1892–d.1972)	2	3	130	30	96	4
Faulkes	1	6	39	36	3	0
Total	63	250	4608	2168	2025	415

from 79 different sites. In contrast, Evans bought or was given only 376 artefacts, but these came from 47 collectors and 141 sites (Table 8).

Analysing the Collectors

From the dataset of the original collectors and their collections, profiles can be developed of different collector types. The 40 collectors, who were responsible for over 90% of the artefacts in the dataset, have been divided into three broad collecting periods, when the majority of their collections were accumulated: 1860–1920; 1920–1960; and post-1960. A few (e.g. Warren) were active over more than one period, but they have been allocated according to when the majority of their material was recovered. Each collector in Table 9 has been assessed using the measures of quantity, geographical range, focus, selectivity and quality outlined previously and assigned to one of the five groups (Table 10).

Group 1 comprises Evans (Fig. 3a) and Sturge who operated on a national scale in the earlier years of the subject, with either large or important collections, which are dominated by handaxes and supported by a mixed archival record. They bought or were given artefacts as well as collecting their own (see subsequent text).

Group 2 collectors operated on a national or regional scale with large- to medium-size collections, good collecting habits and often excellent archive. They range from earlier collectors, such as Worthington Smith (Fig. 3b), to later collectors, such as Warren (Fig. 3c), Marston and Lacaille. Most of them published widely and contributed to the main debates of the time. By these measures, the personal collections of John Wymer (many inherited from his father B.O. Wymer) also fall into this group, although he is much better known for his large excavated assemblages from Swanscombe, Clacton and Hoxne, which are not considered here.

Group 3 comprises local and regional collectors with medium to small assemblages, generally good collecting and a mixed archival record. They operated from the late 19th century to recent decades and include Jennings who collected from the River Kennett sites on the Cambridgeshire–Suffolk border, Reid Moir in coastal Suffolk (Fig. 3d), Harrison on the North Kent Downs, Grace who collected at Swanscombe and Draper in the Solent Basin. More recently, there has been MacRae in Oxfordshire and Norfolk and Whitehead in Worcestershire. They occasionally published regionally important sites.

Table 9 The top 40 collectors showing the quantities of sites and artefacts organised into three chronological periods. Each is assessed according to quantity, range, focus and selectivity of collecting with an assessment of archive quality. See Table 4 and text for full explanation of assessment measures (H handaxe, F flake, C core, L Levallois)

Collector	Sites	*n*	Sqs	H/HFCL	*n*/site	Quantity	Range	Focus	Selectivity	Archive
1860–1920										
Brown JA	61	2272	8	41.9	37	Large	Regional	Med	Average	Good
Dale W	30	334	3	99.4	11	Medium	Local	Low	Poor	Poor
Evans JE	99	540	25	75.6	5	Medium	National	Low	Poor	Average
Flett J	1	101	1	35.6	101	Small	Local	High	Average	Poor
Greenwell W	8	475	1	15.8	59	Medium	Local	Med	Good	Poor
Harrison B	61	690	4	18.3	11	Medium	Local	Low	Good	Good
Jennings CR	10	170	1	32.9	17	Small	Local	Low	Good	Poor
Lewis H	5	139	1	97.8	28	Small	Local	Med	Poor	Poor
Rice RG	34	249	6	58.6	7	Small	Regional	Low	Average	Poor
Smith GW	56	721	2	87.2	13	Medium	Local	Low	Poor	Average
Smith WG	145	2911	18	55.6	20	Large	National	Med	Average[a]	Good
Spurrell FCJ	4	265	1	1.1	66	Small	Local	Med	Good	Good
Sturge WA	181	3604	25	68.1	20	Large	National	Med	Poor	Average
1920–1960										
Bean CE	1	1016	1	89.3	1016	Large	Local	High	Poor	Good
Bowes TA	25	1328	5	61.2	53	Large	Regional	Med	Average	Ave[b]
Burchell JPT	44	1714	7	9.1	39	Large	Regional	Med	Good	Good
Calkin JB	66	764	5	61.9	12	Medium	Regional	Low	Average	Good
Chandler RH	19	377	3	20.7	20	Medium	Local	Med	Good	Average
Cook WH	1	509	1	0.4	509	Medium	Local	High	Good	Good
Corner F	24	352	4	25.9	15	Medium	Local	Low	Good	Poor
Dewey H	31	179	7	48.0	6	Small	Regional	Low	Average	Good
Draper JC	9	122	1	21.3	14	Small	Local	Low	Good	Average
Grace R	4	206	2	33.0	51	Small	Local	Med	Good	Poor
Kennard AS	1	674	1	33.4	674	Medium	Local	High	Good	Good
Lacaille AD	31	1729	6	25.3	56	Large	Regional	Med	Good	Good
Marsden JG	9	219	2	38.4	24	Small	Local	Med	Average	Poor
Marston AT	21	8229	6	16.3	392	Large	Regional	High	Good	Good
Mogridge CJ	11	267	1	58.8	24	Small	Local	Med	Average	Average
Moir JR	30	289	8	12.8	10	Small	Regional	Low	Good	Good
Newton WM	5	124	1	33.1	25	Small	Local	Med	Good	Poor
Passmore AD	18	154	3	85.1	9	Small	Local	Low	Poor	Poor
Poole	1	153	1	31.4	153	Small	Local	High	Good	Poor
Sainty JE	6	148	1	4.1	25	Small	Local	Med	Good	Poor
Thompson RC	23	134	4	69.4	6	Small	Local	Low	Poor	Poor
Trechmann CT	32	133	6	91.7	4	Small	National	Low	Poor	Poor
Wade AG	15	143	1	82.5	10	Small	Local	Low	Poor	Poor

Table 9 (continued)

Collector	Sites	*n*	Sqs	H/HFCL	*n*/site	Quantity	Range	Focus	Selectivity	Archive
Warren SH	166	4561	24	16.9	27	Large	National	Med	Good	Good
Post-1960										
MacRae RJ	8	281	3	21.4	35	Small	Local	Med	Good	Good
Whitehead PF	7	194	1	27.3	28	Small	Local	Med	Good	Good
Wymer JJ	23	323	5	25.1	14	Medium	Regional	Low	Good	Good

[a] Does not include most of Luton Museum material, which has large numbers of flakes. Overall assessment is consequently given as good in Table 10

[b] Artefact provenance, originally on gummed labels in a curious code, largely lost during sea-floods of 1949 and 1953 when collection was housed at Herne Bay Museum

Table 10 The top 40 collectors organised into collecting group and by chronological period. The total number of artefacts that each group collected is also shown

Group	1860–1920	1920–1960	Post-1960	Artefacts
1. Important national collectors with large- to medium-size assemblages but dominated by handaxes and mixed archival record	Evans Sturge			4144
2. National and regional collectors with large to medium assemblages and good collecting, often with detailed archive	Brown Smith WG	Burchell Lacaille Marston Warren	Wymer	21,739
3. Local and regional collectors with medium to small assemblages with good collecting and mixed archival record	Greenwell Harrison Jennings Spurrell	Cook Corner Chandler Draper Grace Kennard Moir Newton Poole Sainty	MacRae Whitehead	5029
4. Local and regional collectors with medium to small assemblages with average collecting and mixed archival record	Flett Rice	Bowes Calkin Dewey Marsden Mogridge		3107
5. Local and regional collectors with mainly small- and medium-size assemblages. Predominantly handaxes with little archive	Dale Lewis Smith GW	Bean Passmore Thompson Trechmann Wade		2774

Group 4 collectors operated on local and regional scales with medium to small assemblages, but with average collecting and mixed archival record. The group includes Garraway Rice who mainly collected in London, Calkin who between the wars focussed on the pits and urban developments around Bournemouth (Fig. 3d) and Armstrong Bowes in north Kent.

Group 5 is comprised of collectors who had small- to medium-size collections of predominantly handaxes on a local or regional scale. They include G.W. Smith (Fig. 3d) from Middle Thames sites around Reading and Dale in Hampshire. Other collectors concentrated on single locations, such as Passmore at Knowle Farm in Wiltshire, Wade on the gravel pits at Farnham in Surrey and Bean who concentrated all his considerable efforts on the pits at Broom in Dorset (Hosfield 2009; Hosfield and Green 2013).

Unsurprisingly, there is a trend towards better collecting through time, although collectors from groups 2–5 are present in both the earlier periods. All the post-1960 collectors are in groups 2 or 3, but there are only three that are listed. The decline in collecting was due in part to full mechanisation of quarrying and the difficulties of acquiring material from quarry workers. Other factors may also have played a role, such as the decline of the "leisured classes" in the post-war years able to indulge their interests and the growth of archaeology as a formal discipline with more scientific research methods.

Of the five groups, group 2 is by far the most important for artefact numbers, and, fortunately, these collectors generally had the best collecting practices, usually with good archives. Group 3 also provided material of a higher standard, whilst group 1 had the breadth of coverage not achieved by the other groups. Taken together, groups 1 to 3 contribute 84% of the artefacts, which means that the majority of the dataset is the product of good collecting practices and provides a valuable resource for further study. By the very nature of collection as opposed to excavation, there was an inevitable bias towards handaxes; nonetheless, it forms a representative sample of these artefacts. In the instances where cores and flakes were also collected, they too provide material for qualitative comparisons between sites.

Discussion and Conclusions

Many of the current debates in European Palaeolithic archaeology focus on a number of "key" sites that inform understanding of the earliest occupation, human habitats and development of lithic and other technologies. Quite rightly, the highest quality information is required and the subject has moved forward due to better scrutiny and higher standards of evidence. At the same time, there has been a series of papers in the UK that have attempted to use, with due caution, the much wider range of evidence that resides in museums based on old collected assemblages, which have been summarised in national and regional gazetteers (Roe 1968; Wessex Archaeology, 1993a,b, 1994, 1996a,b, 1997). The non-excavated collections data has been used to try and understand broad-scale temporal and spatial patterns that reflect on the Palaeolithic occupation of Britain (Ashton and Lewis 2002; Ashton and Hosfield 2010; Ashton et al. 2011, 2015, 2018; Davis 2013; Bridgland and White 2015; White 2015). The current paper has taken a step back, as a health-check, to specifically address how this large body of data can be

critically used, examining in more detail the effect of collection history on the recovery and composition of the assemblages.

As long recognised, the majority of collecting took place in southern and eastern parts of England, where the flint-rich resources facilitated the creation of artefacts that are more easily recognisable than those made of other raw materials. These areas have also been less prone to the destructive processes of glaciation, particularly after MIS 12. The vast majority of early collecting was focussed on sand and gravel quarries, and, therefore, there is a further bias in the record towards fluvial contexts.

The study has also shown the clear selectivity towards handaxes to the detriment of representative samples of non-handaxe material. However, by analysing the collectors, it is clear that 90% of the dataset was accumulated by 40 (out of 425) collectors, 34 of whom (84%) can be considered to have collected more carefully. This means that some 31,000 artefacts (including c. 9200 handaxes) from 664 locations can be used in a structured way to answer broad-scale questions about the early Palaeolithic.

Two recent examples show how the critical use of old collections can contribute new dimensions to Palaeolithic research. One study has examined the differences in distribution of Lower Palaeolithic and Early Middle Palaeolithic populations, using handaxes and Levallois artefacts as proxies for the different periods in Britain (Ashton et al. 2018). This study used a combination of analyses to account for the bias towards handaxes and concluded that there were higher than expected numbers of Levallois artefacts in the lower reaches of south-eastern rivers, particularly the Thames. It was suggested that this reflected an incursion into south-east England by Early Middle Palaeolithic populations during early MIS 7, but this was short-lived perhaps due to the increasing isolation of Britain.

A different series of studies, based mainly on old collections, have suggested chronological changes in handaxe form with distinctions in the morphology and technology between sites attributed to MIS 13, MIS 11 and MIS 9 (Davis 2013; Bridgland and White 2015; White 2015; Ashton 2016; White et al. in press). Some of the differences have been argued to represent distinct cultural groups entering Britain that can be related to population shifts due to changing climate.

In both these examples, the interpretations have been based on the study of old collections, but in conjunction with a better understanding of their context. Much of the work of the Ancient Human Occupation of Britain project (Stringer 2005), the Solent River Palaeolithic Project (Davis 2013; Hatch 2014; Davis et al. 2016; Hatch et al. 2017) and, most recently, the Breckland Palaeolithic Project (Davis et al. 2017) has concerned the stratigraphical, chronological and environmental contexts of old collections. In each case, a deeper understanding of the collection context has enabled old sites to be drawn into modern research and interpretation.

Other European countries have comparable collections and histories of research from the earliest years of the subject. In France, among many significant figures were Boucher de Perthes and later Victor Commont in the Somme Valley or Henry Christy with Edouard Lartet in the Dordogne caves. In Belgium, Edouard Dupont was the first to explore the Palaeolithic remains of the caves of the Ardennes. As in Britain, amateur societies flourished, collecting was widespread and the resulting artefacts accumulated in private hands or were transferred to local, regional and national museums. There are, however, three key contrasts with Britain. The Palaeolithic record from Britain is

dominated by material from the fluvial networks of southern and eastern England, where large-scale gravel extraction was pivotal in the formation of the archaeological archive. This regional character also led to its eventual curation in a limited number of museums, with a large proportion housed at the BM. Critically, these circumstances facilitated the compilation of a nationwide gazetteer by Derek Roe (1968), which in turn underpinned The English Rivers Palaeolithic Survey (Wymer 1999). This data, which is now in digital form (Mepham 2009), has been fundamental to the *Mapping Palaeolithic Britain* project and other similar research.

This paper demonstrates that understanding collection history is essential for the study of the Palaeolithic today. In the first few decades after 1859, Britain was at the forefront of research when the archaeological, anthropological, geological and biological questions were first being addressed and many of the methods of enquiry were developed. The paper also shows that historic collections can still have great value for current research. Whereas modern excavations provide a sharp focus on fine-grained behavioural issues and the environments in which humans lived, the old collections, due to their size and geographical range, can provide a broader view on material culture, population dynamics and Britain's relationship to mainland Europe during the early Palaeolithic.

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Compliance with Ethical Standards

Conflict of Interests On behalf of all authors, the corresponding author states that there is no conflict of interest.

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