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Authentication or Appropriation?

An evaluation of the contributions made by Sir Charles Lyell to the human antiquity debate and the development of prehistoric archaeology

by

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Abstract

Sir Charles Lyell's last major published work, *The Geological Evidence of the Antiquity of Man*, is a publication which has been subject to criticism upon its release and by modern historians (Bynum 1984, 153). Claims of Lyell's illegitimate acquisition of results from appropriating other researchers work, made it necessary to evaluate these claims before assessing the contributions Lyell made to the human antiquity debate and the development of prehistoric archaeology. Lyell's known contributions are assessed through comparison to the work of other contemporary researchers. To aid in the current understanding of Lyell's contributions and claims of plagiarism, the objects, notebooks, and correspondence from the Sir Charles Lyell Collection (The University of Edinburgh) were evaluated in this paper through primary source analysis and the creation of object biographies. The correspondence with Pengelly and Morlot showed that Lyell did not maliciously appropriate the research of Falconer and Lubbock. With that being said Lyell did not acquire his information through his own research and relied heavily on the work of others. Through creating object biographies, two of the figured illustrations from the Somme valley used in ...*Antiquity of Man* have been successfully matched with objects held in the collection. The direct use of these by Lyell, made it possible to assess his exact archaeological interpretations which presented no new information or developments in prehistoric archaeology that had not already been conveyed by Evans. Lyell's main role in the acceptance of human antiquity was supplying authentication to other researchers work through his established authority and by presenting their arguments in a powerfully written narrative which was able to persuade fellow scientists and the public.

Chapter 1. Introduction

Sir Charles Lyell, Figure 1, was born at Kinnordy House in Scotland on the 14th of November 1797 (Bailey, 1962, 1). The same year as the death of the geologist, and Lyell's biggest influence, James Hutton. After graduating with a degree in classics from Oxford University, Lyell had a brief career in law. However, Lyell was more interested in geology and by 1826 had abandoned law and published his first geological paper on the formation of freshwater limestone in Forfarshire. Lyell developed and worked out the ideas proposed by Hutton and in a few years published his *Principles of Geology* (1830-33). Historically viewed by some as "perhaps the most important scientific textbook ever written" Lyell revolutionised the tone of thinking about deep time with his theory of uniformitarianism (Gould, 2000). As Charles Darwin voyaged around the world on the *Beagle*, he carried with him a copy of *Principles* as his guidebook which greatly influenced and informed the development of his theory of evolution by natural selection (Secord, 2014, 138). With his research work of *Principles*, Lyell contributed massively to the development of geology, however the same might not be so easily said of his later contributions to prehistoric archaeology and the human antiquity debate. Starting with the finds in caves of primitive human skulls in Engis, Liege in 1833 and in Neander Valley, Dusseldorf in 1856, Lyell began to question a human antiquity period. After finds of human made flint tools with the remains of extinct mammalia at Brixham Cave in 1858 and the similar finds in the Somme valley in the spring of 1859, Lyell was fully convinced. This is highlighted in his opening

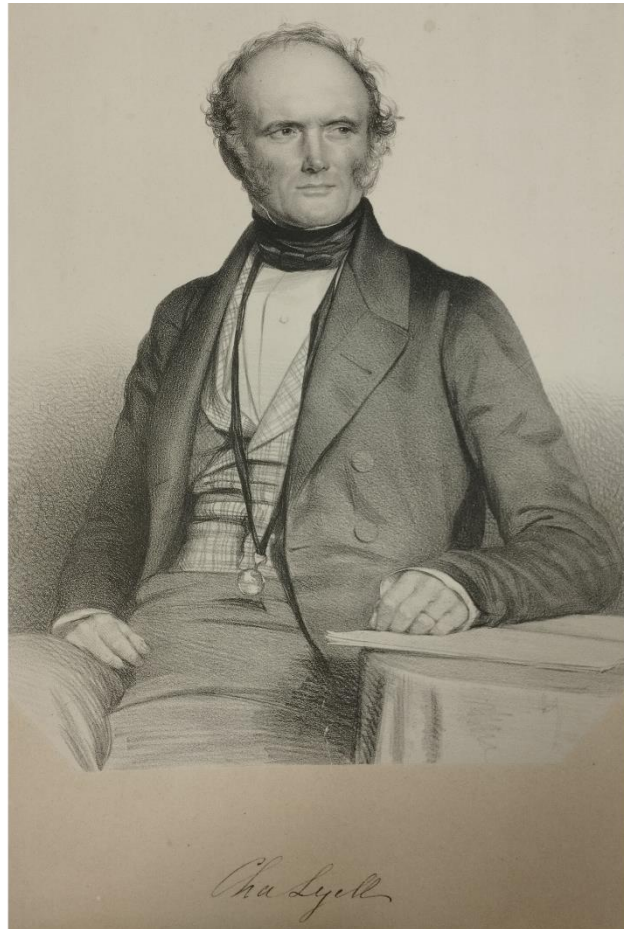


Figure 1. Photograph by Adams (2023) of a drawn portrait of Sir Charles Lyell 1797-1875

address at meeting of the British Association for the Advancement of Science in Aberdeen on the 16 September 1859, where Lyell states:

“I believe the antiquity of the Abbeville and Amiens flint instruments to be great indeed if compared to the times of history or tradition” (Lyell, 1859).

In November of the same year Darwin published his *On the Origin of Species* (1859). From these developments Lyell conducted his own research into human antiquity and flint implements by gathering evidence to support his views. Lyell published this research in his last major work, *The Geological Evidence of the Antiquity of Man* (1863), seen in Figure 2, which

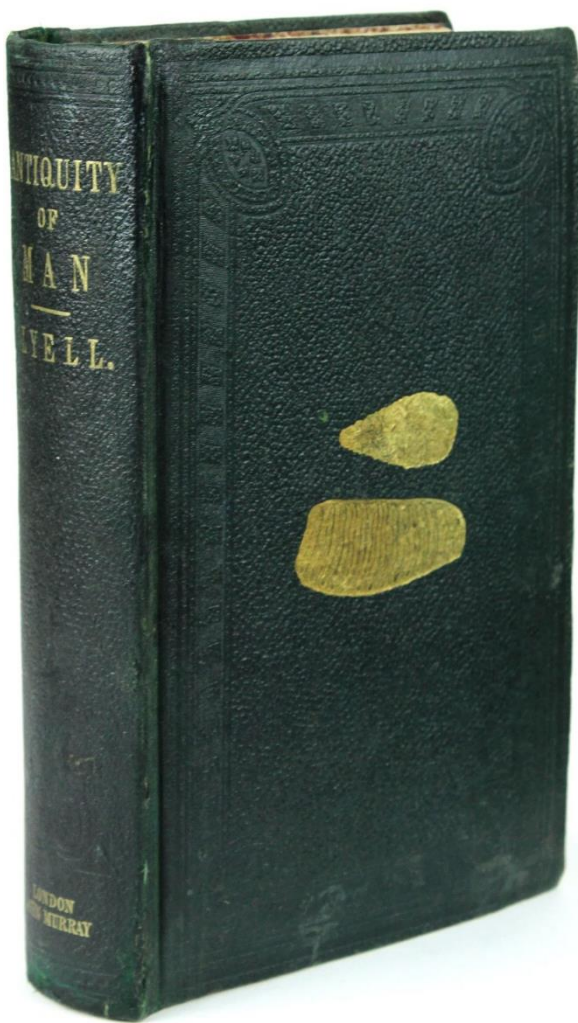


Figure 2. Original cover of ...Antiquity of Man showing a mammoth molar and a flint implement together (Lyell, 1863)

had huge public success with almost all of the 4000 copies sold in its first week of publication (Cohen, 1998, 90). However, ...*Antiquity of Man* had some critics upon its publication notably Darwin, who was disappointed in Lyell's lack of support for his theory of evolution by natural selection. Other critics include Hugh Falconer and Joseph Prestwich who were dissatisfied with the way in which Lyell chose to report the research of others especially the Brixham Cave evidence. When John Lubbock released his *Prehistoric Times* (1865) he publicly accused Lyell of plagiarising his previous papers on Danish Kitchen Middens and Swiss Lake Dwellings. This has led some scholars to question Lyell's role in the human antiquity debate and conclude that he appropriated other researchers' work (Bynum, 1984; Cohen 1998). Wilson's (1998; 2002) research into Lyell's private correspondence was able to show that the accusers were in fact in the wrong. However, it is still uncertain of Lyell's intentions in publishing other people's work. In this paper the University

of Edinburgh's collection of the private correspondence between Lyell and some of the researchers who contributed to ...*Antiquity of Man* will be analysed in an attempt to assess and

quantify Lyell's plagiarism. The recently acquired collection of Lyell's 294 Notebooks will also be examined to see if they can reveal any more information. Whether Lyell authenticated or appropriated others research is important to assess before evaluating his contributions to the human antiquity debate and the development of prehistoric archaeology. Lyell's contributions will be assessed through creating object biographies of six of Lyell's flint implements also held by the University of Edinburgh in the Vere Gordon Childe Collection and The Cockburn Geological Museum. What Lyell learned from the archaeological study of these different types of flint implements will be evaluated by cross referencing with his correspondence, notebooks, and publications. Through the methods adopted for this research paper, Lyell's role in the development of prehistoric archaeology and the antiquity debate can be better assessed and may show that he went beyond the authentication of other's work.

Chapter 2. Literature Review

Uniformitarianism and the Issues of Ethnoarchaeology

Sir Charles Lyell (1830-1833) set out in his *Principles of Geology* to identify observable processes that could be used to explain geological phenomena. Lyell proposed that glaciation



Figure 3. Pillars of the Temple of Serapis which Lyell used as evidence to prove the theory of uniformitarianism (Lyell, 1830-33)

events and volcanic activity could not only explain existing geological formations as well as the earth's geological history, but that such theories could be tested. Since geological forces have been uniform in process and result, those observed in the present can be used to explain the past, as demonstrated in Figure 3 (Lyell, 1830-33). His application of uniformitarianism to the geological period helped demonstrate deep time and offered an alternative explanation to those who believed the earth was shaped by biblical catastrophes and was an essential component in influencing Darwin's theory of evolution by natural selection and was a catalyst for the human antiquity debate (Canon, 1960, 38).

Many archaeologists call on the application of uniformitarianism in order to invoke a 'scientific basis' for their use of ethnographic analogies to help explain the archaeological record (Cameron, 1993). As explained in a cyclical arrangement in Figure 4, the idea that the earth has always changed in uniform processes means that the present is key in understanding the past (French & Chamberlain, 2021, 2).

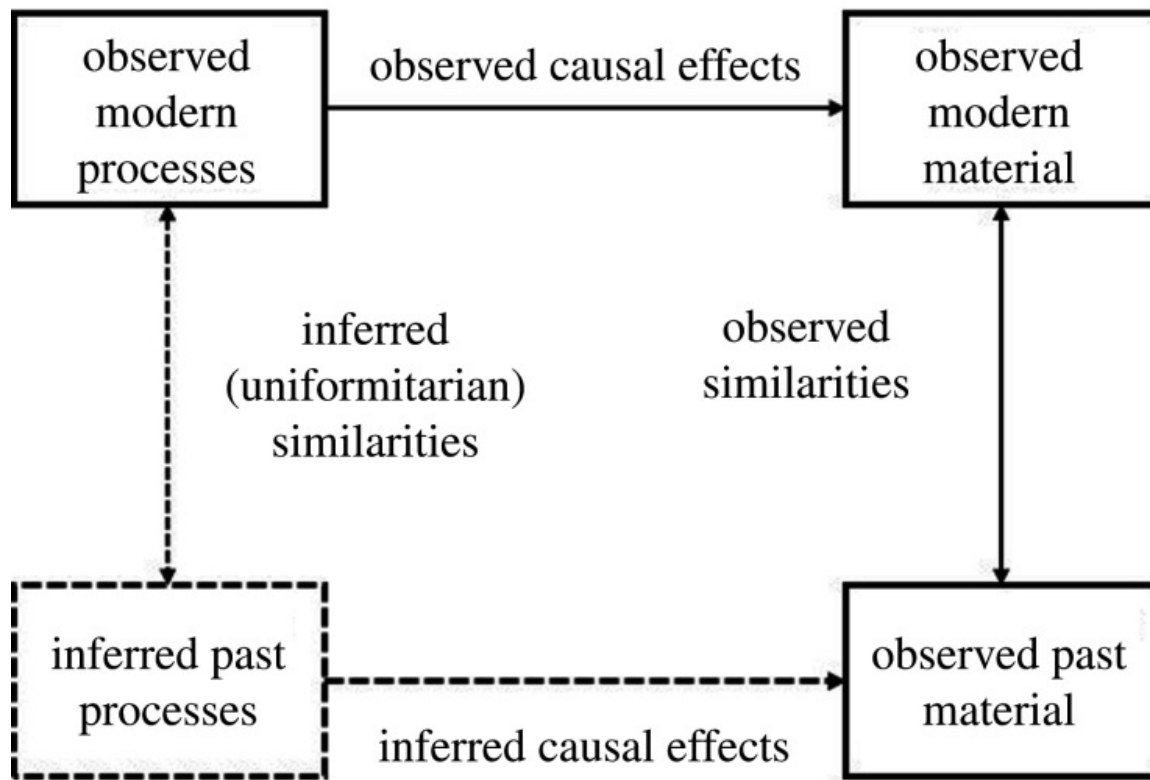


Figure 4. The application of uniformitarianism to modern and ancient materials (French & Chamberlain, 2021, 2)

However, Cameron (1993) disagreed that uniformitarianism could be applied to the study of prehistory in the same way as geology. Much of the debate concerning the use of uniformitarianism within archaeology is due to the general use of the term 'uniformitarianism' without defining the distinct principles within this term. It is the current lack of understanding of the substantive, methodological and associative uniformitarian principles that has resulted in much of the current confusion regarding the use, or misuse, of analogies within archaeology (Cameron, 1993, 48). Furthermore, as explained by Gosselain (2016, 215) ethnoarchaeological analysis is a methodology of the twentieth century and carries with it racist implications in allowing for the comparison of “exotic” contemporary societies with modern western societies which should be seen today as an inaccurate comparison. Furthermore, the focus solely on comparison of material culture is limiting compared to methods used by anthropologists. Overall, Lyell’s (1830-1833) principle of uniformitarianism helped in acting as a catalyst for the study of deep time, without this way of thinking, further developments in prehistory and therefore prehistoric archaeology would not be possible. The application of uniformitarian ideas to ethnography is however questionable, although it is a methodology used in prehistoric archaeology it may not be an accurate analogy to the study of prehistoric artefacts and people.

Neanderthals: Engis and Feldhofer skulls

Dr Phillippe Schmerling's finds in caverns near Liège, Belgium, from 1829-1833 were of significance to the antiquity debate (Shorr, 1935, 435). Schmerling found human fossils amongst flint implements and cut bone in the same debris with the remains of extinct mammals (Schmerling, 1833-1834). In Lyell's initial evaluation of this evidence, he dismissed them and still expressed doubt as to man's contemporaneity with the extinct mammals (Shorr, 1935, 435). This was because Liege is a cave site and the fossils could have been disturbed by taphonomic conditions, providing erroneous results (Cohen, 1998, 84). Although Schmerling had not found the human bones in a condition favourable for classification he was certain of his ground and believed he had found sufficient evidence of man's existence in antiquity and continued his work in Liege until his death in 1836. Had he been alive over the following decades to see his research become corroborated by French, German and British finds he may have been a key authority in proving antiquity and the development of prehistoric archaeology. In *...Antiquity of Man*, Lyell re-evaluates his opinions on Schmerling's evidence and revisits the Liege caverns and in particular the fossilised child skull of Engis Cave and uses this evidence to support his interpretations on prehistoric people (Lyell, 1863, 61). This particular skull would eventually go on to be identified as the skull of a *Homo neanderthalensis* in 1936, making it the first Neanderthal ever found, but only realised over one hundred years later, and not by Lyell.

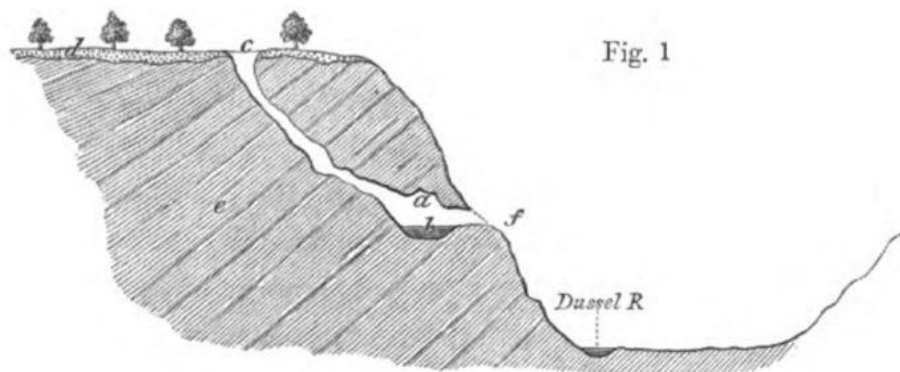


Figure 5. A section of the Kleine Feldhofer Grotte, near Dusseldorf, used by Lyell (Lyell, 1863, 59)

When found by quarry workers in 1856, the remains of Neanderthal 1 was believed to be that of a large mammal such as a cave bear, but it was through the eyes of specialists, Johann Fuhlrott and Hermann Schaafhausen, who recognised the remains as ape-like and considered them an ancestor of modern humans. Lyell travelled to the site in 1858 and confirmed the discovery of a fossil human skeleton and conducted his own explorations of Feldhofer Klein

Grotte, a section of which can be seen above in Figure 5 (Lyell, 1863, 59). Lyell reported this information on the find to Dr Hugh Falconer who wrote back to Lyell in August 1858 stating:

"I [Falconer] would have put it in the bundle with mummy wheat, the Sea Serpent, and live frogs of existing species hopping out of palaeozoic rocks, but you are a practiced authority in sifting evidence of this nature and I do not see well how there can be any concealed source of error" (Wilson, 2002, 81)

This shows how Lyell's authority in the scientific community could help in proving evidence. A large part of Lyell's bioarchaeological analysis of the morphology of the bones published in ...*Antiquity of Man* is based on the observations made by Thomas Henry Huxley and from

page 62-70 Lyell reprints the exact words of Huxley (Lyell, 1863). Huxley's illustrations of the Neanderthal I skeleton are visible in Figure 6 (Huxley, 1863). Lyell then goes on to use this to support Lamarck's hypothesis of transmutation (Lyell, 1863, 71). In these two examples one can see Lyell's early involvement in the human antiquity debate through his own personal assessment of evidence through visits, however from Lyell's consulting with mammalian palaeontologists such as Falconer and Huxley and his complete reliance on interpretation from the latter, Lyell's role is predominantly an authoritative one and offers little of his own research to the debate.

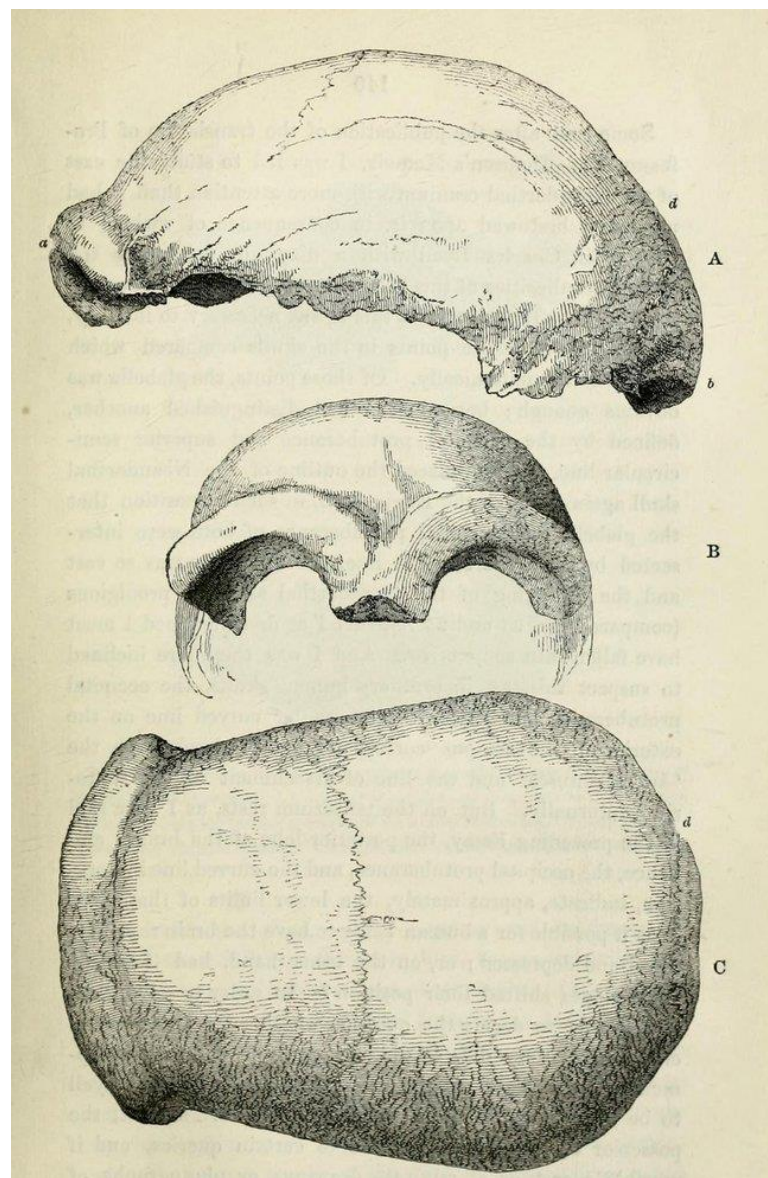


Figure 6. Huxley's illustrations of the skull cap (calotte) of Neanderthal 1 (Huxley, 1863)

Shattering the Time Barrier: The Valley of the Somme

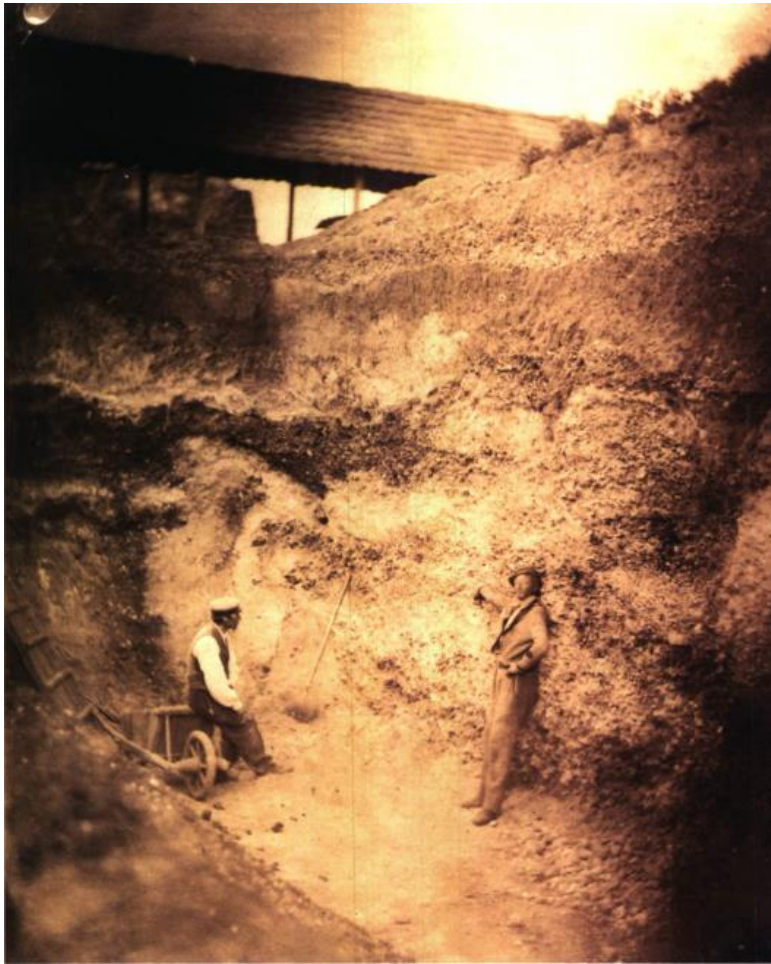


Figure 7. French workmen stand next to flint implement in pit St Acheul on the 27th April 1859, giving scale and showing the find in the stratigraphy, taken by Charles Pinsard, (held in collections of The Geological Society)

The notion that the earth had a history before Archbishop James Ussher's proposed date of creation, 4004 BCE, could not have been realised without the find of an in-situ flint hand axe in St Acheul on the 27th of April 1859 and the work of Joseph Prestwich and John Evans in authenticating it, a photograph of the find is visible in Figure 7 above (The Geological Society). Gamble and Kruszynski's (2009, 494) specifically focus on Prestwich and Evans' contribution and their importance in authenticating the twenty-two years of research of Boucher de Perthes on flint implements of the Valley of the Somme. They also use the scientific notebooks and correspondence of Charles Pinsard and Dr Hugh Falconer to establish an accurate chronology of the events since they believe that what is "well known" is not always "well understood" (Gamble & Kruszynski, 2009, 463). In doing so they reveal that Lyell was not present on the 27th April 1859 excavation of St Acheul, contrary to popular opinion (Bahn, 1996, 85; Gamble & Kruszynski, 2009, 463). Gamble and Kruszynski (2009, 463) also champion Prestwich and Evans in establishing human antiquity by developing procedures to authenticate archaeological observations which would later become the basis of prehistoric archaeology.

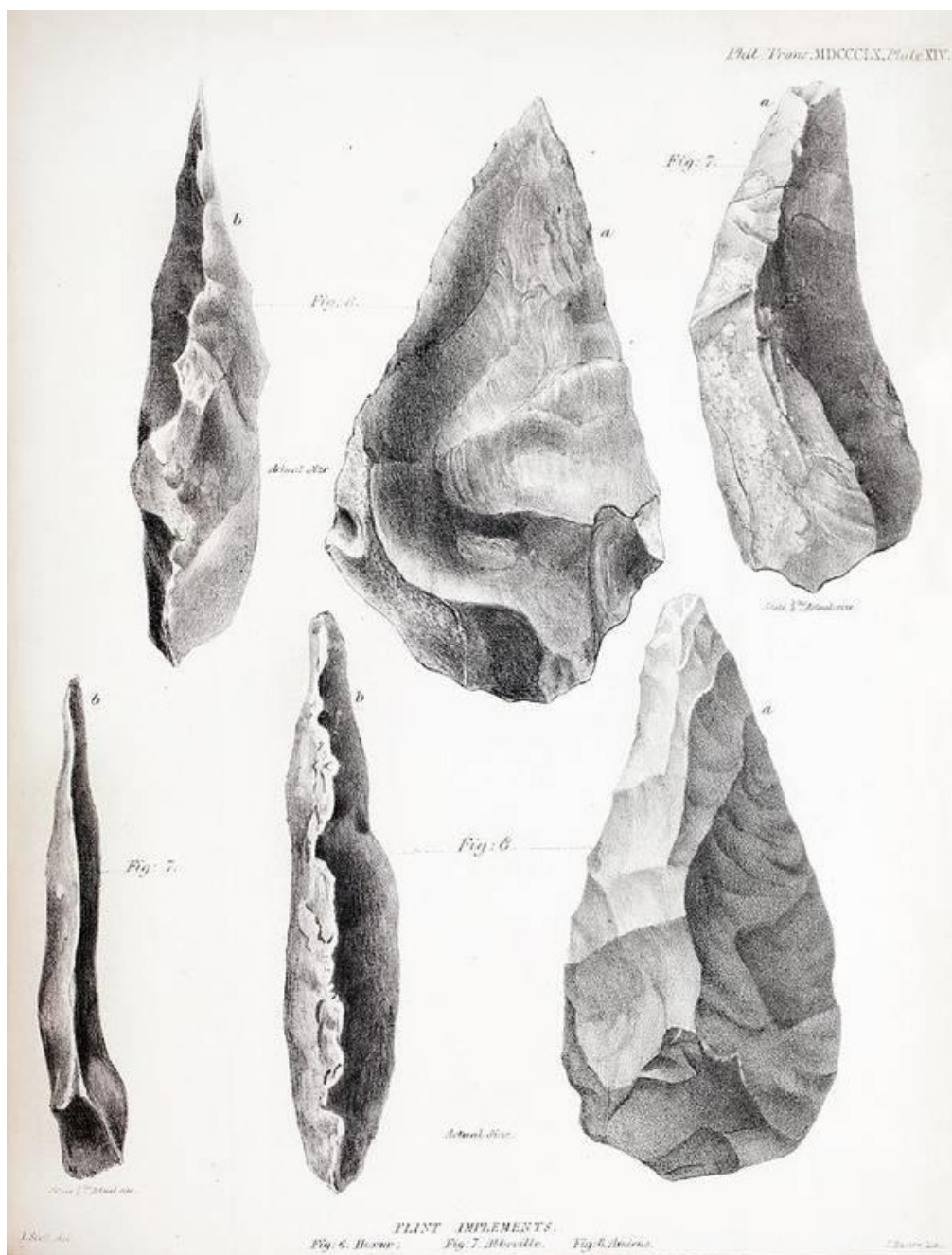


Figure 8. Plate XIV from Prestwich's 1860 report on the Somme valley and Hoxne (Prestwich, 1860)

However, one could argue that it was the work of Evans that resembled the work of modern prehistoric archaeologists and Prestwich's contribution was more authoritative than research-based, much like Lyell. Although Prestwich was convinced of human antiquity since the finds at Brixham Cave and investigated the Valley of the Somme, this was mainly just to witness Boucher de Perthes' collection of flint implements with his own eyes after Falconer's report. Prestwich's paper (1860) was a well-written and convincing account of flints from the Valley of the Somme with a focus on the stratigraphic relationships and includes some high detailed archaeological illustrations, seen in a plate in Figure 8. However, it was Evans who worked hard

archaeologically to classify stone tools from Abbeville by studying them and attempting to replicate the manufacturing techniques in an effort to help sway opinions and build up a greater body of corroborative evidence through conducting excavations in Britain. Evans (1863) used visual means of archaeological illustrations, in Figure 9, and the demonstration of lithic fracture physics to show how the flints had been altered intentionally by human hands in his report. He also immediately sought out corroborating evidence and examined John Frere's 1797 letter to the Royal Society concerning the flint implements found in Hoxne, Suffolk. Evans then led an excavation with Prestwich at Hoxne and found similar human-made flint implements present with extinct Mammalia.

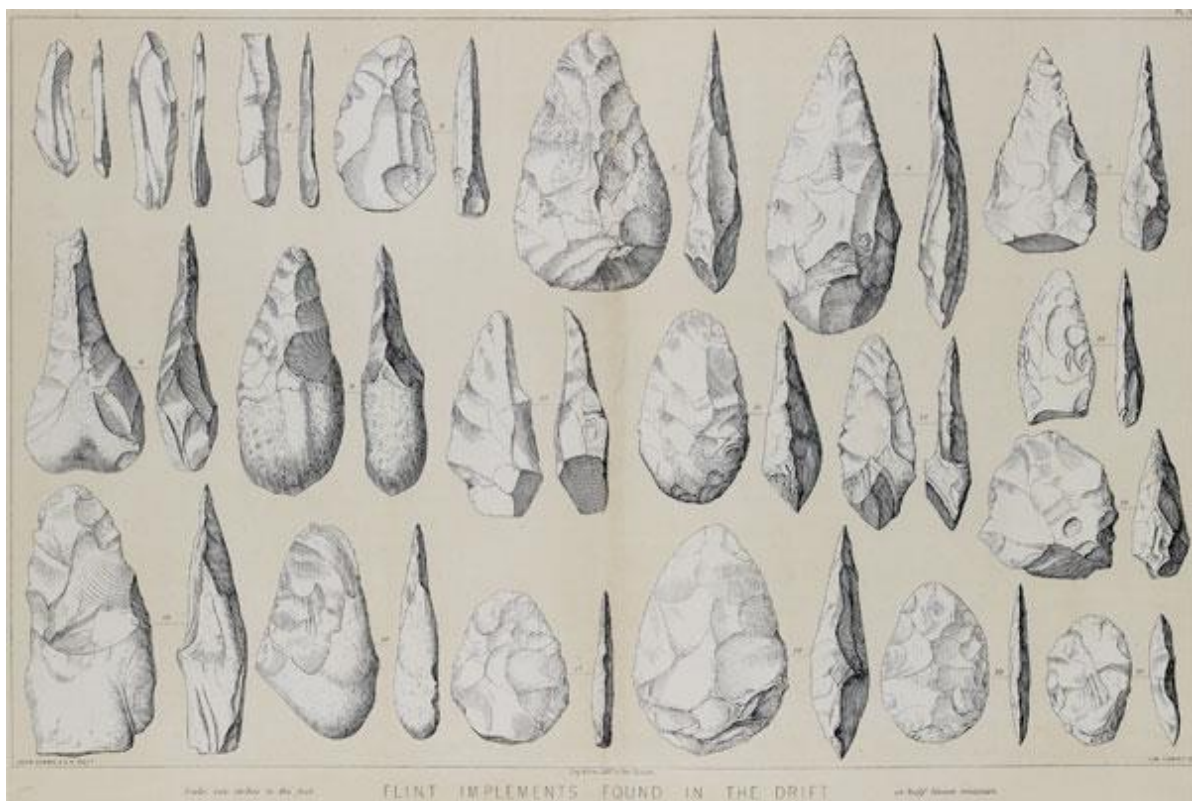


Figure 9. Archaeological illustrations by John Evans demonstrating his attention to detail and appreciation of different types of flint implements based on their morphology (Evans, 1863, Plate I)

Although Prestwich had an obvious involvement in the excavations and had a valuable role in authenticating the research of French scientists prior to 1859 to the members of the Royal Society, it was Evans, the archaeologist, who used innovative observational methods to extend the experience of discovery by visual means and continued to work hard to find the unmistakable corroborative evidence after 1859, Figure 10 shows the sites on a map reported to the Society of Antiquaries on 16th May 1861 where Evans discovered hand axes (Adams, 2023; McNabb, 2012, 44). Overall, the work of both Evans and Prestwich were crucial in the

acceptance of human antiquity, however it was Evans' methods which highlighted the benefits of archaeological analysis and helped to develop prehistoric archaeology further. Research into Evans' correspondence with Lyell will show how Evans was thinking archaeologically about the implements themselves and how to prove that the implements were ancient, instead of focusing on the relation of the implements to extinct bivalves and Mammalia.

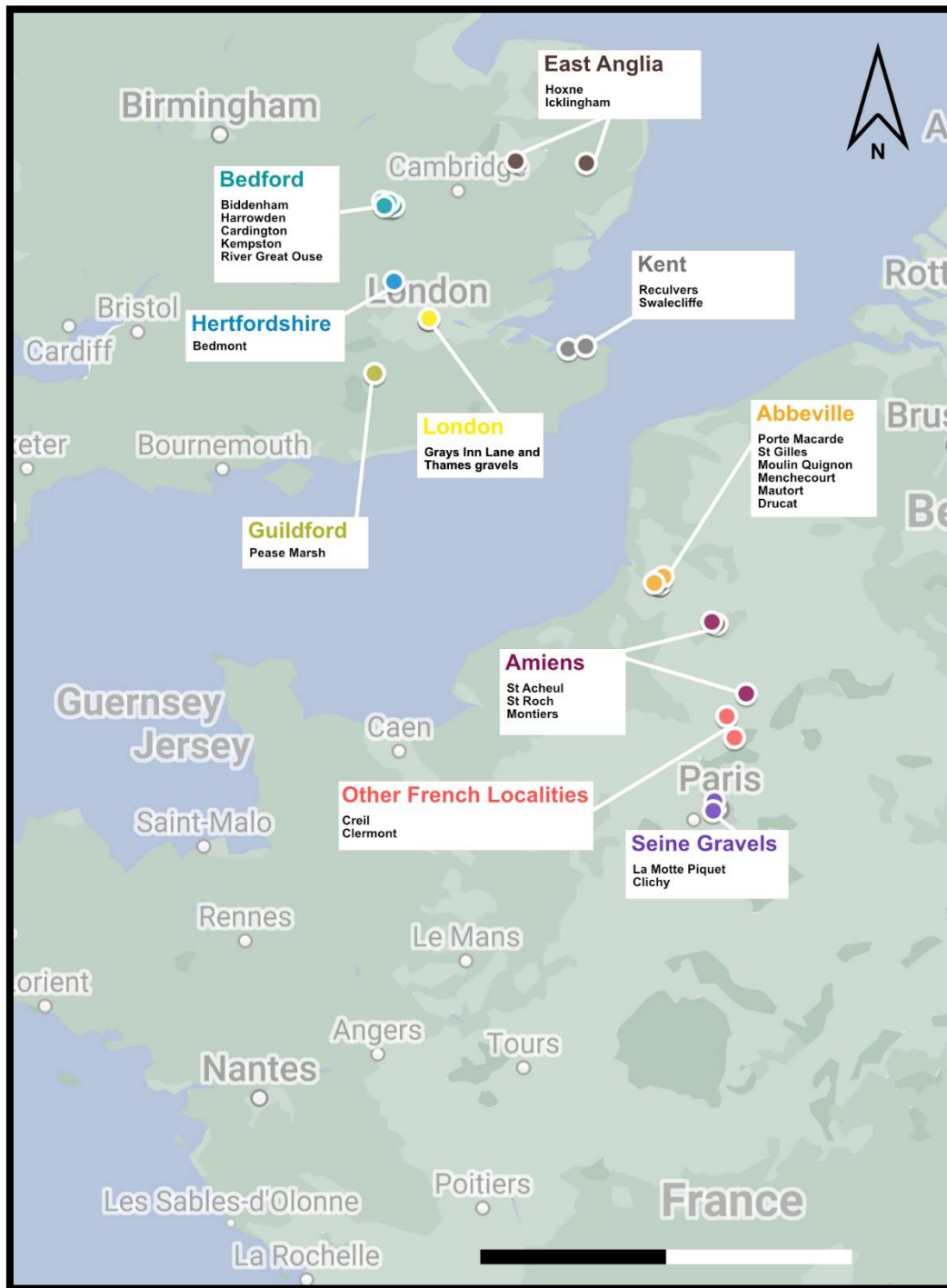


Figure 10. Map by Adams (2023) of sites visited by Evans to corroborate the St Acheul find, then reported to the Society of Antiquaries (adapted from McNabb, 2012, 44)

In their efforts to highlight the importance of Prestwich and Evans in the human antiquity debate, Gamble and Kruszynski (2009) soften the contributions made by other archaeologists and palaeontologists at the time. One of the photographs used in their paper, below in Figure 11, was taken at the April 27th 1859 St Acheul excavation by Pinsard, and provided primary evidence of the in situ find (Gamble & Kruszynski, 2009, 467).

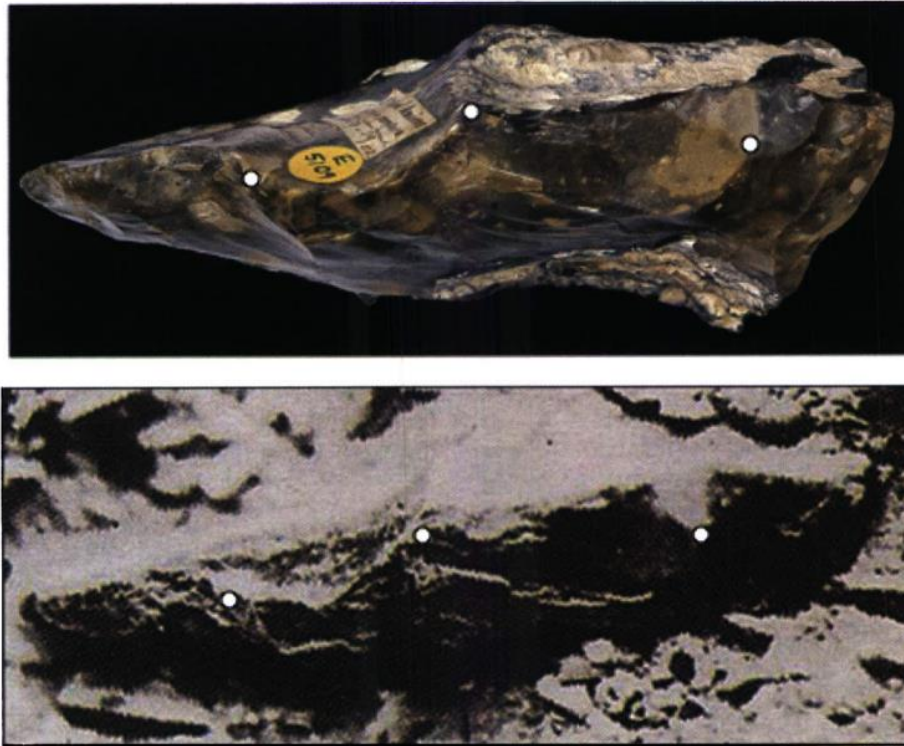


Figure 11. Photograph of the in situ flint implement from the 27 April 1859 excavation in St Acheul taken by Charles Pinsard, compared to an object in the Prestwich collection using correspondence points, proving they match (Gamble & Kruszynski, 2009, 467)

Gamble and Kruszynski also gloss over the importance of the research of William Pengelly in excavations at Brixham Cave, Torquay. Pengelly first heard of the cave in January 1858, and reported abundant mammoth remains to the Torquay Natural History Society which caught the interest of Falconer in April of the same year (Wilson, 1996, 89). Excavations of the cave finally began in July after an assessment from Prestwich, Lyell, Godwin-Austen and Ramsay which considered the cave important for the study of human antiquity. Pengelly led the excavations until September 1858 and reported finds of flint knives below the depth of reindeer antlers fixed with fossilised remains of extinct animals such as rhinoceros, hyena, and cave bear. Pengelly interpreted these flint knives as made by humans and suggested prehistoric man's contemporaneity with the extinct cave mammals, illustrations by Evans of these flint knives in Pengelly's report are seen below in Figure 12 (Pengelly, 1873, 550).

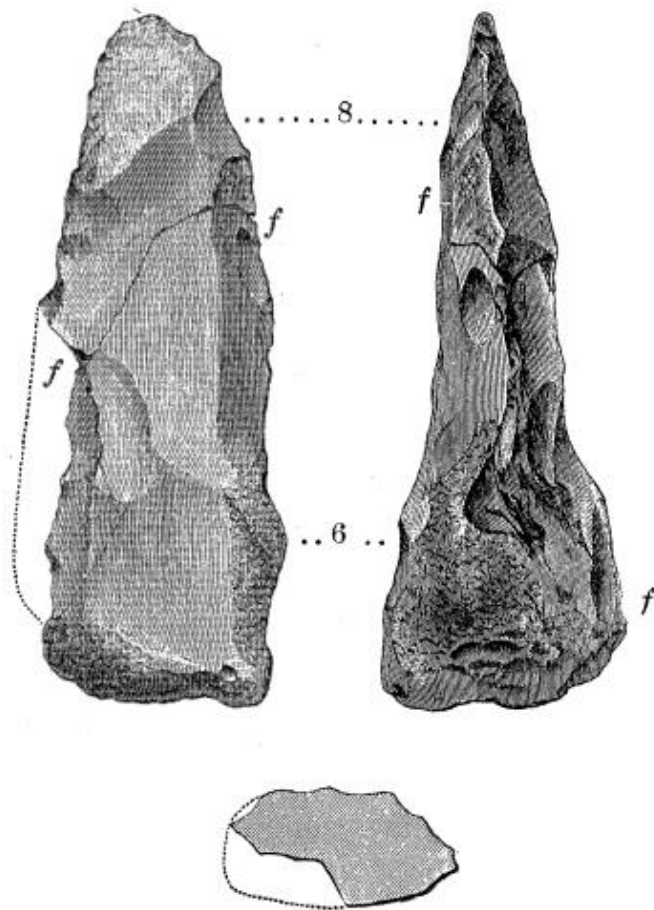


Figure 12. Archaeological illustration by Evans of flint knife found at Brixham, included in Pengelly's report (Pengelly, 1873, 550)

Falconer was convinced of the Brixham Cave evidence and decided to research human antiquity further with travels to cave sites in Sicily in November 1858. On the way, he met with Boucher de Perthes in Abbeville to examine his collection of flint implements and bones from the Valley of the Somme. Falconer's authentication of Boucher de Perthes' collection made a cautious Prestwich arrange a meeting in late April 1859 in Abbeville with the other society members to find 'unmistakeable corroboration' of human antiquity (Gamble & Kruszynski, 2009, 465). From Pengelly's cave explorations and Falconer's efforts in authentication, a human antiquity period was becoming better proven and without these developments Prestwich and Evans' "time-shattering" find in April 1859

may not have happened. Furthermore, had it not been for the photographic evidence of the event supplied by Pinsard, it would have been difficult to prove exactly what they saw at St. Acheul. By including the finds at Brixham Cave as being of similar importance to St Acheul it adds strength to Lyell's early contribution to the antiquity debate by his presence at both sites and providing further authentication of the evidence. Research into Lyell's notebooks and correspondence with Prestwich, Evans, Falconer and Pengelly will reveal more about his thoughts on human antiquity during the excavations of Brixham Cave and the Somme valley.

Lyell's Post-Publication Controversy

The contribution made by Lyell to the acceptance of antiquity and the development of prehistoric archaeology is a point of contention amongst scholars (Cohen, 1998; Bynum, 1984). Claudine Cohen (1998, 83) aims to underline the importance of *...Antiquity of Man* by

stressing the importance of Lyell in proving antiquity through the contemporaneity of flint tools with extinct shells and fossil bones. However, as we have seen, scientists had previously engaged in the same research prior to Lyell's publication, so Lyell's interpretations are nothing novel at this point. Cohen's other main argument involves the role Lyell's authority played in validating the authenticity of evidence found by French archaeologists and 'other amateurs' and through his publications made prehistoric knowledge accessible to the wider public audience. There is truth to this argument, by 1859 Lyell was an internationally well-respected and powerful geologist and communicator of science. The role his influence and authority played in convincing the public with his book and the British Association in a meeting in Aberdeen on the 16 September 1859 should therefore not be glossed over.

Bynum (1984) highlights the critics of Lyell and *...Antiquity of Man* and argues that instead of authenticating the work of his fellow researchers he appropriated their research and failed to give proper credit. As we have previously seen Falconer and Prestwich were very much involved in the human antiquity debate before the 1859 discovery through Brixham Cave explorations. Lyell chose to report on Brixham Cave in his *...Antiquity of Man* to support his arguments, however, Prestwich and Falconer were unsatisfied with Lyell's report of "their" work. Falconer believed that Lyell had appropriated credit for his research and chose to complain publicly in an issue of the *Athenaeum* (Bynum, 1884, 159). Other than not citing previously published works, he believed Lyell softened the interpretative contributions made by him and presented the interpretations as his own. Falconer viewed the publication as an egocentric compilation of other researcher's work which contributed to Lyell's own acceptance of antiquity. This is possible, as Lyell states "they wanted to gain from me, in as few words as possible, what my own conclusions were after reading what others had written, and after examining myself the clearest sections I could get access to" (Bynum, 1984, 166). This shows that Lyell believed he had a duty to present the research to the wider public audience in an accessible and compelling way. Although this may be true, Lyell still gave a concise and generous account of Brixham Cave referring numerous times to Falconer and Prestwich, often in complimentary terms, and had cited their published papers (Lyell, 1863). Wilson (1998) dismantles Falconer's (and Bynum's) arguments through analysis of the correspondence between Lyell and Pengelly. In their letters, Pengelly gives his full support to Lyell after Falconer's attack and offers his account of the Brixham Cave explorations and aftermath. Wilson argues that the delay in publication of the Brixham results was due to Prestwich and Falconer delaying Pengelly's report to be published after Prestwich's St. Acheul report and with

Falconer's account and his additional work in Sicilian caves. Overall, it seems that Falconer and Prestwich's dissatisfaction had more to do with Lyell's accurate inclusion of Pengelly's role at Brixham Cave. Perhaps they had planned to delay the publication of Pengelly's Brixham Cave report until they had completed the corroboration in Abbeville and Sicily to allow for a more convincing argument of human antiquity. However, some evidence suggests a political alliance between Prestwich and Falconer against Pengelly to allow themselves to receive the full credit of pioneering human antiquity discoveries at Brixham Cave, St Acheul and Sicily. This is suggested by letters from Prestwich to Pengelly where he urged him not to report on the results of Brixham Cave at an evening lecture at the Royal Institution in London on May 1859 (Wilson, 1998, 83). Furthermore, Prestwich (1873) neglected much of Pengelly's contributions, and exaggerated Falconer's in his account of the Brixham Cave results. Lyell on the other hand, sought to share an accurate narrative of the events as soon as possible and was nonplussed by the delay of the report (Wilson, 1998, 85). Overall, it seems Lyell did not appropriate Falconer, Prestwich or Pengelly and instead viewed the results as too important to not be included in providing evidence for human antiquity. His publication of the Brixham evidence represents an urgency in including vital information which had not been fully reported since the 1858 excavation. Wilson (1998) stresses that Pengelly's account of the events is honest and accurate and the gratitude and support from Pengelly to Lyell shows he could not have appropriated his work. Further research into correspondence between Pengelly, Prestwich, Falconer and Lyell will reveal his thoughts on the delay of the publication of a Brixham Cave report.

Another case similar to this involved Lyell and John Lubbock. By the time of the publication of *...Antiquity of Man* in 1863, Lubbock was already an expert in prehistory and had numerous papers on this subject published. In March 1865, Lubbock wrote to Lyell sharing that he believed that there were similarities with certain passages in *...Antiquity of Man* and his 1861 papers on Danish shell mounds (Wilson, 2002, 74). Lubbock was worried that it would be him that would be incorrectly viewed as plagiarizing the interpretations from Lyell given his authority and seniority over the young Lubbock. Disturbed by Lubbock's letter, Lyell quickly replied explaining that he had written the early chapters of during the winter of 1860-1861 and was then discombobulated and interrupted from his work by the death of his mother-in-law (Wilson, 2002, 75). Lyell then needed to quickly finish writing the later chapters and to revise the early chapters in the light of literature published since they were written and admitted to hastily using Lubbock's paper to refresh his knowledge (Wilson, 2002, 75). However, Lyell's

response offered no resolution for Lubbock (1865) and in a note at the end of the preface of his *Prehistoric Times* he publicly accused Lyell of plagiarising his work. These claims were supported by Thomas Huxley and Charles Darwin, who wrote of the incident that there was “No doubt Lyell took and forgot whole sentences from Lubbock. It is horrid” (Bynum, 1984, 178). However, since Darwin was Lubbock’s mentor, and given Lubbock’s position in the X-Club with Huxley there may have been some bias in their arguments. It is possible that Bynum used ‘Darwin’ as a figure of authority to bolster his arguments without thinking of the politics involved within Victorian scientists. Furthermore, Bynum’s view was opposed by Wilson (2002, 74) who upon his examination of Bynum’s five chosen passages believed that Lyell’s wording differs from that of Lubbock and was characteristically his own. Wilson states the cause shrinks to two sentences that Lyell had used from Lubbock, but containing information not original to him, this comparison is displayed in Figure 13 below (Wilson, 2002, 75). In Lyell’s reply, he refuted Lubbock’s claim and states that he received most of his information from Adolph von Morlot and suggests Lubbock did also. Lyell clearly did use some of Lubbock’s words, since he admits this to him, however his use was not malicious or plagiaristic in any sense and Lubbock’s attack was likely to suppress an overthought of himself being viewed as an illegitimate younger researcher. Although Wilson used the full correspondence between Lyell and Lubbock effectively, he does not explore Lyell’s correspondence with Morlot as well with his main use being a letter from Morlot in 1865 as an ending note in the conclusion to show that he still supported Lyell after Lubbock’s note in *Prehistoric Times*. The letters between Morlot and Lyell should be explored further to see how reliant Lyell was on Morlot and his views on Lyell’s publication of his work in 1863.

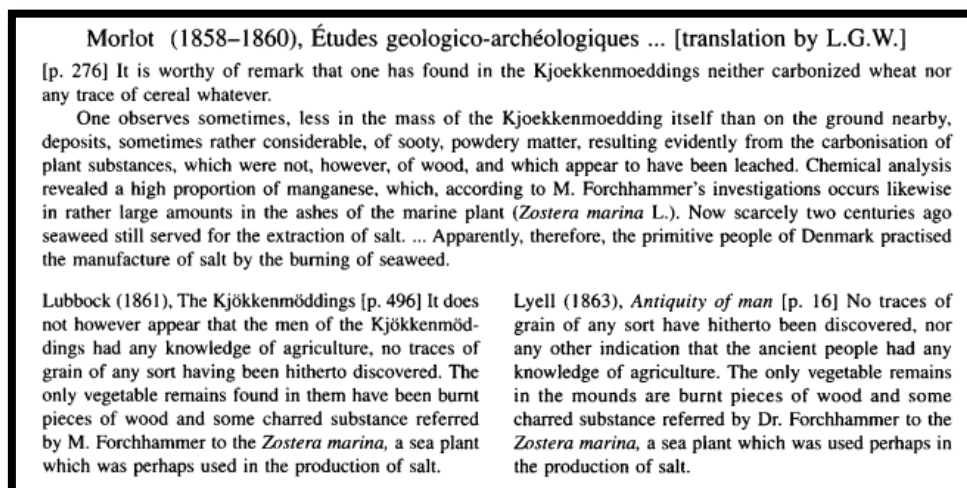


Figure 13. Comparison of the work of Morlot, Lubbock and Lyell on Danish Kitchen-Middens (Wilson, 2002, 75)

Although the choice of Falconer and Lubbock to complain publicly was seen as unacademic by some contemporaries, Lyell's urgent presentation of this 'time shattering' information to the public was not his duty, even if he believed it was. Lyell's way of presenting his fellow researchers work to the wider public made it seem as if he was responsible for it and will tie his name to all the discoveries in the public historical narrative. The consequences of this from a modern view is that Lyell's name is remembered and better associated with pivotal work on the human antiquity debate and developments in prehistoric archaeology, whereas important researchers such as Pengelly and Falconer are not (Pettit & White, 2014, 36; Lyon, 1970, 69). One could therefore argue that it was Lyell's approach that was unacademic. This is however as we have seen not from a lack of proper credit given to these researchers in Lyell's publications. Without Lyell's report on Brixham Cave, Pengelly's contributions may have not been realised at all. From the current literature, the view of Lyell's contribution in the general acceptance of an antiquity after 1859 is authoritative through his influence in the scientific community and respectability in the public eye and there is little evidence showing that he deliberately appropriated others work. However, it cannot be said with certainty until his own scientific notebooks and further correspondence with those he collaborated with in the process of writing ...*Antiquity of Man* is analysed. This will ameliorate knowledge on his exact contributions to the antiquity debate and the development of prehistoric archaeology.

Prophets Without Honour: Early Developments in France

In the late 1820s and early 1830s finds in caves of extinct Mammalia in France helped to prove the contemporaneity of man-made tools and antediluvial animal remains. From 1827-1829, Paul Tournal de Narbonne, with the aid of Marcel de Serres, began a systematic investigation of the small caves found in the mountain of Bize Grotto of the Ariège region (Lyon, 1970, 79). Tournal and de Serres reported a discovery in a cavern in the layer of Jurassic limestone of the fossil bones of extinct Mammalia not then native to the region amongst flint implements and human bone. Tournal understood the important inferences that might be drawn from the science of geology and believed that it would awaken man's pride in showing the antiquity of his race (Lyon, 1970, 82). He described their disappearance as a slow and gradual process and pointed to the simple natural causes, such as the presence of human societies and changes of temperature. This opposed the leading beliefs in geology of catastrophism at the time by Georges Cuvier and demonstrated an important change of thinking contemporary with Lyell on uniformitarianism. Jules De Christol's finds near Montpellier and presentation in 1829

helped support Tournal as it confirmed his opinion that man was a contemporary of extinct and antediluvian species (Lyon, 1970, 83). Jules de Christol asserted that if the word "fossil" could be legitimately applied to the bones of extinct Mammalia found in these caves, then the word was equally applicable to human bones discovered in the same geological circumstances (Lyon, 1970, 83). By the end of 1829 Tournal and Jules de Christol had concluded positively to the existence of human fossil remains and to the contemporaneity of man with extinct and antediluvian species. That Paul Tournal, Marcel de Serres and Jules de Christol are not today credited with the same level of importance as their pioneer work merits is a study in the failure of communication within the scientific community. Lyell (1863) however communicated their research in ...*Antiquity of Man* showing another example where he is anxious to give credit to his fellow researchers in the human antiquity debate. This supports the honesty of Lyell and is further evidence against him appropriating others work.

There was little development until 1837 when Dr Casimir Picard studied stratigraphy of the lower Somme River valley in 1836-37 (Picard, 1836-37). Picard was one of the first prehistorians to propose a typological and technological study of prehistoric tools in cut and polished stone, he stressed the differentiation between chipped hand axes of the Somme valley and that they were not just rough, unfinished tool blanks used to make polished stone tools but represented a different function entirely (Cohen, 1998, 88). He also demonstrated knowledge of lithic technology (Sackett, 2014, 5). It is not clear however, to what extent he came to suspect that the two different traditions are not simply functionally different but are the lithic signatures of two altogether various stages of the prehistoric chronology. However, his adherence to the scientific method, use of stratigraphy, lithic technology and techno-typological analysis made him an important figure in laying the foundations of archaeology as a scientific discipline and in developing the core methodologies used in prehistoric archaeology. Picard died of pneumonia in 1841 at the age of thirty-five. Much like Schmerling, Picard's premature death deprived him of continuing his research and had he been alive through the following decades the early history of prehistoric discovery in the Somme valley would have been far different.

Jaques Boucher de Perthes became familiar with the work of Picard and became obsessed with the gravel pits of the Somme Valley (Sackett, 2014, 5). After succeeding his father as the Director of Customs at Abbeville, Boucher de Perthes started noticing unusual flints in the nearby gravel pits of the workmen and started to develop his theory that these had been shaped by man (Bailey, 1962, 182). From 1842 he began examining the quarries excavated into stream terraces around Abbeville, gradually building up a collection of these flint implements that

supposedly had been recovered from the strata that also produced fossil elephants and rhinoceroses and proposed that because of this the flint implements would have to be as old as the extinct animal remains (Sackett, 2014, 6). Boucher de Perthes trajectory appeared to continue the theoretical work and interpretations of Schmerling, Tournal, De Serres and De Christol's and combined it with the archaeological methodologies of Picard.

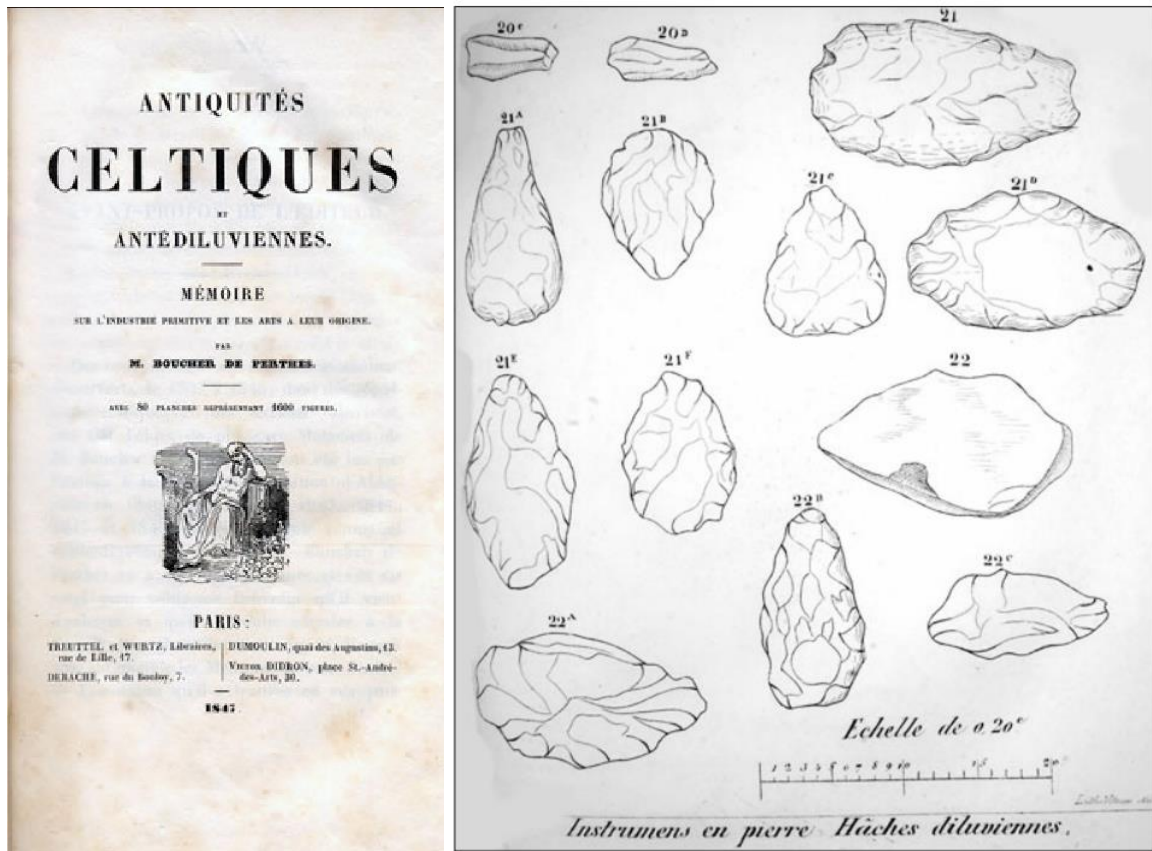


Figure 14. Cover page of *Les Antiquités Celtiques et Antédiluviennes* and some included archaeological illustrations of poor quality (Boucher de Perthes, 1847; Sackett, 2014, 6-7)

By 1847 he had completed the first edition of his *Les Antiquités Celtiques et Antédiluviennes*, shown above in Figure 14 (Boucher de Perthes, 1847; Sackett, 2014, 6-7). However, his presentation of evidence in this publication failed to convert French academic authorities. *Les Antiquités* could have become a turning point in the history of archaeology, but Boucher de Perthes treatment of the subject virtually guaranteed the book would fail to gain a thoughtful hearing. The presentation required clearly documented and well-illustrated discussion of stone tools and strata to be convincing, however he failed to do this. Instead, he lacked familiarity with morphology and lithic technology and was unscientific in his acquisition of evidence, relying on flint implements he bought from the quarry workers whose supply of legitimate specimens was richly supplemented by fraudulent ones they had made themselves (Sackett,

2014, 6). Also in this publication, Boucher de Perthes discussed what he called ‘figured stones’ which interpreted as depictions of animals, human faces and supposedly represented an early stage in the development of language, Figure 15 (Sackett, 2014, 7). However, these were nothing more than naturally shaped rocks and lithic chipping debris that just so happen to resemble figures instead of being deliberately shaped, highlighting his lack of understanding of lithic technologies. Boucher de Perthes’ own poor archaeological illustrations obscured the original information massively (Sackett, 2014, 7). Finally, he proposed the theory that people have a spiritual existence which passes from one geological stage to the next (Sackett, 2014, 7). He was looked upon as an enthusiast or madman for almost a decade by French and British academic authorities and made few converts.

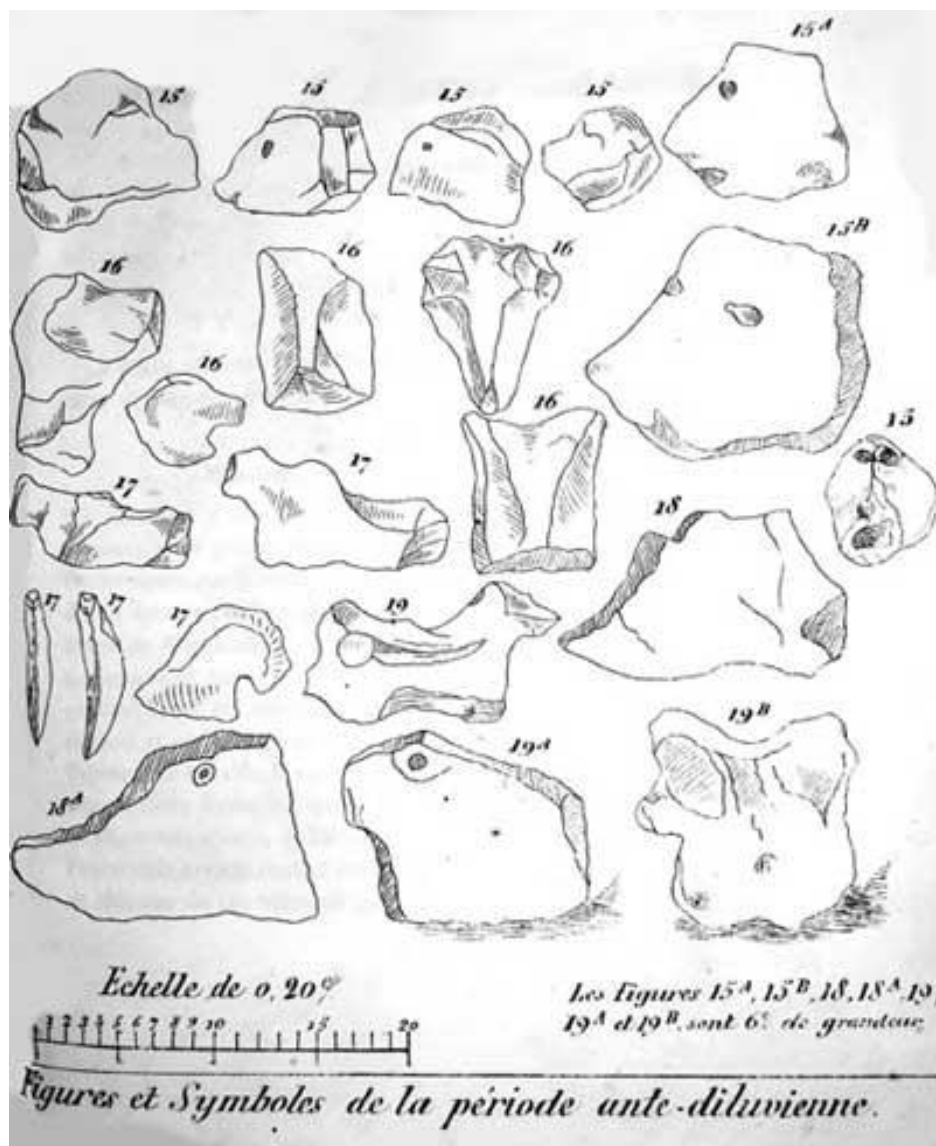


Figure 15. Some figured stones, mostly faces, birds and quadrupeds in Antiques Celtiques et Antediluviennes (Sackett, 2014, 7)

With that being said, his work did stimulate other French archaeologists to make their own forays into the Somme valleys such as Edmond Hebert, Jules Desnoyers and Albert Gaudry (Lyell, 1863, 81). Another was Marcel-Jérôme Rigollot who in 1854 published a straightforward and well-illustrated account of his findings of flint stones bearing definite traces of the hand of man in St Acheul, near Amiens (Sackett, 2014, 8). This was much more convincing to French and British academic authorities. Although still believing in Cuvier's theory of catastrophism, Rigollot's research provided support for Boucher de Perthes. However, instead of seeking further collaboration with Rigollot, Boucher de Perthes became paranoid with the idea that he would not gain the credit in proving human antiquity (Sackett, 2014, 8). The work of Leon Aufrère in 1940 in the archives of Boucher de Perthes shows that instead of re-examining the research questions or implements, he was in the habit of rewriting his own history in terms that progressively lessened the contributions of others while inflating the magnitude and originality of his own achievements (Sackett, 2014, 8). For example, he re-labelled many of the flint tools in his collection to show that he had started his research before Picard's death (Sackett, 2014, 8). In this time, he assumes the role of a prophet who defended the truth against the attacks of misguided critics. John Lubbock says in his *Prehistoric Times* (1865) that "Prophets are proverbially without honour in their own country and Boucher de Perthes is with no exception" (Lubbock, 1865, 269). However, Boucher de Perthes' problem simply boils down to a self-deceptive sense of entitlement, which blinded him to his own errors of interpretative analysis (Sackett, 2014, 8). Despite his determination in the retrieval of flint implements, the contribution of Boucher de Perthes is exaggerated in the history of prehistory, and it was the theories by Tournal and De Christol on human remains and antiquity that were in fact prophetic. Furthermore, it was the work of Picard on developing methods in stratigraphically based science of terrace research and techno-typological analysis that provided the first evidence of an application of scientific method to prehistoric archaeology.

Chronological Developments in Prehistoric Archaeology

Scientists thus far had a non-chronological approach to palaeolithic chronology whereas those of the second half of the nineteenth century tried to impose a chronological order on the Palaeolithic using archaeological evidence. French palaeontologist, Edouard Lartet, was among the pioneers of Paleolithic archaeology and the first to develop a chronological scheme for the Paleolithic, which still holds up today (Chazan, 1995, 458). In 1861 Lartet looked at the fossil bones and portable works of art from a cave site near Aurignac to propose a paleontological

division of the Quaternary into the Cave Bear period, the Elephant and Rhinoceros period, and the Reindeer period (Chazan, 1995, 458). Lyell supported and reported his findings in ...*Antiquity of Man* (Lyell, 1863, 142). Lartet also introduced the study of bone artefacts in addition to flint implements, which represents a novel contribution to the study of prehistoric archaeology. Although Lartet's chronology was only applicable to western-Europe and had no obvious suggestion of evolution it was an important development in setting the pattern for all the chronologies that subsequently followed (Chazan, 1995, 458).

Lubbock's *Prehistoric Times* (1865) contains methodologies which some believe form the basis of prehistoric archaeology (Petit & White, 2014, 37). McNabb (2012, 118) claims it was an ethnographic record which separated Lubbock from other scientists at the time such as Lyell and hence the reason why Lubbock's work was more significant in the development of



prehistoric archaeology. The way Lubbock understood the past was by analogy and that in order to understand the antiquities of Europe we must equally understand those still used by “savage races” in other parts of world (Lubbock, 1865, 336). Lubbock borrowed these methods which were successfully used by geologists who identified extinct European species by looking at existing representatives on other continents (Richard, 2012, 18). The issues around ethnoarchaeological analysis have already been discussed, and apply here (Cameron, 1993, 42). This should therefore not be viewed as a particularly important contribution to prehistoric archaeology, and the popular use of ethnoarchaeology as a result of Lubbock's work has probably been more damaging to the archaeological record than beneficial. Of course, one could say it was Lyell's principle of uniformitarianism that made it possible for Lubbock to invoke a scientific basis for their use of ethnographic analogies to help explain the archaeological record anyway.

Figure 16. Abbbevillian flint tool illustrated in Lubbock's *Prehistoric Times* (1865, 268)

Lubbock also attempts to establish a chronology when he divides prehistory into four periods. Here he coins the term 'Neolithic' as a later stone age period than the Palaeolithic and earlier than the Bronze Age and Iron Age. Pettit and White (2014, 42) claim that this techno-typological comparison and grouping of cultural assemblages is a novel contribution made by Lubbock to prehistoric archaeology. A painted illustration of a flint tool used by Lubbock for analysis can be seen in Figure 16 (Lubbock, 1865, 268). However, these claims are not entirely true since Picard was already using techno-typological analysis to group cultural assemblages back in 1837. Furthermore, although Lubbock defines the Neolithic in terms of industry, he defines the Paleolithic as the period when man was contemporary with now extinct fauna and not through exploring techno-typological differences within this time (Chazan, 1995, 457). It was not until the end of the early 1870's when French archaeologist, Gabrielle de Mortillet was able to define four successive archaeological epochs solely from diagnostic stone tools derived from stratified contexts (Chazan, 1995, 459). Unlike Lubbock, De Mortillet believed that human industrial evolution was a better gauge since it was more abrupt and radical than the evolution of faunas.

Reconstructing the Life of an Object

Objects change through their existence. They accumulate histories, so that the present significance of an object derives from the persons and events to which it is connected (Gosden, 1999, 169). Joy (2009, 540) suggests that since an object can be 'born' and becomes involved in different relationships over its lifetime, it can also 'die' when it is no longer involved in these relationships. This idea of an object biography can create over-anthropomorphisms of inanimate objects which can create issues in discussing its 'life'. Much like living beings, objects are created and brought into being and develop a series of relationships with other things throughout its lifetime, however this is where the analogy ends. Unlike living beings, objects do not expire naturally and, unless destroyed, will exist in one form or another through multiple generations. Throughout its life an object can change purpose depending on the relationships they accumulate and the environment that surrounds it. For example, instead of a palaeolithic flint implement dying when no longer serving a purpose it once had, it continues to exist and carries with it its life history which can then be interpreted when found again by analysing its form. At this moment the object still exists as a flint implement but now also as a historical artefact, which can then change with the relationships it will create through its interactions with researchers, its significance in research and its presence in different collections. It is important

to include the objects' life in different museum collections as well (Friberg & Huvila, 2019, 362). By continuing to study the post-deposition life of the object it also helps to counteract one of the limitations of object biographies which is that it is reliant on the evidence available. Furthermore, having a complete record of the objects' life through its time in collections helps to investigate whether the information has been falsified at any point, as was the case already discussed with some of the Boucher de Perthes examples highlighted by Aufrère. Object biographies allow a close attention to detail which will help to see how Lyell interacted with archaeological objects and the methodologies he used with them to prove human antiquity.

Chapter 3. Methodology and Materials

The approach used to research whether Lyell plagiarized or only had an authoritative role in the human antiquity debate is through the examination of the content of the scientific notebooks and correspondence in the Sir Charles Lyell Collection held within the University of Edinburgh's Heritage Collections. Lyell's scientific notebooks were acquired by the University of Edinburgh's Heritage Collections from Lyell's private collection at Kinnordy House in 2019 under the UK Government's 'Acceptance in Lieu of Inheritance Tax' scheme. In total there are 294 notebooks held in the Sir Charles Lyell Collection ranging from 1825-1874. Twenty of the scientific notebooks were examined from a range of January 1858 (Notebook 231) - August 1865 (Notebook 251) which accounts for Pengelly's developments in Brixham Cave starting in 1858 and a suitable aftermath period of John Lubbock's publication of *Prehistoric Times* (1865).

The correspondence between Lyell and other relevant scientists was acquired by the University of Edinburgh in 1927 when it was donated from Lyell's private collection at Kinnordy House in 1927. Particular attention has been paid to names of researchers mentioned in *...Antiquity of Man* in the selection of correspondence. Letters between Lyell and the following scientists were used:

- Sir John Lubbock
- Jaques Boucher de Perthes
- Edouard Lartet
- Adolph von Morlot
- Gabrielle de Mortillet
- Auguste Aymard
- William Pengelly
- Sir Joseph Prestwich
- Sir John Evans
- Hugh Falconer
- Jean Albert Gaudry
- Robert Alfred Cloyne Godwin-Austen

All available letters from these twelve scientists were examined in their relevance to the publication of *...Antiquity of Man* and the human antiquity debate. By examining Lyell's correspondence with fellow researchers at the time, his research process could be better understood as well as providing insight into how he guided others in helping to answer his questions on human antiquity. It should be noted that in some of the letters written in French, a full translation of the majority was not possible given the timescale of this research. However, the content of the letters of Boucher de Perthes, Aymard, Gaudry and Lartet letters could be

partially understood from a rough translation of French to English and from Lyell's own practice of summarising the content on the envelopes.

A total of six Paleolithic flint tool artefacts from different regions of the Somme Valley in France were chosen for study. As the focus of this research is on Lyell and his contributions, the choice of artefacts was not random and the six were deliberately chosen based on the availability of information which directly connected them to Lyell. This is to ensure that any inferences on Lyell's contributions from these specimens were not speculative and had solid objective evidence which could support his affiliation with them and his interpretations based on them. Of the six specimens two are from Cockburn Geological Museum collection based in the School of Geosciences at the University of Edinburgh. The other four are part of the Vere Gordon Childe Collection in the School of History, Classics and Archaeology at the University of Edinburgh. Although now held in different collections, these six objects, as well as many other specimens from Lyell's private collection, were donated to the University of Edinburgh in 1927 and came directly from Lyell's family home and birthplace of Kinnordy House. Although the collections management and conservation has been inconsistent since then, all six of the objects can be traced back to Lyell through the presence of his name on each of the objects either on the labels or directly written on them. The record of the date from when they were found still survives in its original form on the objects and all six fall within the range of 1859-1861, during the antiquity debate and before ...*Antiquity of Man* was published, thus making them suitable choices for this research.

In order to study Lyell's contribution to the development of prehistoric archaeology and the antiquity debate, object biographies were created for each of the six specimens. As part of this process, their catalogue entries were reviewed to ensure an accurate and up to date record of these objects exists. The process of creating object biographies also allowed for the lives of the individual specimens to be studied in detail and make it possible to examine the relationships it accumulated over its lifetime, including its life in collections. The labels on the objects were also examined and transcribed as part of the object biography through paleographical analysis of the handwriting, this furthered understanding of the relationships of both the objects and Lyell along with different researchers leading up to his publication of ...*Antiquity of Man*.

To support the information in the object biographies of the six specimens, Lyell's correspondence was examined. This involved paleographical analysis of handwriting styles and an examination of the content of letters from Boucher de Perthes and Prestwich to Lyell. The content of the scientific notebooks was also examined with a key focus on the date range of the

objects from April 1859- July 1863 to determine if they could reveal information regarding the life of the chosen objects and their relationship to Lyell or other researchers at the time. Finally, the content of Lyell's *...Antiquity of Man (1863)* was examined in contribution to the object biographies. By cross examination of different sources, the evidence could be corroborated and created a more reliable record.

Chapter 4. Results

Object Biographies

The six objects chosen for this research are displayed in Figure 17. The full biographies of each of these objects are in Appendix A: Object Biographies. Through the method of creating object biographies, all the objects could be directly linked to Lyell and his research into human antiquity. Two of the objects could be identified as the exact ones used in *Antiquity of Man* and therefore directly informed Lyell's interpretations on the antiquity debate. The results from the object biographies also showed evidence of Lyell conducting his own research in different areas of the Somme valley in Abbeville, St Acheul, Menchecourt, St Riquier and Montiers and noting the different traditions used. It also highlights the direct relations with French researchers such as Boucher de Perthes.



Figure 17. The six flint implements chosen for object biographic research, not to scale (Original photographs and processing by Adams, 2023).

Correspondence and Notebooks

Table 1 below shows the results from the analysis of 297 letters between Lyell and twelve fellow researchers who contributed to the content of ...*Antiquity of Man*. Through assessment of these twelve researchers, six of them had letters which proved to be beneficial to the research question. The following paragraphs present the information found in these letters through figures and transcriptions in Appendix B-D. How these contribute to answering the research question will be discussed in Chapter 5.

Evaluation of correspondence between Sir C. Lyell and fellow researchers mentioned in The <i>Geological Evidence of the Antiquity of Man (1863)</i>							
Name	No. of Letters (total)	Date Range	To Lyell	From Lyell	No. of letters concerning...		
					The Publication of <i>Antiquity of Man (1863)</i>	The Content of <i>Antiquity of Man (1863)</i>	Other info on the human antiquity debate
W. Pengelly	74	1860-1873	43	31	15	5	3
J. Evans	35	1862-1872	35	0	2	2	16
R. Godwin-Austin	14	1855-1873	14	0	0	0	0
J. Prestwich	46	1849-1873	45	1	2	9	1
H. Falconer	103	1843-1862	103	0	0	4	9
E. Lartet	14	1853-1872	13	1	-	-	1
J.A. Gaudry	2	1859-1861	2	0	-	-	-
Boucher de Perthes	3	1860	3	0	0	3	0
A. Morlot	21	1859-1865	21	0	2	6	2
J. Lubbock	12	1835-1865	8	3	5	0	0
G. de Mortillet	1	1869	0	1	0	0	0
A. Aymard	1	1859	1	0	-	-	-

Table 1. shows the results from an evaluation of letters between Lyell and fellow researchers that are held in the Sir Charles Lyell Collection (Table created for this paper by Adams, 2023)

o Brixham Cave

The correspondence between Pengelly and Lyell in 1861 included information on how Lyell acquired the details on the Brixham Cave excavations and the politics around the publication of the report. In a letter from Lyell to Pengelly on the 24th November 1861, Lyell sent thirteen queries to Pengelly about Brixham Cave. Twelve of Lyell's queries and Pengelly's response to each of these can be seen in the transcribed letter in Appendix B.

Lyell's letters to Pengelly from the 7th February-20th April 1863, also fully transcribed in Appendix B, reveals Lyell's concerns to Pengelly of being the first to publish results on Brixham Cave and his views on Falconer taking credit in his public response to ...*Antiquity of Man*.

o Danish Kitchen-Middens and Swiss Lake Dwelling

Lyell's reply on the 30th of May 1865 to Lubbock's rebuttal reveals details of Lyell's relationship with Morlot and he gives an account of how he acquired the information from him. Lyell also states that his proof sheets on Danish kitchen-middens and Swiss lake dwellings were first set up for his latest edition of *Elements of Geology* and were instead used in *...Antiquity of Man* before Lyell had received Lubbock's paper. The fully transcribed letter can be seen in Appendix C.

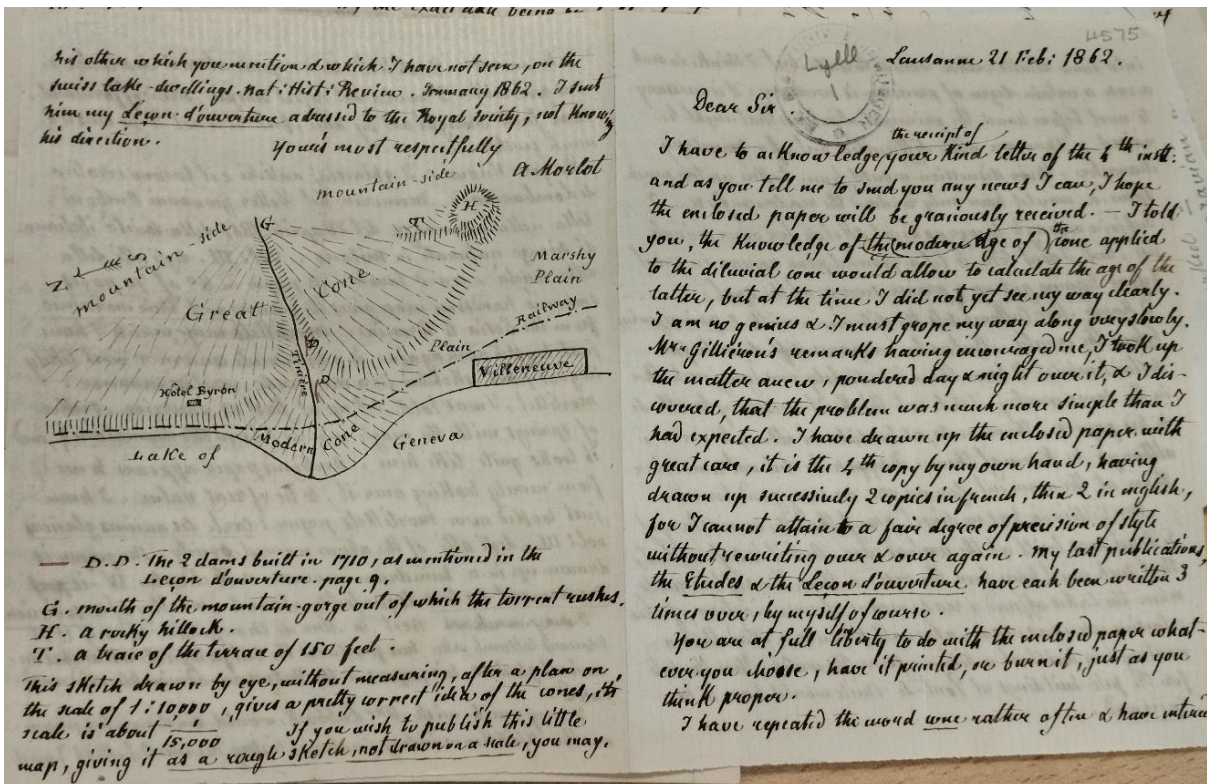


Figure 18. Spread of a letter from Morlot to Lyell showing him sending information on lake dwellings and stating that Lyell can do what he wants with his work (Morlot to Lyell, 21st February 1862)

From 1859 Lyell and Morlot had been communicating on human antiquity in Switzerland and Denmark. From 1861-62 Morlot informs Lyell on the delta of Tinière, a sketch by Morlot of Tinière cone midden can be seen above in a letter from Morlot to Lyell on the 21st February 1862 in Figure 18. In this letter, Morlot states of a paper he enclosed to Lyell that "you [Lyell] are at full liberty to do with the enclosed paper what ever you choose, have it printed, or burn it, just as you think proper". Later, in the same letter, Morlot states an absolute chronological date of the diluvium of the Swiss lake dwellings as 100,000 years old.

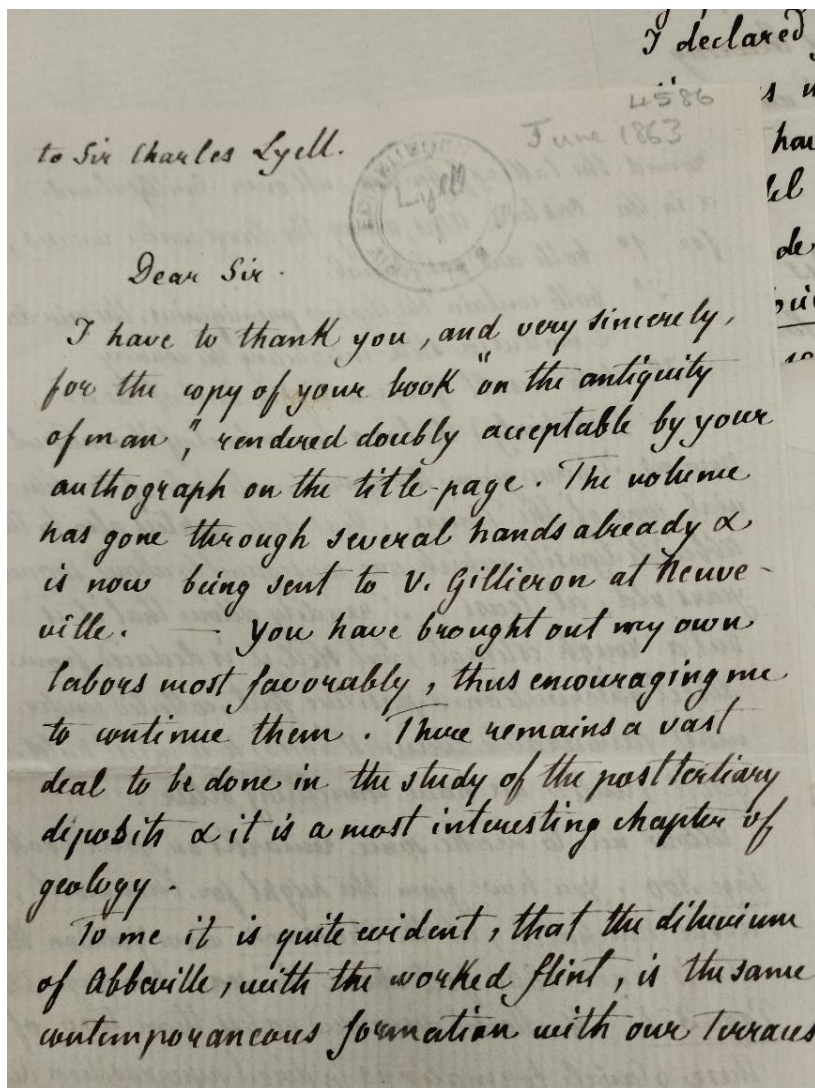


Figure 19. Letter from Morlot to Lyell acknowledging receiving ...*Antiquity of Man* and stating his satisfaction (Morlot to Lyell, 6th June 1863)

After Lyell sent a copy of ...*Antiquity of Man* to Morlot, he responded to Lyell in a letter on the 6th June 1863. The first page of the letter is displayed in Figure 19 and highlights Morlot's gratitude for receiving a copy, he goes on to say that "you have brought out my own labors most favorably, thus encouraging me to continue them" and he offers his opinion on the age of the Abbeville deposits with worked flint as being the same as the approximate date of the Tinière diluvium of at least 100,000 years old.

○ Hoxne, Bedford and Icklingham

Lyell's research in the south of England is recorded in his notebooks from the 11th May 1861 after his third visit to the Somme valley. He records going to Icklingham, Hoxne and Bedford with Prestwich and finding flints (Notebook 246, 69). Evan's letters to Lyell from 27th September 1862 to 18th February 1863 report multiple excavations and research by him in Northampton, Reculver, Bedford and Icklingham. In Evans' letter to Lyell on 10th March 1863, he includes archaeological illustrations of some of his finds, Figure 20, and notes the presence of *Elephas primigenius* and *Bos antiquus*. Evans also assesses the relation and similarity of these finds in south England with those of the Somme valley.

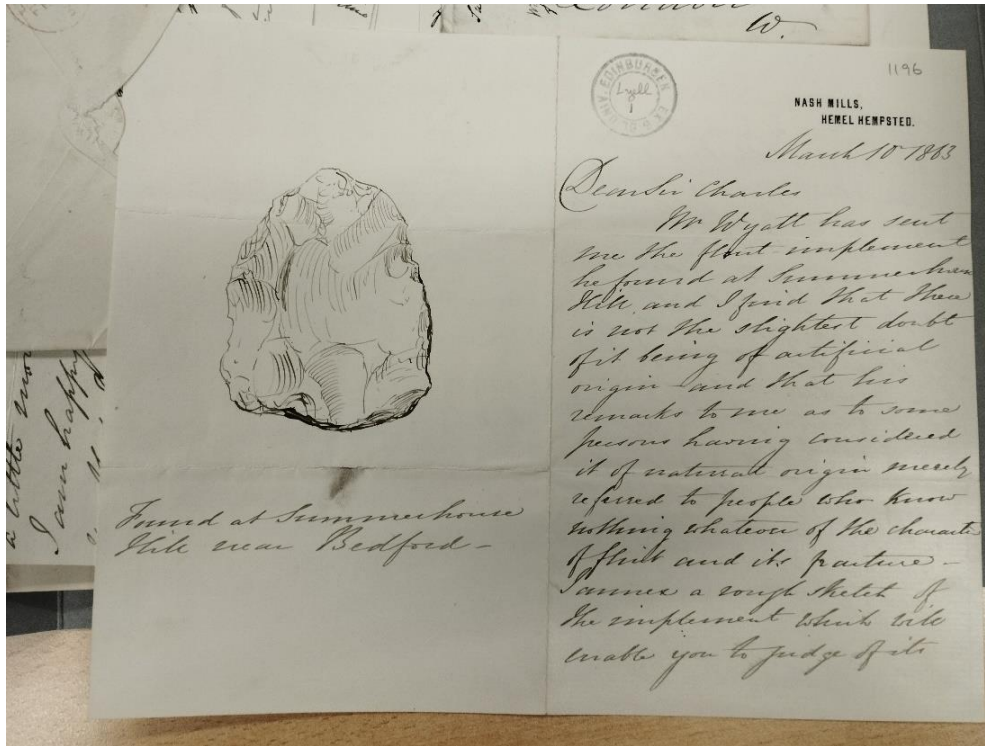


Figure 20. Spread of a letter from Evans to Lyell showing an archaeological illustration of a flint implement from Summerhouse Hill, near Bedford (Evans to Lyell, 10th March 1863)

o The Valley of the Somme and the Moulin Quignon Jaw

Lyell's notebooks reveal details about Lyell's research in the Somme valley. After Prestwich and Evans find in St Acheul in April 1859, Lyell visited in the July of that year with Boucher de Perthes the localities of Abbeville which he lists as Menchecourt, Moulin Quignon and St Gilles and with Prestwich the localities of Amiens which he lists as St Acheul, St Roch and Boves. In the index of notebook 238, Lyell notes that 400 hatchets have been found at Abbeville and mentions buying sixty hatchets in Amiens (Notebook 238, pg 1). Lyell also notes finds before 1859 with a statement from Rigollet that "in the year 1836 at least 200 hatchets in a heap-a knife - many then at St Acheul all at 14 or 15 ft from the surface" and notes that in Boves a workman found a flint hatchet ten years ago (Notebook 239, pg 14 & 26). Lyell also notes finding marine univalves and *Cyrena* with flints at Menchecourt and the same situation with the hippopotamus of St Roch (Notebook 239, pg 26-30). Lyell sketches an *Elephas antiquus* molar in M. Garnier's collection noting its presence with flints, see Figure 21 (Notebook 238, pg 137). Lyell's knowledge of *Cyrena* and *Elephas antiquus* and *primigenius* in relation to the position of flint implements can be traced back to a letter by Prestwich on 28th May 1859 before his first visit where Prestwich suggests that *Cyrena* lived with the mammals.

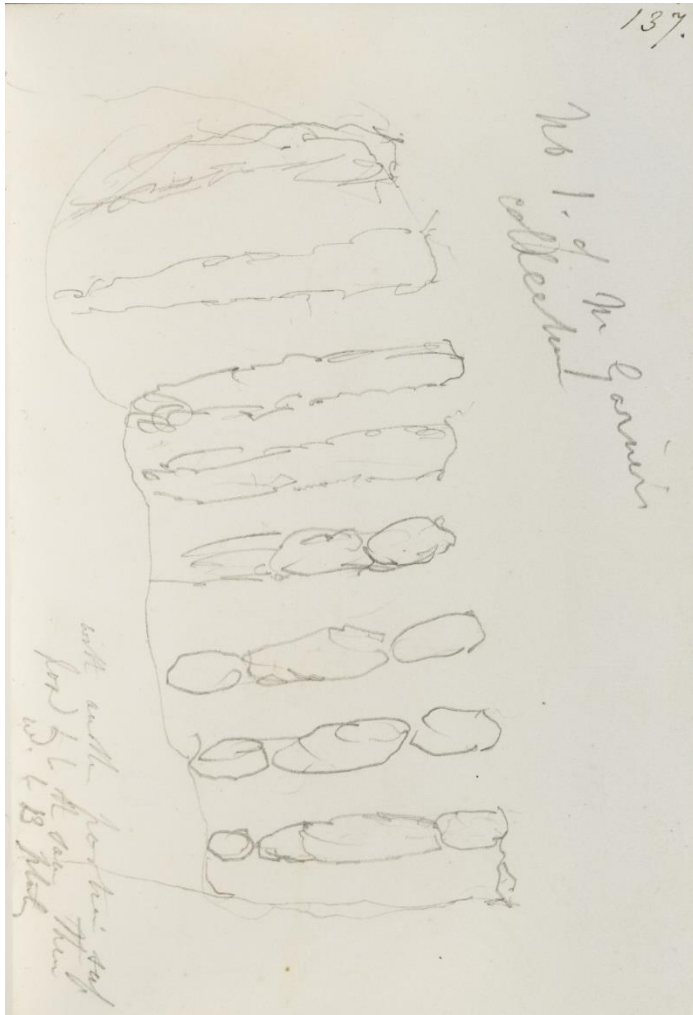


Figure 21. Garnier's elephant molar, sketched by Lyell (Notebook 238, pg 137)

Before Lyell's second visit to the Valley of the Somme in July 1860 he receives multiple letters from Prestwich on *Cyrena fluminallis* at Mencheourt, St Roch and *Cyclas* at Abbeville. In a letter to Lyell on 22nd May 1860⁵ Prestwich includes an eyewitness account of Woodward of finds of *Cyrena fluminallis* at Menchecourt.

Lyell's second visit to these sites is recorded in Notebook 243 with visits to Mautort, St Riquier and Amiens (Notebook 243). Lyell then visits Belgium to examine finds of flint implements of the St Acheul type reported by M. Toilleng of Spiennes. Lyell's third visit in March-May 1861 is recorded in Notebook 245 & 246.

This involves Lyell mainly visiting Amiens, Menchecourt, Mautort,

Montiers and St Riquier with Boucher de Perthes, Lartet, Evans and Prestwich. Lyell conducted excavations in these localities paying particular attention to stratigraphy and the relation of flint implements to extinct mammals and marine bivalves (Notebook 245, pg 138).

Lyell's correspondence with Evans on 17th May 1862 shows that Lyell received information on the difference between St Acheul and Abbeville implments. Evans shows examples from his own archaeological illustrations which he enclosed in the letter to Lyell, seen in Figure 22. Evans describes the Abbevillian flints as broad and skillfully made and states that a larger number of flakes formed by percussion were discovered at Abbeville and not any from St Acheul. Evans describes the St Acheul types as spear-heads and states they would have been chipped along a thin edge.

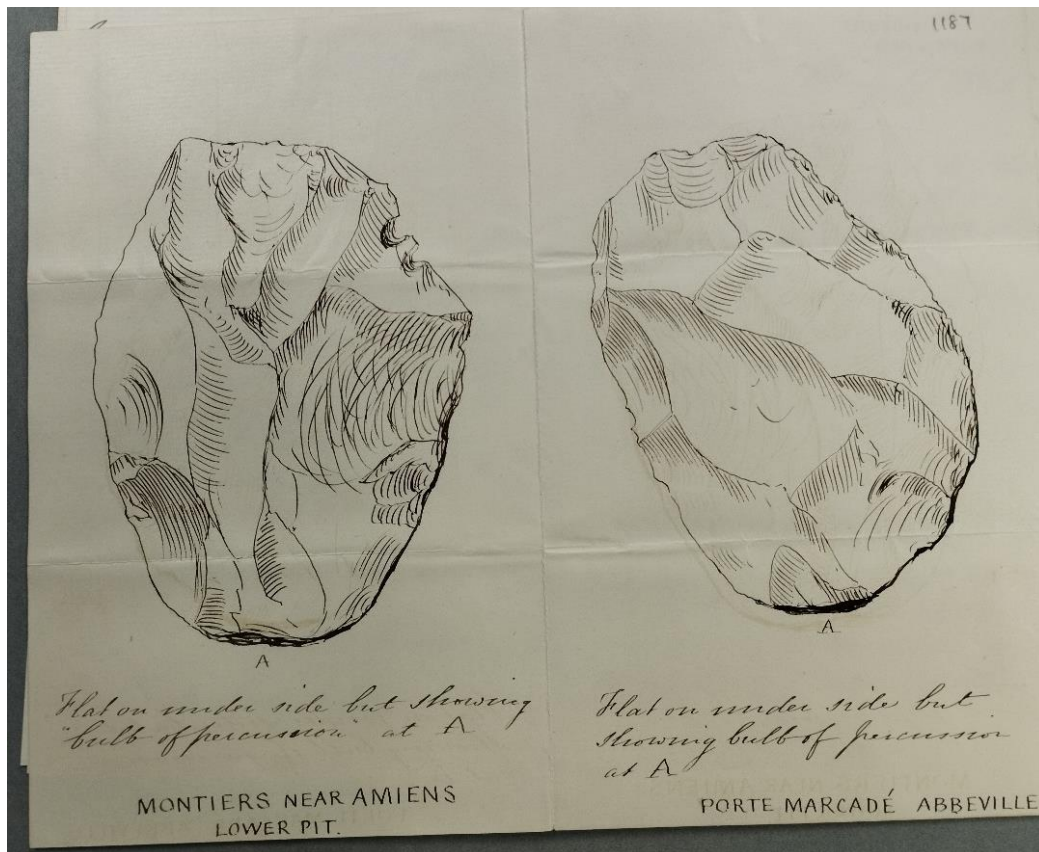


Figure 22. Enclosed illustrations of Abbeville and Amiens hatchets (Evans to Lyell, 17th May 1862)

After receiving a copy of the first edition of *...Antiquity of Man*, Prestwich seems dissatisfied with Lyell's mention of his work. In a letter from Lyell to Prestwich on 17th March 1863, Lyell replies to Prestwich's grievances and appears apologetic and unsure of why Prestwich would feel this way. The full letter has been transcribed and is visible in Appendix D.

A series of letters from Evans to Lyell from 15th April 1863 to 26th July 1864 discuss Boucher de Perthes and a new find of a human jaw at Moulin Quignon, Abbeville with multiple flint implements. Evans and Prestwich, who were in Paris at the time of discovery visited Boucher de Perthes and evaluated the new finds. Evans claims that these were modern fabrications and showed evidence of being made by the same hand and coated with clay that "when washed their recent origin becomes apparent". Evans condemns the finds and the jaw. In a letter to Lyell on 18th June 1863, Evans speculates that the source of the forged flints were the Abbeville workmen who would have made them with a chisel or hammer. He states that "90% of the flint implements found in the peat are modern forgeries many of them apparently by the same hand". Evans also encloses an eyewitness account for Lyell and states that he plans to, with Prestwich, write *Athenaeum* letters about the fraud of evidence of high scientific importance. The notebooks record Lyell visiting France again in March-July 1863 with Desnoyers, Falconer

and Armand de Quatrefages and going to St Prest and Moulin Quignon to assess this new evidence for himself (Notebook 248, pg 78-108). Lyell notes that after the letters from Evans and what he saw in his visit to Moulin Quignon he would have to make corrections for the third addition of ...*Antiquity of Man*.

Chapter 5. Discussion

- Did Lyell appropriate the research of fellow labourers?

A close examination of Lyell's correspondence has produced a series of results which can assist in understanding whether he authenticated or appropriated others research for example the Brixham Cave controversy involving Lyell and Pengelly against Prestwich and Falconer. In examining the queries sent by Lyell to Pengelly and the answers in the reply visible in Appendix B, it is clear that Lyell got his information legitimately from Pengelly and one can see the similarities between what is published in ...*Antiquity of Man* and Pengelly's information. In particular Lyell's wording of the colour of the bone-earth as "ochreous red", the account of the find of remains of *Ursus spelaeus*, and information on the flint knives, Pengelly's influence is obvious (Lyell, 1863, 77-80). Although Pengelly supplied the information, Lyell's questioning helped to direct the important facts about Brixham Cave which helped to prove human antiquity.

In a series of copy letters from Lyell to Pengelly from 1863, displayed in Appendix B, Lyell discusses the publication of the Brixham Cave results. Upon the release of ...*Antiquity of Man* Lyell questions on behalf of the Brixham Cave Committee why Pengelly, Falconer and Prestwich had not published yet as it is "*discouraging*" for the Royal Society to not see how their funds were used. He also anticipates Falconer's anger and warns Pengelly not to "do anything that can offend Dr Falconer, who will be reasonable in the long run". Lyell is also concerned that he has become the first to publish on Brixham Cave and appears apologetic because of its success so far, he asks Pengelly for any corrections for the next edition. In the next letter, Lyell is impressed with Pengelly's corrections and notes of the obstacles put in the way of the publication of Pengelly's account that "*if I were not afraid of doing mischief, I should take it more vehemently, but I shall forget it*" showing that Lyell is trying to diffuse the situation in the best interest of Pengelly and others. The next letter reveals that Lyell's diffusion of the situation is an attempt to secure Pengelly's election as a Fellow of the Royal Society (F.R.S), showing that Lyell believes that Pengelly should be credited for his work in Torquay and his intentions were to ensure that Falconer and Prestwich did not leave him behind. It also shows in the same letter that Lyell has Evans support in this matter. After Falconer's "*explosion*" in the Athenaeum as Lyell calls it, he notes that Falconer is appealing from unpublished material and asks Pengelly for his history of the excavation. Lyell follows this up with his statement claiming Falconer's response to be "*unhandsome*" and confirms in writing

that Pengelly was the source of the information on Brixham Cave published in ...*Antiquity of Man*. On Lyell's response to Falconer he reveals that Pengelly and Darwin fully support his actions and were against Falconer in this case and reiterates his desire for Pengelly to become a F.R.S. Overall these letters between Lyell and Pengelly prove that Lyell had an authoritative role, and did not appropriate the research of Falconer, Prestwich or Pengelly. After waiting four years for Falconer and Prestwich to publish their memoirs, Lyell believed it was necessary to include Pengelly's account of the Brixham Cave excavations, not only to aid in the antiquity debate but to avoid poor relations with the Royal Society who funded the research. On a political level within the British scientific community already discussed by Wilson (1998), Lyell wanted to ensure that Pengelly received the credit that Falconer and Prestwich were denying him and was determined for Pengelly to receive F.R.S. for his work on Brixham Cave.

Whether Lyell plagiarized the work of Lubbock has been touched on by Wilson (2002) however this research confirms Lyell's intentions and innocence. In Lyell's final reply to Lubbock, Appendix C, he states that his proof sheets on Danish kitchen-middens and Swiss lake dwellings were first set up for his latest edition of *Elements of Geology* before Lubbock had visited Denmark. Lyell continues to admit that he re-worded several of Lubbock's passages to make quick amendments to his pre-written sheets based on Morlot's papers before the publication of ...*Antiquity of Man*. Lyell conveys his disapproval of the way which Lubbock worded the note in his book and suggests a more academic approach which should have suggested by his friends. This led Lyell to believe that Lubbock did not show them their chain of correspondence on the matter. Lyell concludes by claiming that Lubbock had petty reasons for doing what he did and his anxiousness in appearing illegitimate was the cause for Lubbock's unfriendly actions. Lyell's support from Morlot seen in Figures 17 & 18 shows that Lyell did not plagiarize the work of Morlot and had permission to do "*whatever you (Lyell) choose*" with his work. Although Lyell reworded Lubbock's words on Danish Kitchen Middens and Swiss Lake Dwellings he did not maliciously steal from him in the way that Lubbock makes it out to be. He never denies the use of Lubbock's work, however Lyell may have needed to explain it better to avoid this confusion. A large part of this confrontation stems from Lubbock's fragile ego and whatever politics are involved within their mutual "*friends*". This highlights a topic which would benefit from further research into the correspondence of Lubbock with Darwin, Hooker, Huxley and Busk from 1863-1865.

Prestwich also took issue with the way in which Lyell published his research, especially in the Somme valley. Appendix D shows a transcribed letter of Lyell's response which highlights that

he is unsure how Prestwich could have felt unsatisfied, given the strong praise he gave to his authority in ...*Antiquity of Man* and invites him to make amendments to the proof sheets. Lyell also supports himself with a mention of the “*warm letter*” which Boucher de Perthes sent to him about the book. Lyell concludes by stating that Prestwich should trust that Lyell wants to make sure credit is given to his fellow labourers and ends saying “*I am always anxious to do justice*”. Lyell’s good nature when it comes to credit is supported by his efforts to include the contributions of Pengelly, Morlot, Schmerling, Tournal and De Christol, in the human antiquity debate when little attention had been paid to them by others.

- Assessment of Lyell’s contributions to the human antiquity debate

Now that the accusations of appropriation can be dismissed, one can effectively discuss Lyell’s contributions to the antiquity debate and the development of prehistoric archaeology. The results show that Lyell conducted no original research in his first visit to the Somme valley in 1859, this trip appears to be more of a journey of personal acceptance for Lyell for the possibility of human antiquity and to assess the recently found evidence for himself. In this visit he is shown around various pre-excavated sites by Prestwich and Evans in Amiens and with Boucher de Perthes in Abbeville. Lyell shows particular focus at this time to the stratigraphic relationships between the fossilised elephant molars and flint implements, though this is mainly through being informed by researchers such as Garnier and Falconer who had already interpreted the importance of the contemporaneous finds. Lyell is convinced of the idea of human antiquity through this contemporaneity of flint tools with fossil bones first at Brixham Cave and then at the Somme valley which leads to his important address to the British Association for the Advancement of Science later that year in Aberdeen. Analysis of his notebooks and correspondence offer no new insights at this time from Lyell and his role is largely authoritative based. Before his second visit in July 1860, Lyell’s concentration was fixed on researching the relationship that the extinct shell species of *Cyrena fluminallis* and *Cyclas* had with the fossilized mammal remains and the flint implements of the Somme valley. The biography of the object VGC1368 in Appendix A shows that Boucher de Perthes was informing Lyell of his new developments and sent him flint implements found with shells in Abbeville. Furthermore, Lyell’s knowledge of *Cyrena fluminallis* in relation to the position of flint implements can be traced back to Prestwich in 1859. From then Prestwich and Lyell had multiple interactions involving *Cyrena fluminallis* from Prestwich’s own excavations in Abbeville probably with Boucher de Perthes. This shows that Lyell’s second visit in 1860 was similar to his first in assessing the new evidence found by Prestwich and Boucher de Perthes

and his intent on visiting is not to conduct any new research but to authenticate for himself the finds of others. This theme of Lyell assessing other's work can be seen in Lyell's research in the south of England. He records going to sites already excavated by Evans and Prestwich in Icklingham, Hoxne and Bedford after they already assessed the relation and similarity of finds in south England with those of the Somme valley. In Lyell's third visit in March-September 1861, he conducts his own excavations as seen through the object biographies of the remaining five implements, Appendix A, which came into Lyell's possession in his travels around the Somme valley. Lyell appears to be assessing the different type of flint tools by region and their relation to *Cyrena fluminallis* levels. Lyell pays particular attention to Menchecourt and the flint knives found there as well as the unifaces of St Roch and Montiers which he notes being of different form to the Abbevillian and Acheulean examples. However, Evans (1860) had already noted the three kinds of implements found at the Somme valley, including the flint knives, in his report. Lyell (1863, 92) references Evans' classification in ...*Antiquity of Man*. Furthermore, the St Riquier example in Appendix A represents a far more interesting object demonstrating a regional variation in the type of flint used and unique traditions which appear to be an intermediate step from the earlier Abbevillian types to the later Acheulean spear-heads. Although present in Lyell's collection, he lacks the archaeological knowledge to add anything to the debate and instead chooses to reiterate Evans' classification from three years prior to ...*Antiquity of Man*. Lyell was very much involved in the research around the antiquity debate, especially in research conducted with Prestwich and Boucher de Perthes on *Cyrena fluminallis* however after examination of his notebooks and correspondence his main role is that of an authority figure whose renown and status in the scientific community helped in the general acceptance of prehistory.

- To what extent did Lyell aid in the development of prehistoric archaeology?

"It would be a great mistake to imagine that an antiquary or geologist, who should devote a few weeks to the exploration of such a valley as that of the Somme, would himself be able to detect a single specimen" - (Lyell, 1863, 93).

In Lyell's admission here he conclusively denies any expertise in prehistoric archaeology and a lack of knowledge of lithic technology and typo-technological classifications. His notebooks show no new interpretations on the form of the French and English flints and he relied heavily on the pioneering techniques of Evans. It was also Evans who used his own knowledge on lithic technology to re-create flints through observed knapping techniques (Lyell, 1863, 93). Evans used these techniques to prove that the Moulin Quignon flints found in 1863 were forged

implements and in the process developed the discipline using experimental archaeology (Lamdin-Whymark, 2009). Anything learned archaeologically from Lyell's objects in Appendix I can therefore be attributed to the knowledge of Evans, especially the two figured specimens in ...*Antiquity of Man*. Lyell therefore aided in the development of prehistoric archaeology from little to no extent. Other than finding specimens and authentication, Lyell's contribution was mainly geological through stratigraphic analysis of the relation of flints to extinct shells and fossils. It was instead the work of Evans who focused on information available from the flint implements which furthered the early archaeological developments by Picard in 1837 and aided in establishing the classifications of flint implements by region through techno-typological analysis. This laid down the framework for Lartet and De Mortillet to develop prehistoric chronology further.

- The benefit of creating object biographies for the longevity of collections

By creating object biographies, Appendix A, three of the chosen objects currently located in a draw labelled '...Misc. French Flints' have now (2023) been properly catalogued and can conclusively be recognized as objects that were excavated, handled, and researched by Sir Charles Lyell thus restoring their historical and scientific significance. Particularly with VGC1363 which matches the figured illustration in Lyell's ...*Antiquity of Man*. The work conducted here will hopefully change the purpose of these object from teaching collection items to a research collection item with the opportunity to utilize the paper archive and digital images, as well as the conservation department, held within the University of Edinburgh's Heritage Collections or as part of an independent Sir Charles Lyell Archaeological Collection held within the School of History Classics and Archaeology. Objects such as VGC1368, which have important fragile labels, and have noticeable damage since it was last catalogued, should not be held in teaching collections and are at risk of further damage through untrained object handling skills.

Chapter 6. Conclusion

Through an analysis of Lyell's correspondence and notebooks, it can be stated that Lyell did not appropriate the work of his fellow researchers such as Falconer, Prestwich and Lubbock. After waiting four years for Falconer and Prestwich to publish their memoirs, Lyell believed it was necessary to include Pengelly's account of the Brixham Cave excavations, not only to aid in the antiquity debate but to avoid poor relations with the Royal Society who funded the research. Lyell also wanted to ensure that Pengelly received the credit that Falconer and Prestwich were denying him and was determined for Pengelly to receive F.R.S. for his work on Brixham Cave. Lyell's use of some of Lubbock's work has a believable explanation by Lyell and a large part of this confrontation stems from Lubbock's fragile ego and whatever politics are involved within their mutual "friends". This represents an area which would benefit from further research to understand why there was so much tension amongst Victorian British scientists with the fear of losing respectability and the importance of authority in research. The monetary wealth gained from publications and publicity may also be crucial to this discussion. Prestwich was unsatisfied with the way in which Lyell presented the work of others as a form of compilation and believed that it was not Lyell's to present. As an authority figure himself, Prestwich may not have liked to admit how necessary Lyell's authentication of this evidence was to the acceptance of human antiquity. From the finds of human remains at Engis and Feldhofer, the Brixham Cave explorations, to the Somme valley, Lyell's primary contribution was the authentication of others research. He conducted no new research, but was very much involved in each step of the human antiquity debate through his own on site excavations and critical thinking. Lyell's most authoritative contributions can be seen through his address to the British Association for the Advancement of Science at Aberdeen which helped to champion the recent finds in Brixham and Abbeville, and through his publication of *...Antiquity of Man* which was a convincing compilation of evidence and thought in support of human antiquity. These examples demonstrate his power as a scientific communicator and his ability to attract viewers and therefore sales. An area for future research would be an investigation into Lyell's reasons for writing *...Antiquity of Man* and why he took responsibility for the publication of others research. An examination of the John Murray Archive held at the National Library of Scotland may be an adequate place to start.

Although Lyell revolutionised the tone of thinking about deep time with his theory of uniformitarianism, much of what he learned archaeologically through his flint implements to support human antiquity was through the previous work of Evans. The method of using object

biographies which were supplemented by comparison with publications, notebooks and correspondence proved essential in showing Lyell's connection to the objects and how he used and interpreted each of them. Lyell mainly thought of the flint implements from the view of a geologist and tried to establish the relationships between them and the extinct shells and Mammalia through stratigraphic analysis instead of examining what can be learned archaeologically from the flint tools. Lyell therefore did little to help in the development of prehistoric archaeology, compared to those such as Picard, Evans, Lartet and Mortillet. Lyell's correspondence with Lartet as well as other non-English speaking scholars is voluminous and needs further research to improve understanding of his contributions to the antiquity debate and prehistoric archaeology.

Finally, six historically/scientifically significant and valuable objects have now (2023) been identified in two teaching collections held at the University of Edinburgh through this research. This highlights a need to update existing catalogues with object biographies and to reevaluate the preventative conservation measures currently used in these collections. To ensure the longevity of these objects a separate Sir Charles Lyell Archaeological Collection should be developed within the School of History Classics and Archaeology, this will ensure the objects are not used for teaching. Alternatively, it may be necessary for these objects to enter the University of Edinburgh's Heritage Collections, which will allow for proper collection care protocols to be implemented.

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○ Notebooks

Notebook 238 17 April 1859-28 July 1859

Notebook 239 29 July 1859-11 August 1859

Notebook 243 6 July 1860-23 July 1860

Notebook 245 6 November 1860-March 1861

Notebook 246 April 1861-September 1861

Notebook 248 30 March 1863-29 July 1863

Appendix A: Object Biographies



Accession Number: EUCM.0001.2022

Locality: Mautort, France

Name: Flint Tool - Figured Specimen

Material: Flint

Ownership: The University of Edinburgh

Location in Museum: Sir Charles Lyell Collection, Box 10

Weight: 338g

Dimensions: 13cm x 9.5cm x 4cm

Biography:

The specimen is an oval shaped flint tool. It is white and light grey/dark blue in colour. The specimen is typical of Abbevillian traditions used in hand-axe creation with conchoidal fractures on both faces creating a sharp cutting edge around the circumference. This specimen can therefore be classified as a bifacial hand-axe. Abbevillian is generally regarded as an early sub-phase of the Acheulean tradition. The similarity of the simple structure of the cores of Abbevillian flint tools with the Oldowan tradition of Tanzania makes it possible as the next step

in the evolution of tool making and would have developed after the African exodus into Eurasia. Therefore, flints such as this one contain important information about how hominid habitation and behaviour first evolved in prehistoric Europe. Electron Spin Resonance (ESR), magnetostratigraphic and Uranium- series dating methods have provided an absolute date of the lower Abbevillian levels to being 600 KA ± 90 BP (Bahain et al, 2007, 360). This would be around the time when *Homo heidelbergensis* would be inhabiting the forested landscape (Antione et al, 2019, 1). *H. heidelbergensis* would have deliberately manufactured hand axes such as this one to serve multiple functions and could serve as a multi-tool to tackle the tasks of specialist implements such as scrapers, cutters, cleavers. This tool would have been manufactured by hand through the process of flintknapping by one hand to strike a core and create a sharply flaked biface. This can be seen through the asymmetry of the creation of the edges and a non-central median ridge. The tool would have been abandoned by its original creator either through intentional or unintentional deposition.

The object was then found in 1861 by Sir Charles Lyell during his excavations from March 1861-September 1861 in Mautort, Abbeville (Lyell, Notebook 245, 148). This is indicated by the words 'Sir C. Lyell, Mautort Abbeville 1861' which are written directly on the surface of the object. After Prestwich and Evans' 1859 discovery of ancient flint implements in St Acheul and the following two-year antiquity debate, Lyell visited the Somme valley sites three times (Lyell, 1863, 88). Lyell was investigating the presence of flint implements in the same stratigraphic layers as extinct animal remains. He was also studying whether hand axes such as these were made by humans and set out to gain evidence on the subject (Lyell, 1863, 88). During his trip to Abbeville in 1861, Lyell was accompanied by Boucher de Perthes. Lyell published his interpretation of the evidence in *...Antiquity of Man* (1863). On detailed analysis of this object, it matches with one of the specimens which was an illustrated figure in *...Antiquity of Man* (Lyell, 1863, 90). The comparison below shows how the specimen correctly matches to "Fig 9." in Lyell's book through correspondence points of an image of the object and the illustrated specimen both scaled to the same size (Adams, 2023). The match is also backed up by Lyell's description of the specimen as being an "Oval-shaped flint hatchet from Mautort, near Abbeville" which matches with the label description and his scientific notebooks which place Lyell in Mautort in 1861. Lyell also states the flint as being "5 ½ inches long" (13.0-14.0cm) which is consistent with the current measurement as being 13.9cm long.

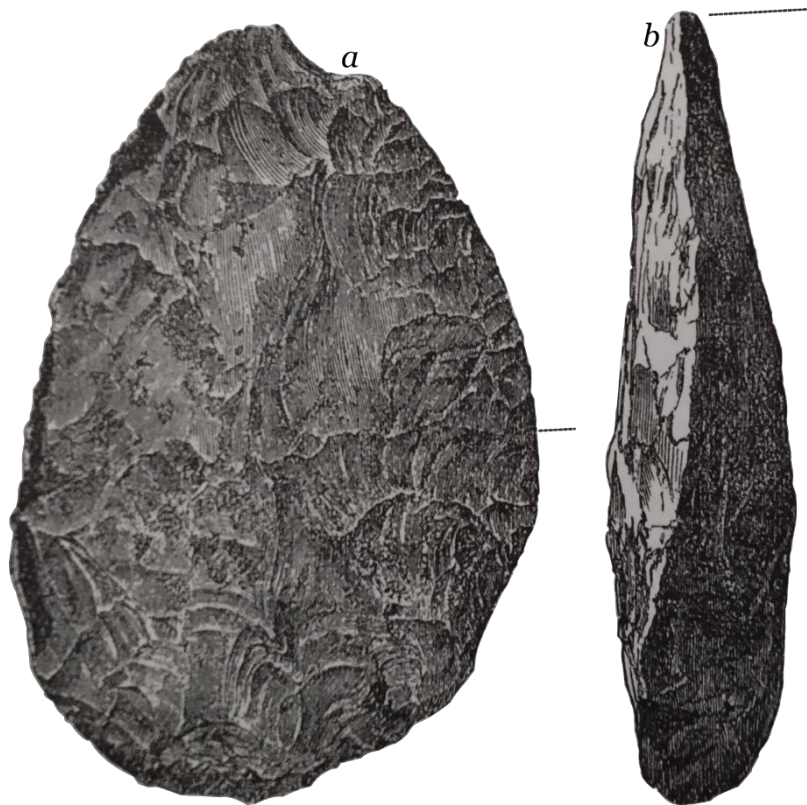


Illustration showing similarities between photographs of EUCM.0001.2022 taken by Adams (2023) and the specimen illustration of Fig.9 adapted from Lyell's ...*Antiquity of Man* (1863)

Furthermore, Lyell in his description offers some more information of the life of this object in discussing how the fracture, indicated in Figure 1, happened recently and was not present at the time of deposition. Lyell uses taphonomic analysis of the fracture to determine this by noticing how the white outer coating was not visible in the fractured section of the flint and suggests that the entire surface of the flint tool would have been black when first shaped. He suggests the bleaching of the surface may have either been through exposure to the sun and air before it was embedded or through deposition in the soil. Lyell also states that oval-shaped flints such this one are more common in Abbeville and in the lower gravels of the Somme valley. Lyell also gives the exact context in which this object was found as being from “a bed of gravel underlying the fluvio-marine stratum” (Lyell, 1863, 90). When excavated in 1861 the object changed its function from a prehistoric hand-axe to a scientific artefact used by Lyell as an important piece of evidence in proving human antiquity. After 1863 the scientific artefact function remained, however with its presence in Lyell’s ...*Antiquity of Man* it entered equal importance as a historical artefact in the history of Sir Charles Lyell and the antiquity debate in the mid-19th century.

The life of the object is uncertain from 1863. It was likely held in Lyell’s own private collection at his family home in Kinnordy Estate, Scotland. In 1927, some of the Lyell collection was donated to the University of Edinburgh from Lyell’s descendants at Kinnordy Estate. Separated and distanced from the archival records, the objects provenance and significance was disassociated for almost a century and served a purpose as part of the School of Geosciences general teaching collection. In 2022, Dr Gillian McKay, Curator of the Cockburn Museum, catalogued this specimen and noted the historical and scientific importance through its label. Through correspondence with archivists at the University of Edinburgh’s Heritage Collections the object was moved to the Centre for Research Collections and recognized and included as part of the project to catalogue and make accessible the newly acquired tranches of records forming the Sir Charles Lyell Collection. Through the research conducted in this paper (2023), the object can conclusively be recognized as an object that was excavated, handled and researched by Sir Charles Lyell thus restoring its historical and scientific significance and changing its purpose to a research collection item.



Accession Number: VGC1363

Locality: Menchecourt, France

Name: Flint Scraper

Material: Flint

Ownership: The University of Edinburgh

Location in Museum: Vere Gordon Childe Collection, C11.1 (More Misc. French Flints)

Weight: 35g

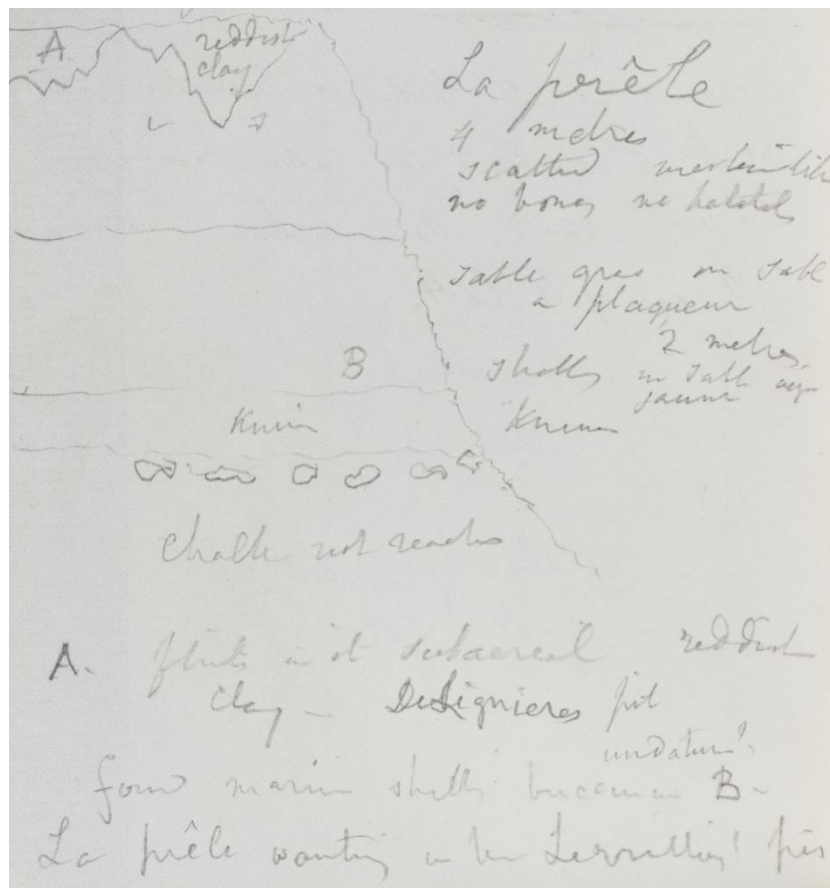
Dimensions: 8cm x 3.8cm x 1.2cm

Biography:

The object is a light-grey/blue flint knife. It appears to be a uniface flake which has been artificially manufactured on one face after being fractured from a larger core. The object has a sharp cutting edge and would probably be used as a scraper tool or knife for light butchery or hide preparation. The creator of this object would have used hand flint-knapping techniques on the outer face to create this edge, leaving the freshly fractured surface unaltered. The object appears to have been fractured into multiple pieces since there is a visible transverse section. Although not a biface, the tool appears to use Abbevillian traditions in its manufacture.

Electron Spin Resonance (ESR), magnetostratigraphic and Uranium-series dating methods have provided an absolute date of the lower Abbevillian levels to being 600 KA ± 90 BP, which would place the manufacture of this object around the time of *Homo heidelbergensis* (Antione et al, 2019, 1). The tool would have been abandoned by its original creator either through intentional or unintentional deposition.

The next stage of this object's life is in March 1861, when it was found in Menchecourt during Sir Charles Lyell's third visit to the Somme valley (Lyell, Notebook 245, pg 137-138). This is supported by the blue bordered, glued label present on the object which reads "Sir C. Lyell, Menchecourt, bed - "e", March 1861". This also gives a context of bed - "e" which demonstrates exactly in which stratigraphic layer Lyell found it in. Lyell's scientific notebooks support this, by not only showing he was present in Menchecourt in March 1861, but also in his description on page 138 of two specimens of knives found at Menchecourt and also a diagram showing the knives in the stratigraphy (Notebook 245, pg 138). Lyell also questions the age of these Menchecourt knives in relation to the hatchets of Moulin Quignon and St Acheul (Lyell, Notebook 245, pg 152).



Photograph taken by Adams (2023) of Lyell's notebook showing the flint knives place in the stratigraphy (Notebook 245, pg 138)

Lyell published his theories of these flakes in ...*Antiquity of Man* and calls them, from the classification of Evans, the third form of implement found in the Somme valley, the other two being spear-headed and oval forms (Lyell, 1863, 92). Lyell states that “some of these chips can only be recognized by an experienced eye as bearing marks of human workmanship” (Lyell, 1863, 92). Lyell also confirms that he obtained several specimens from a pit that he caused to be dug at Abbeville under fluvio-marine beds (Lyell, 1863, 92). Lyell’s connection to this object can be proved through correspondence points of an image of this object and the illustrated Fig. 14. in ...*Antiquity of Man* (Lyell, 1863, 92).

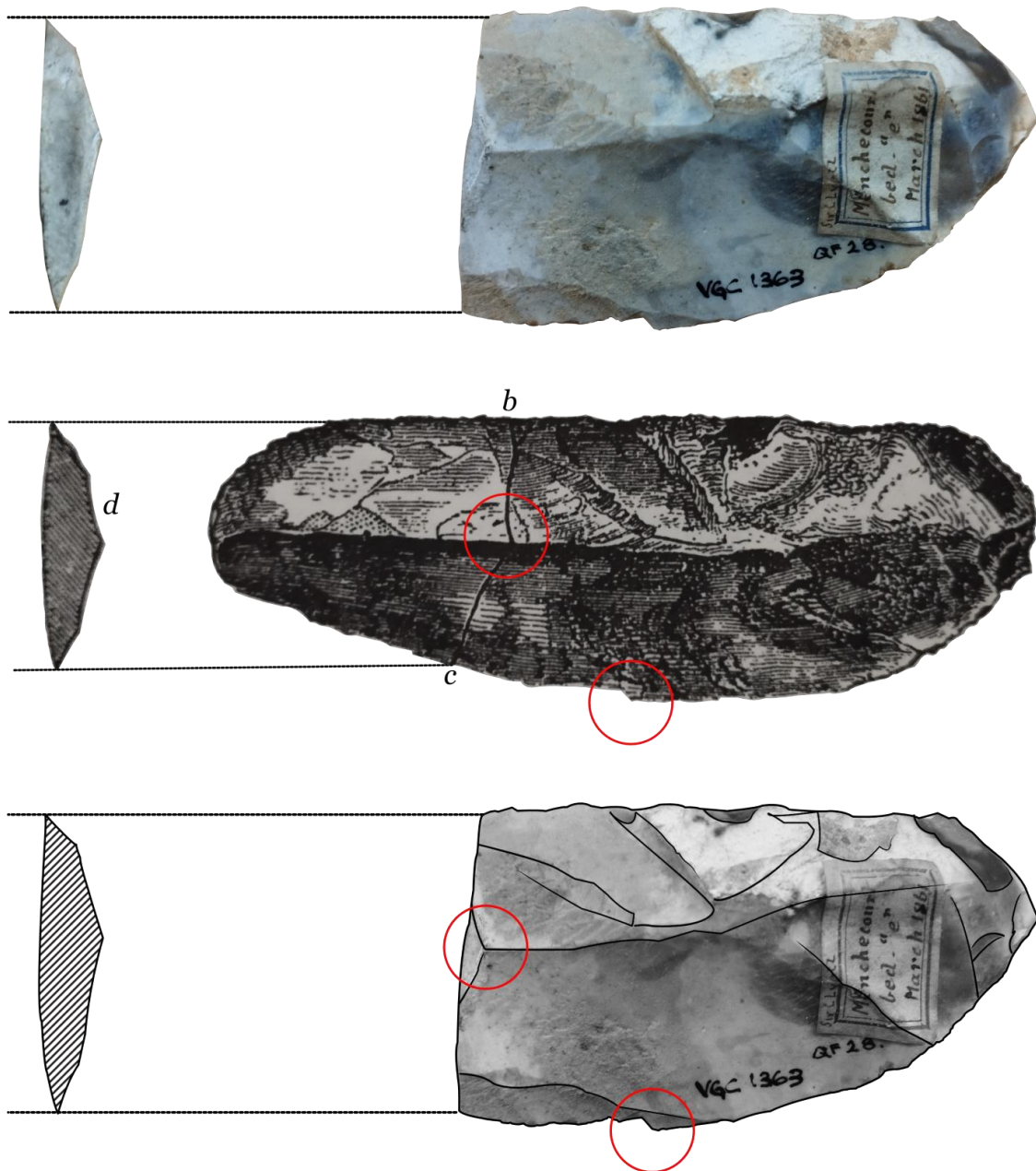


Illustration showing correspondence points and similarities between photographs of VGC1363 taken by Adams (2023) and the specimen illustration of Fig.14 adapted from Lyell’s ...*Antiquity of Man* (1863)

The illustration above shows how the two match morphologically, through the transverse section and from the front view of the object (Adams, 2023). This is further supported by Lyell's description of Fig. 14. as being a flint knife from Menchecourt (Lyell, 1863, 92). Lyell's use of this object provides further information on its life such as that the object must have been fractured post-excavation during Lyell's possession of it since he included what the other half of the object looked like in the figure (Lyell, 1863, 92). Lyell also states that this particular object was found below the sand containing *Cyrena fluminalis*, which provided evidence of human antiquity since this is an extinct species in Europe so the presence of human made flint tools below it means it must be older than the shells (Lyell, 1863, 96-97). Before absolute dating methods were developed in the mid 20th century, evidence of relative dates such as what Lyell found in Menchecourt through stratigraphic analysis was pivotal in supporting a human antiquity period. The object changed its purpose in March 1861, from a complete prehistoric flint flake tool to a broken scientific artefact used by Lyell as an important piece of evidence in proving human antiquity. After 1863 the scientific artefact function remained however with its presence in Lyell's *Antiquity of Man* (1863) it entered equal importance as a historical artefact in the history of Sir Charles Lyell and the antiquity debate in the mid-19th century.

The life of the object is uncertain from 1863. It was likely held in Lyell's own private collection at his family home in Kinnordy Estate, Scotland. In 1927, some of the Lyell collection was donated to the University of Edinburgh from Lyell's descendants at Kinnordy Estate. Separated and distanced from the archival records, the objects provenance and significance was disassociated for almost a century and served a purpose as part of the teaching collection of the School of History, Classics and Archaeology (SHCA). At some point damage occurred and the other half of the object is missing. The object is currently located in the Vere Gordon Childe Collection in a draw labeled 'C11.1 More Misc. French Flints'. Attempts to catalogue this object have been made in 2010 and possibly in 2013. Utilising previous descriptions, the object has now (2023) been properly catalogued and can conclusively be recognized as an object that was excavated, handled and researched by Sir Charles Lyell thus restoring its historical and scientific significance. The work conducted here will hopefully change the purpose of this object from a teaching collection item, precariously intermixed with the Vere Gordon Childe reference collection to a research collection item with the opportunity to utilize the paper archive and digital images, held within the University of Edinburgh's Heritage Collections or as part of an independent Sir Charles Lyell Archaeological Collection held within the SHCA.



Adams (2023)

Accession Number: VGC1368

Locality: Abbeville, France

Name: Flint Hand Axe

Material: Flint

Ownership: The University of Edinburgh

Location in Museum: Vere Gordon Childe Collection, C11.1 (More Misc. French Flints)

Weight: 170g

Dimensions: 10cm x 7cm x 3cm

Biography:

The object is a white flint tool typical of Abbevillian traditions used in hand-axe creation with conchoidal fractures on both faces creating a sharp cutting edge around the circumference.

This specimen can therefore be classified as a bifacial hand-axe. Abbevillian is generally regarded as an early sub-phase of the Acheulean tradition, coined by Gabriel de Mortillet in 1873. The similarity of the simple structure of the cores of Abbevillian flint tools with the Oldowan tradition of Tanzania could make Abbevillian the next step in the evolution of tool

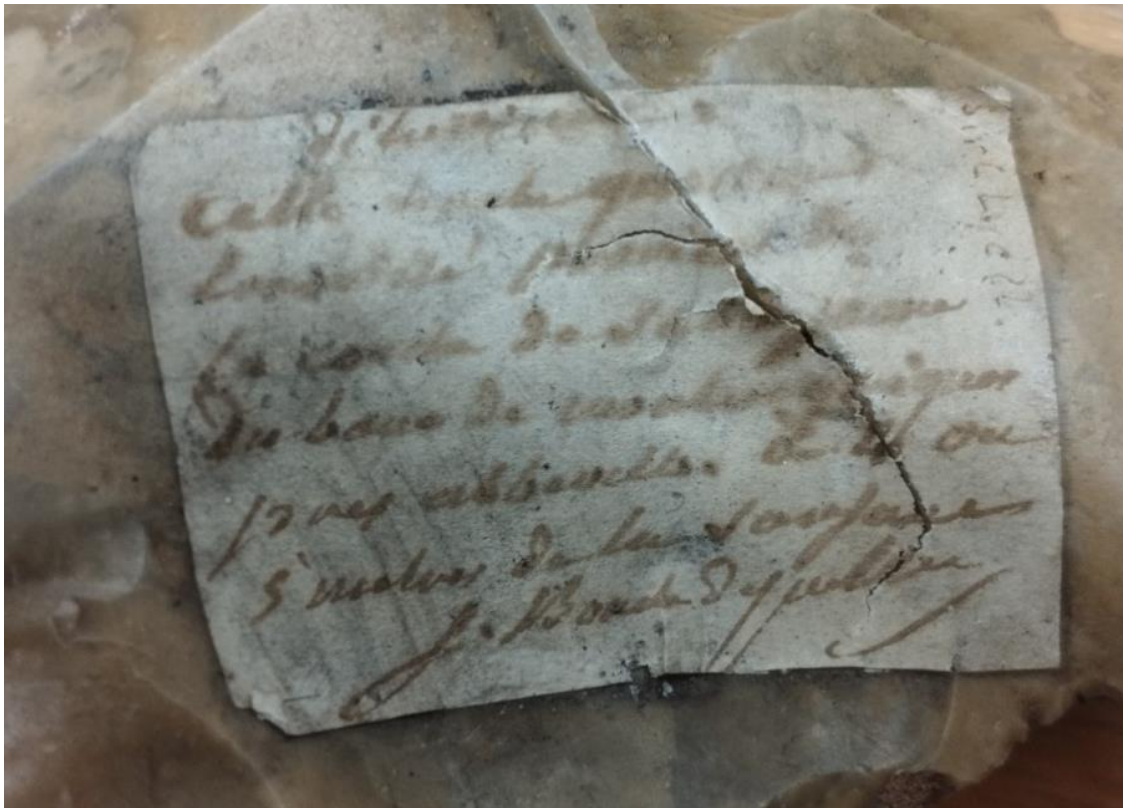
making and would have developed after the African exodus into Eurasia. Therefore, flints such as this one contains important information about how hominid habitation and behavior first evolved in prehistoric Europe. Electron Spin Resonance (ESR), magnetostratigraphic and Uranium- series dating methods have provided an absolute date of the lower Abbevillian levels to being 600 KA ± 90 BP (Bahain et al, 2007, 360). This would be around the time when *Homo heidelbergensis* would be inhabiting the forested landscape (Antione et al, 2019, 1). *H. heidelbergensis* would have deliberately manufactured hand axes such as this one to serve multiple functions and could serve as a multi-tool to tackle the tasks of specialist implements such as scrapers, cutters, cleavers. This tool would have been manufactured by hand through the process of flintknapping by one hand to strike a core and create a sharply flaked biface. This can be seen through the asymmetry of the creation of the edges and a non-central meridian ridge. The tool would have been abandoned by its original creator either through intentional or unintentional deposition.

The specimen was then found in an excavation in 1860 in Abbeville. This can be inferred from a French handwritten glued label on the specimen, see below. Although damaged and mostly illegible the word “*Abbeville*” can be made out on the second line and a date of “1860” is written on the second last line. A second, more recent, glued label on the same face is legible and reads “with shells, Sir C. Lyell”. The object after being excavated ended up in the possession of Sir Charles Lyell at some point in 1860 or after. A third handwritten French label, seemingly contemporary with the first label and of the same handwriting, is visible on the other face. This label is also damaged and partially illegible but the word “*coquilles*” meaning shells is legible on the third line.



Photographs of labels on VGC1368 by Adams (2023)

It is possible that the object was found by Boucher de Perthes in 1860 and then sent to Lyell or given to him in person when the two met in explorations of Abbeville (Lyell, 1863, 88; Lyell, Notebook 243, pg 14). Comparison of these labels with known letters and labels of Boucher de Perthes hand, see below, shows a match of handwriting and confirms that this object was excavated by Boucher de Perthes in 1860 and entered his private collection before being given to Lyell.



Photograph taken by Adams (2023) of a label from specimen VGC1364 which has Boucher de Perthes signature. In looking at the labels on specimen VGC1368 above, there is a clear similarity in the first word of line one and in the way “abbeville” is written on both.

Correspondence from Boucher de Perthes to Lyell between March and April 1860 reveals an interest in extinct shells such as *Cyrena fluminalis* and species of *Cyclas* being present with flint implements. The letter on the 16th March 1860 also records that Boucher de Perthes sent Lyell a boxes of shells in 1860. Since the label highlights the presence of this object amongst shells and the french label reading “*coquilles*” it is possible the object was sent to Lyell in one of these shell boxes. Lyell and Joseph Prestwich were developing their theories at this time after finds of flints with extinct shells, so this object changed its purpose when excavated in 1860 from a prehistoric hand-axe to a scientific artefact used by Boucher de Perthes and Charles Lyell as an important piece of evidence in proving human antiquity.



Photographs by Adams (2023) of the envelope summary written by Lyell showing Boucher de Perthes sent shells from Menchecourt, Abbeville and Boucher de Perthes writing confirming that a “box of shells will arrive at your [Lyell] address on Monday tomorrow or after” (Boucher de Perthes to Lyell, 16th March 1860)

The life of the object is uncertain from 1863. It was likely held in Lyell’s own private collection at his family home in Kinnordy Estate, Scotland. In 1927, some of the Lyell collection was donated to the University of Edinburgh from Lyell’s descendants at Kinnordy Estate. Separated and distanced from the archival records, the objects provenance and significance was disassociated for almost a century and served a purpose as part of the teaching collection of the School of History, Classics and Archaeology (SHCA). Due to environmental conditions and the composition of iron gall ink, Boucher de Perthes’ labels have become partially illegible and are extremely fragile. The object is currently located in the Vere Gordon Childe Collection in a draw labeled ‘C11.1 More Misc. French Flints’. Attempts to catalogue this object have been made in 2010 and possibly in 2013. An incorrect digital catalogue entry for this object also exists, however it does show the labels in better condition indicating that further damage has happened due to it being part of a teaching collection, see below (VGC1368, Gordon Childe Archaeology Collection)



Photograph of VGC1368 on the Gordon Childe Archaeology Collection catalogue (left), Photograph by Adams (2023) (right) showing how the label has had further damage due to its time present in a teaching collection and lack of proper care

Through the research conducted in this paper (2023), the object has been catalogued properly and can conclusively be recognized as an object that was excavated, handled and researched by Sir Charles Lyell thus restoring its historical and scientific significance. The work conducted here will hopefully change the purpose of this object from a teaching collection item, precariously intermixed with the Vere Gordon Childe reference collection to a research collection item with the opportunity to utilize the paper archive and digital images, as well as the conservation studio, held within the University of Edinburgh's Heritage Collections or as part of an independent Sir Charles Lyell Archaeological Collection held within the SHCA.



Adams (2023)

Accession Number: EUCM.0311.2009

Locality: St Riquier, France

Name: Flint Tool

Material: Flint

Ownership: The University of Edinburgh

Location in Museum: Sir Charles Lyell Collection, Box 1

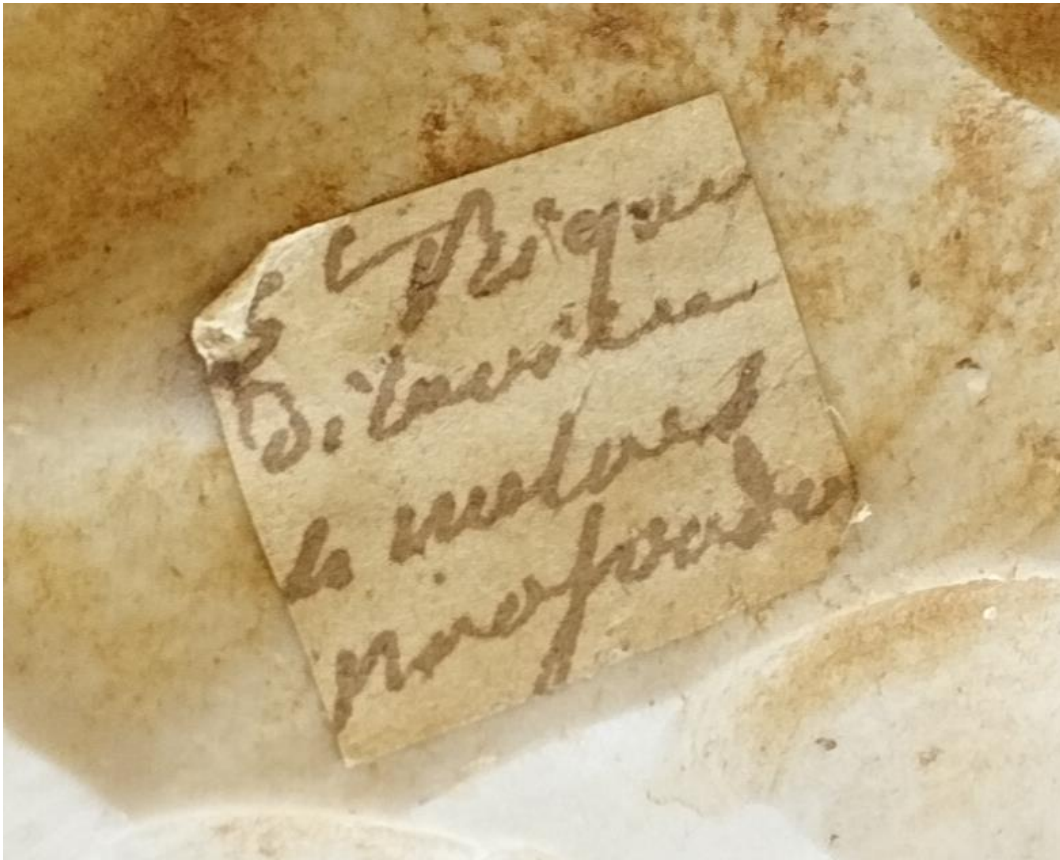
Weight: 95g

Dimensions: 8.5cm x 5cm x 3cm

Biography:

The object is a white flint hand axe with conchoidal fractures on both faces creating a sharp cutting edge around the circumference. Although similar to Acheulean examples and using the same traditions, this implement from St. Riquier differs in morphology with a flat ventral surface and a cupped dorsal face creating an asymmetrical surface. Electron Spin Resonance (ESR) dating places the object's first creation between 670-650 KA BP (Bahain et al, 2007, 360). This would be around the time when *Homo heidelbergensis* would be inhabiting the forested landscape (Antione et al, 2019, 1). *H. heidelbergensis* would have deliberately

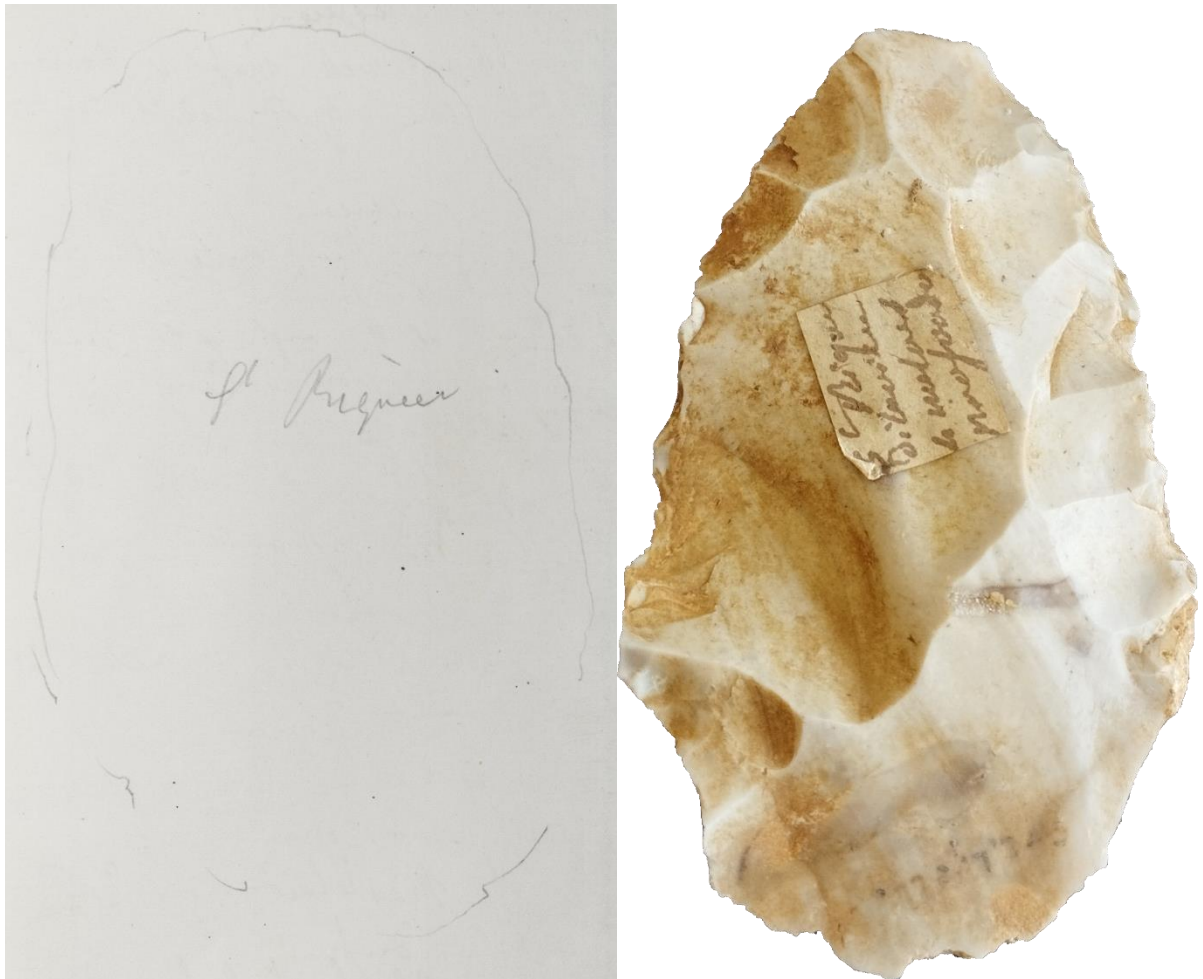
manufactured hand axes such as this one to serve multiple functions to quickly tackle the tasks of specialist implements such as scrapers, cutters, cleavers. This tool would have been manufactured by hand through the process of flintknapping by one hand to strike a core and create a sharply flaked biface. The tool would have been abandoned by its original creator either through intentional or unintentional deposition.



Photograph by Adams (2023) of the glued label on EUCM.0311.2009

The specimen was then found in an excavation in St Riquier probably by Sir Charles Lyell. This can be inferred from the handwritten glued label on the specimen, seen above. Although the writing is mostly illegible the word “St Riquier” and “diluvium” are clear on the first two lines. A loose label reading “Lower Palaeolithic, Saint Riquier, Somme” with the objects confirms this. The object’s relation to Lyell is written directly on it reading “Sir C. Lyell” The object after being excavated ended up in the possession of Sir Charles Lyell at some point in 1860 or after. In his notebooks, Lyell documents visiting St Riquier in his second visit in July 1860, however much more information comes from his third visit from March-May 1861 (Notebook 243 & 246). Lyell notes the morphology of the St Riquier flint examples and compares it to the Amiens type and includes a sketch, seen below, of similar form to this object (Notebook 246, pg 21). However, he fails to comment on the unique characteristics of this flint tool in relation to other Abbevillian and Acheulean examples discussed above and does not

mention St Riquier when discussing typology in ...*Antiquity of Man*. Unlike Boucher de Perthes who discusses St Riquier flints in *Antiquités...* and may be the source of Lyell's acquisition of this object (Prestwich, 1860, 279). When the object was excavated in 1861 its purpose changed from a prehistoric hand-axe to a scientific artefact used by Lyell as an important piece of evidence in proving human antiquity, however failing to develop knowledge of prehistoric archaeology in the process.



Photograph of Lyell's sketch in Notebook 246 (pg.21) (left), Photograph by Adams (2023) (right) showing a similarity of outline between both examples from St Riquier suggesting a possible sub-tradition under Acheulean

The life of the object is uncertain from 1861. It was likely held in Lyell's own private collection at his family home in Kinnordy Estate, Scotland. In 1927, some of the Lyell collection was donated to the University of Edinburgh from Lyell's descendants at Kinnordy Estate. Separated and distanced from the archival records, the objects provenance and significance was disassociated for almost a century and served a purpose as part of the School of Geosciences general teaching collection. On the 03/09/2009, Janet Bell catalogued this specimen and speculated on its historical and scientific importance. Through correspondence with archivists

at the University of Edinburgh's Heritage Collections the object was moved to the Centre for Research Collections and recognized and included as part of the project to catalogue and make accessible the newly acquired tranches of records forming the Sir Charles Lyell Collection. Through the research conducted in this paper (2023), the object can conclusively be recognized as an object that was handled and researched by Sir Charles Lyell thus restoring its historical and scientific significance and changing its purpose to a research collection item



Adams (2023)

Accession Number: VGC0860

Locality: St Acheul, Amiens, France

Name: Flint Hand Axe

Material: Flint

Ownership: The University of Edinburgh

Location in Museum: Vere Gordon Childe Collection, C1 (Palaeolithic France, St Acheul)

Weight: 378g

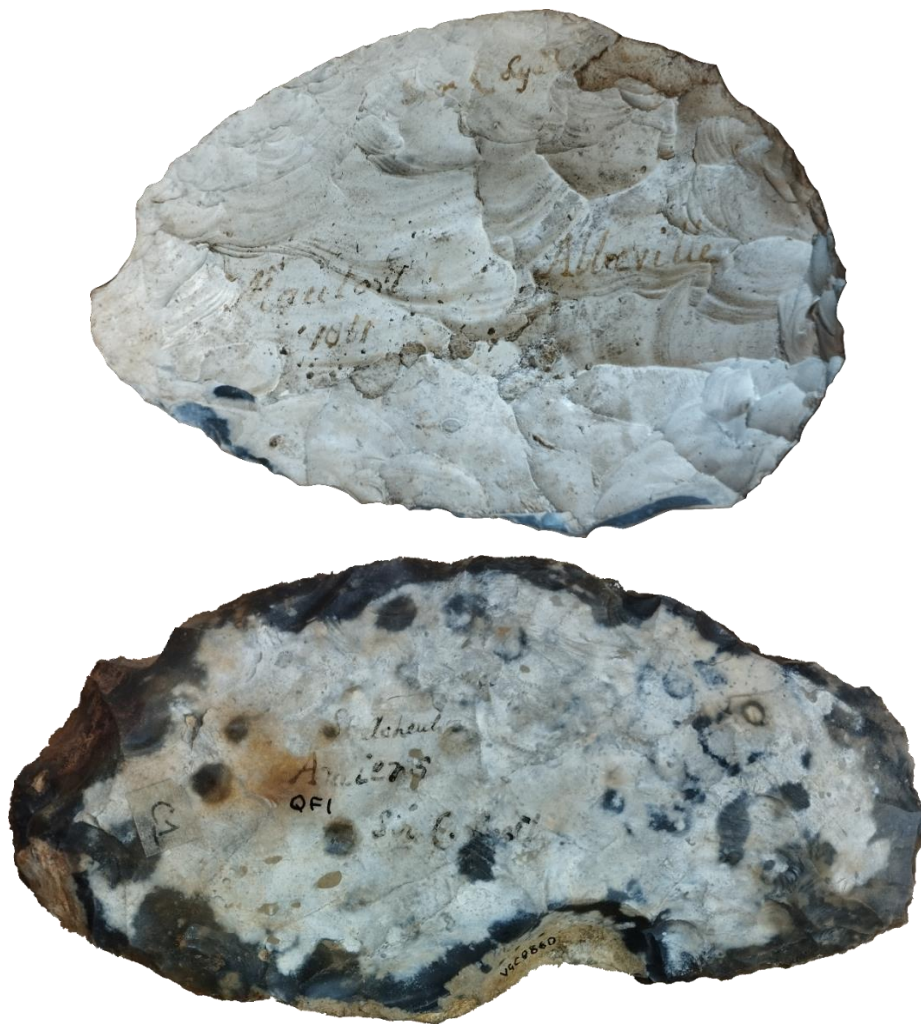
Dimensions: 15cm x 7.6cm x 3cm

Biography:

The specimen is one of the spear-headed examples found in St. Acheul, Amiens. The specimen has deliberate conchoidal fractures on both faces and can therefore be classified as an Acheulean bifacial hand axe. An absolute date of the St Acheul levels was obtained through Electron Spin Resonance (ESR) on quartz and places the object from being created between 670-650 KA BP (Bahain et al, 2007, 360). This date suggests that this object would have been manufactured by *Homo heidelbergensis* and may have been used for multiple purposes,

potentially as a weapon (Antione et al, 2019, 1). The tool would have been abandoned by its original creator either through intentional or unintentional deposition.

The object was then found by Sir Charles Lyell during his excavations in St Acheul, Amiens. This is indicated by the words 'St Acheul, Amiens, Sir C. Lyell' which are written directly on the surface of the object. After Prestwich and Evans' 1859 discovery of ancient flint implements in St Acheul and the following two-year antiquity debate, Lyell visited the Somme valley sites to investigate the presence of flint implements in the same stratigraphic layers as extinct animal remains. He was also studying whether hand axes such as these were made by humans and set out to gain evidence on the subject (Lyell, 1863, 88). In his first visit in July 1859, Lyell deliberately visited St Acheul and notes that he bought sixty hatchets from Amiens (Notebook 238, pg 144). This could be how Lyell acquired this particular hatchet. Lyell also visited Amiens in his second and third visits to France (Notebook 243 & 246).



Comparison of handwriting from photographs taken by Adams (2023) of EUCM.0001.2022 (above) and VGC0860 (below) showing similarity of hand and style suggesting they are contemporary finds

In comparison with the written labels on this object and Lyell's figured specimen from Mautort, seen above, there is a definite similarity in the labelling system used and a match in handwriting which could point to Lyell excavating this object his third visit in March 1861-September 1861, or it was maybe given to him or purchased since there is a lack of date present on this object. Either way the consistency of these two labelling systems and the available information for the Mautort specimen suggests that this object came into Lyell's possession in his third visit to France in 1861. When excavated in 1861 the object changed its function from a prehistoric hand-axe to a scientific artefact used by Lyell as an important piece of evidence in proving human antiquity. In Lyell's ...*Antiquity of Man* he uses Evans' classification to distinguish the spear-headed St Acheul types, such as this object, from the oval forms of Abbeville and the knives of Menchecourt and Montiers, see below. After 1863 the scientific artefact function remained however with its presence as an example of evidence in ...*Antiquity of Man* it entered equal importance as a historical artefact in the history of Lyell and the human antiquity debate in the mid-19th century.



“Fig. 8.

Flint implement from St. Acheul, near Amiens, of the spear-head shape (half the size of the original, which is 7 1/2 inches long).

These spear-headed implements have been found in greater number, proportionally to the oval ones, in the upper level gravel at St. Acheul, than in any of the lower gravels in the valley of the Somme. In these last the oval form predominates, especially at Abbeville.”

– (Lyell, 1863, 89)

The life of the object is uncertain from 1863. It was likely held in Lyell's own private collection at his family home in Kinnordy Estate, Scotland. In 1927, some of the Lyell collection was donated to the University of Edinburgh from Lyell's descendants at Kinnordy Estate. Separated and distanced from the archival records, the objects provenance and significance was disassociated for almost a century and served a purpose as part of the teaching collection of the School of History, Classics and Archaeology (SHCA). The object is currently located in the Vere Gordon Childe Collection in the SHCA William Robertson Wing, in a draw labeled 'C1 Palaeolithic, France'. Attempts to catalogue this object have been made in 2010 and possibly in 2013. Utilising previous descriptions, the object has now (2023) been properly catalogued and can conclusively be recognized as an object that was excavated (probably), handled and researched by Sir Charles Lyell thus restoring its historical and scientific significance. The work conducted here will hopefully change the purpose of this object from a teaching collection item, precariously intermixed with the Vere Gordon Childe reference collection to a research collection item with the opportunity to utilize the paper archive and digital images, held within the University of Edinburgh's Heritage Collections or as part of an independent Sir Charles Lyell Archaeological Collection held within the SHCA.



Accession Number: VGC1366

Locality: Montiers, France

Name: Flint Scraper

Material: Flint

Ownership: The University of Edinburgh

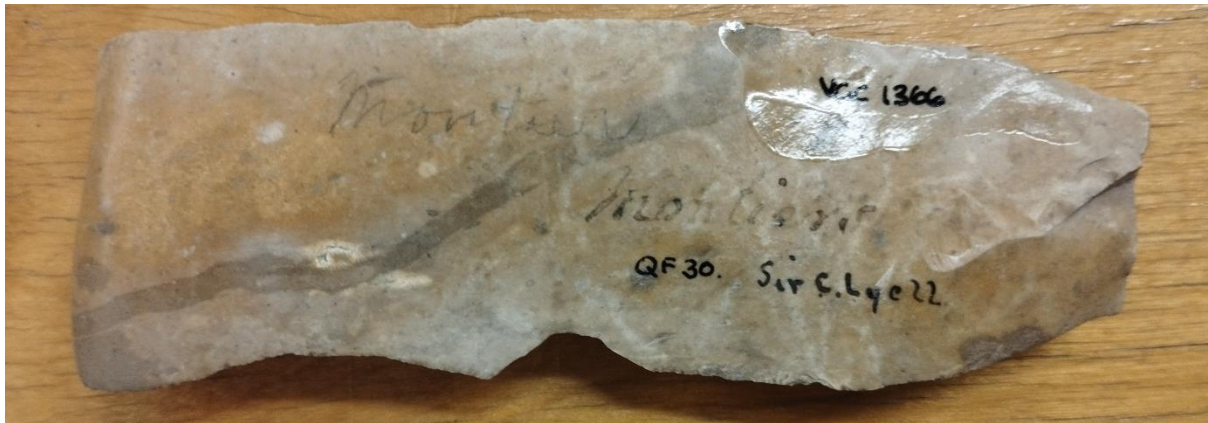
Location in Museum: Vere Gordon Childe Collection, C11.1 (More Misc. French Flints)

Weight: 41g

Dimensions: 9.3cm x 4.3cm x 0.8cm

The object is a light brown/beige flint knife. It appears to be a uniface flake which has been artificially manufactured on one face after being fractured from a larger prepared core. It can be categorized as a scraper tool from French palaeolithic. It has a sharp cutting edge around the implement leading to a point which has now been chipped off. The opposite end is curved and smooth. This object would have been used for light butchery or hide preparation. The creator of this object would have used hand flint-knapping techniques on the dorsal to create this edge, leaving the freshly fractured ventral surface unaltered. The tool resembles the uniface tools

made in Abbeville despite Montiers being south of Amiens in the Oise department of Northern France. Electron Spin Resonance (ESR), magnetostratigraphic and Uranium-series dating methods have provided an absolute date of the lower Abbevillian levels to being 600 KA \pm 90 BP, which would place the manufacture of this object around the time of *Homo heidelbergensis* (Antione et al, 2019, 1). The tool would have been abandoned by its original creator either through intentional or unintentional deposition.



Photograph by Adams (2023) of the writing of “Montiers” twice on VGC1366

The specimen was then found in an excavation in Montiers probably by Sir Charles Lyell. This can be inferred from the writing on the object, seen above, which reads “Montiers, Montiers, Sir C. Lyell”. In his notebooks, Lyell documents visiting Montiers in his third visit from March-May 1861. Sir Joseph Prestwich was also involved in excavations at Montiers and communicated with Lyell on the 8th October 1861 about finding more worked flints at Montiers. In Lyell’s ...*Antiquity of Man* he discusses flint knives in gravel at Montiers and notes finding flint knives with Prestwich. Here he mentions a particular flint knife which he describes as “flat on one side, but the other carefully worked, and exhibiting many fractures, clearly produced by blows skilfully applied” (Lyell, 1863, 105). Lyell’s description matches this object, and although can’t be said for certain if it is the exact one he mentions, this example of uniface flint knife is an example of what Lyell and Prestwich used to confirm a human period in the lower gravels of Montiers, with its contemporaneity with hippopotamus tusks and elephant molars. When the object was excavated in 1861 its purpose changed from a prehistoric scraper tool to a scientific artefact used by Lyell and Prestwich in 1863 as an important piece of evidence in proving human antiquity by its presence with extinct Mammalia in the region of the Somme valley.

The life of the object is uncertain from 1863. It was likely held in Lyell's own private collection at his family home in Kinnordy Estate, Scotland. In 1927, some of the Lyell collection was donated to the University of Edinburgh from Lyell's descendants at Kinnordy Estate. Separated and distanced from the archival records, the objects provenance and significance was disassociated for almost a century and served a purpose as part of the teaching collection of the School of History, Classics and Archaeology (SHCA). The object is currently located in the Vere Gordon Childe Collection in a draw labeled 'C11.1 More Misc. French Flints'. Attempts to catalogue this object have been made in 2010 and possibly in 2013. Utilising previous descriptions, the object has now (2023) been properly catalogued and can conclusively be recognized as an object that was excavated, handled and researched by Sir Charles Lyell thus restoring its historical and scientific significance. The work conducted here will hopefully change the purpose of this object from a teaching collection item, precariously intermixed with the Vere Gordon Childe reference collection to a research collection item with the opportunity to utilize the paper archive and digital images, held within the University of Edinburgh's Heritage Collections or as part of an independent Sir Charles Lyell Archaeological Collection held within the SHCA.

Appendix B: Lyell & Pengelly

Lyell's queries on Brixham Cave from:

[Sir Charles Lyell to William Pengelly]

24th November 1861

&

Pengelly's responses from:

[William Pengelly to Sir Charles Lyell]

27th November 1861

2- Lyell- My second query is Can you refer me to any published abstract Brit.afsocs report by you or Falconer on Brixham?

Pengelly- No report on the Cavern (Brixham) by Falconer or myself has ever been printed. Our account of a large amount of red tape I forbore to send an abstract of my paper read at Leeds, for insation in the Brit. Asoc. Report, and on the same account I burked my lecture at the Royal Inst. A report of progress was prepared by Falconer confined by him, Ramsay and myself and sent into the Brixham Cave Committee. Ramsay send this immediated after my paper of Leeds. I have a copy of it by me which I now send you. Be so kind as to return it when done with it. After that speech on the Cavern which I delivered in Liniver, Feb 19th 1861 at a joint meeting of the ethnological and archaeological societies, is correctly reported in the "Geologist" for April 1861, Page 153. And the "Geologist" for October Last and a paper which I had at Manchester on the new Cavern at Brixham; it is printed in entrise and contains a description of the Brixham Valleys and the sepitirix of the Caverns (the famous caverns)

3- Lyell- Is not the Brixham limest. Devonian?

Pengelly- yes (probably) middle devonian

4- Lyell- Before you worked out the bone earth & stalagmite what was the average height of the natural levels and were they sometimes choked up with gravel and bone earth up to the roof?

Pengelly- Prior to January 1858 no one had the least suspicion that a cavern existed at Brixham (see "Geological" for April 1861) all the external entrances (we are acquainted with five) were

found in the course of working on excavating after Philip, the proprietor, had discovered his Cavern by directing through the roof. The entrance were all filled with ...limestone and earth, in more cases finds eliminated of other. In the interior of the galleries were ...mulabrays(?) filled to the roof. The upper int face of the bed of the earth is 95 feet above the sea level.

5- Lyell- Was there any one horn or antlers of reindeer sticking in the stalagmite who gave it name reindeer gallery?

Pengelly- There was only one antler of a reindeer lying on and cemented to the stalagmite. Remnants of the same species are cut below the stalagmite. Bones of other animals were also found(?) to the upper surfaace of the stalagmite, and imbedded in it, not visible at either the upper or under surface was a fine humerous of the Cave Bear.

6- Lyell- Am I right in thinking that the mud in what the bones lie in of a reddish colour

Yes- ochreous in appearance

7- Lyell- 9 uniasun (?) that it came was chiefly deplored under the direction of Prestwich, Falconer and yourself. More names unleft maraidath (?) would bore my readers

Pengelly- By a minute of the Cave committee "the conduct of the excavations was consigned to Mr Prestwich and Mr Pengelly" Dr Falconer saw the cave in April, Mr Prestwich in June 1858. The lease was signed after the visit of the latter, the work began about the middle of July. Before either of them saw it again all the great discoveries had been made. From first to last the excavation was solely made my superintendence.

8- Lyell- The mammalia of which Falconer told me were as follows: Mammoth, *Rhinoceros tichorhinus*, *Ursus spelaeus*, *Hyaena spelaea*, *Felis spelaea*, Reindeer, Equus, Bos, Rodent. Can you add to this list!

Pengelly- I cannot (see Falconer's report in progress now sent)

9- Lyell- Falconer showed me a core or nucleus of flint from what flint flakes or knives had been struck off and I noted it as from the gravel. But I understand that other flakes were all found in bone-earth and Cav druva (?) in it?

Pengelly- The so called "Core" was formed in the bone-earth, not in the gravel. Was it not rather a tool than a core? I feel confident that Falconer thought so. Though I thought it was a core and always thought of it as the "Father of Flint -Knives". All the decided implements were formed at the base of the bone-earth as low as any bones were met with, many bones were found higher, the humorous in the stalagmite to wit, but none lower. A few embedded flints occurred in the gravel. A Ball, I think of small stone, as sound as if burned in a ...was formed in the bone earth. I am not prepared to say it is artificial, it is with the collection at Somerset House.

10- Lyell- I noted that the Brixham limestone with the bone caves had valleys on E. N. + West, is it not so?

Pengelly- The Brixham valleys have the same directions as the galleries of the Cavern and the limestone fissures generally, namely

11-Lyell- Were any flint knives found in bone earth at the place where the left hind leg of *Ursus spelaeus* occurred, or near that place at same or lower level.

Pengelly- The best implement we found was near (horizontally) the leg of the bear, both were at the same level, namely at the base of the bone-earth bed & both nearly under the great antler. I.e. near the junction of flint knife and Reindeer gallery (see plan, now sent).

12- Lyell- were the flint knives numerous and in more or in all of the galleries.

Pengelly- About thirteen or fourteen in all, they were chiefly found in the reindeer and flint knife galleries one or two were found in the Plu gallery (see plan)

13-Were there not coprolites of hyena and enamel bones in the bone-earth?

Pengelly- there were no coprolites. I do not think there were any indications that the cave had been inhabited; all its contents appeared to me to have been washed in.

[Sir Charles Lyell to William Pengelly]

53. Hartley Street. 7th Feb 1863

My dear Sir

I suppose I am still a member of the Brixham Cave Committee, therefore have as much right to ask why your contribution has not appeared as any one else. Without therefore consulting Dr Falconer, I write to regulate when you gave me the information of which I have so fully availed myself in my 6th Chapter, I fully expected that papers by yourself, others or some one or more special memoirs on the Brixham Cave, would appear before my book.

I had no wish or expectation (as I can tell Dr Falconer) to anticipate him or you. He has written to me in appreciation of parts of my book (Ch.24) he had not I think read Ch.6. but must have seen the title.

I regret exceeding the top of 5 weeks or more since your paper was written. When I see Dr. F. (Falconer) I shall tell him I have written to you to send up your paper to town, and to tell me why you and others are so long about the report, for it is discouraging to the R.S. (Royal Society) not to see some fruits of their grant of money.

I am very decidedly of opinion that the committee should push out whatever instalment they can get and yours is a natural precursor of the paleontological part. It is the more provoking pending your candidanship to the R.S. that this hitch should have been made.

I will speak to Prestwich, take care not to do anything that can offend Dr Falconer, who will be reasonable in the long run.

Sincerely yours

Charles Lyell

[Sir Charles Lyell to William Pengelly]

11th Feb 1863

My dear Sir

I have not yet spoken to Falconer, wishing first to know what others thought.

Knowing the probability of indefinite delay, I am truly sorry about this hitch.

I do not know who is the other person besides you, who according to Prestwich has written papers, nor do I see any harm in three or four memoirs. I must take care that Dr Falconer who always believes he is coming out with this and other papers does not feel himself driven by you and me.

Cha Lyell

Murray says he has sold so many copies of my new book that a reprint may be called for any day, so if you have seen errata et corrigenda, do me the favour of sending them.

[Sir Charles Lyell to William Pengelly]

London, 18th Feb 1863

My dear Sir

I thank you much for the notes and corrections on the Torquay Cave, all of which are adopted including the mention of this Vivian.....(errata given)

Although the errata already amount to about 40, scarcely anyone has hit on its same mistakes or another, even of the attentive readers.

So when you have read more you will greatly help me by sending any remarks.

The history of the obstacles put in the way of your publishing the Brixham results makes me somewhat indignant and if I were not afraid of doing mischief, I should take it more vehemently, but I shall not forget it. I shall tell the Pres' of the R.S. how the matter stands, how injurious I consider it to be to you personally. Believe me

Cha Lyell

[Sir Charles Lyell to William Pengelly]

London, 23rd Feb 1863

Private

My dear Sir,

I have talked with the Pres' of the R.S. about the unfair detention of your valuable instalment of the Brixham paper, saying at the same time that I feared to "kick up a row" as it might prejudice your election. He said that he knew that some of us, who were the best judges, considered that you ought to have been preferred last year, although he thought it nearly an understood thing that you were to come in this time. After this I am inclined to "leave well alone" for a few months, afterwards by no means to go on "singing small" as you term it.

As to waiting for the other, I do not expect four years will do anything, so when you are F.R.S. I would send in the paper.

I have worked in all your corrigenda into my book it is singular how different they are from about 40 furnished by others.

I am living in danger (?) of being called upon suddenly to reprint, but would rather have some weeks to improve. If you happen to have any more suggestions do not delay them.

Believe me

Cha Lyell

Evan's letter is very good. It will make a grand case - The cave- Betula hava (?) - the Torquay elephant - the raised beach and all

[Sir Charles Lyell to William Pengelly]

Post office, Margate, April 9. 1863

Private

My dear Sir

I am on an Easter excursion and I have first glanced at Dr Falconer's explosion in the athenaeum - You will oblige me by telling me whether Falconer has put in print anywhere the facts of the Brixham Cave, and where - Are they not M.S. documents to which he appeals.

Prestwich I know put a note about Brixham in the Geol. Quart. Journal.

I was told that Falconer thought you too prominent in my book and *hime illoe lacrymae (?)* - I shall be short, quiet in my reply. No one will say that the general tone towards Prestwich, Dr F. is unfair. Please tell me all you can being on the facts and history. Cha Lyell

[Sir Charles Lyell to William Pengelly]

Margate, April 12 1863

My dear Sir. On reading over with a view to answering Dr Falconer in the athenaeum, I am struck with what I consider the unhandsome way in which he wishes to take to himself the whole credit of the Brixham Cave exploration, the planning, executing, drawing inferences- Now I should very like to say that the non-publication of Dr F's report has kept back for nearly (four?) years W Pengelly's memoir, that with every disposition to do justice to Dr Falconer as a geologist and anatomist, I have no hesitation in saying that I note W Pengelly's power in

judgement as an observer and reasoner as highly astute as anyone who has taken part in the Brixham Cave exploration or something in that effect. I do not fear any consequences as to the R.S. for it will cal (?) both ways, Falconer is already out of humour at your sharing the credit. The Westminster reviewer writes in reference to Brixham "W Pengelly, Dr Falconer" which will of course be wormwood to his reality.

Had I not better say in answer to Falconer as to whom I got my information about Brixham that it was chiefly from W. Pengelly- Believe me truly yours

Cha Lyell

[Sir Charles Lyell to William Pengelly]
53 Harley St. London, 20 April 1863

My dear Sir,

I see that I had omitted to put the correction which you alluded to before, though it was only attended to in its next edition.

If I were you, I would not go to the expense of coming up to its P.R.S's meeting. I am glad he has sent you the card, he looks on you already as one who should, will be F.R.S.

I am glad you approve of my reply, as do my friends generally, most of whom expecting a rejoinder, are strong in urging me not again to reply. I hope I shall not and as probably shall not allow myself to be provoked, Its Torquay people may as well know that I mean to leave its field open to any one, also may be pleased to leave its field open to any one also may be pleased to tell the world, that its Natural History Socs of your town though ignored by H.F. (Hugh Falconer) did really initiate the proceedings. I should have liked to have said this, but did not wish to appear to have been getting up the Torquay Cave.

C. Darwin writes to me approving my letter and lamenting the virulence of Falconer, which appears to him unaccountable, but not so much so to me, as I have been unwillingly privy to similar outbreaks of papiers (?) and morbid feeling against others, who were fellow labourers in the last 8 months.

Truly yrs
Cha Lyell

Appendix C: Lyell & Lubbock

[Sir Charles Lyell to Sir John Lubbock]

53 Harley Street, May 30/65

Dear Lubbock.

My proof sheets on the Danish Kitchen-middens and the Swiss lake-dwellings are unfortunately destroyed, and I can only ascertain from grivister (?) the exact date when they were just up in type.

They were first set up for the "Elements" in smaller type and afterwards, when my plan of publication was changed put into larger type, that of the *Antiquity of Man*, before I received your first paper. They were written before you went to Denmark, as they stand now, they make the same number of pages and almost the same number of lines as at first a few lines shorter because I abridged one page in order to make soon for a note acknowledging your papers.

It was impossible for me to read and re-read Morlot's papers, sent to me in English in his handwriting before you started for Denmark, to have a correspondence with him which I still retain and with Claparde as before stated, without hitting upon all the most striking points to which you allude, such for example as the wild swan proving that the kitchen-middens were going on during winter (Morlot p16), that the succession of Danish forests was synchronous with the ages of stone, bronze and Iron (Morlot (pp27 x 29), that there was no grain or cereals etc.

I told you before your book came out that I admitted that I must have seen your Danish paper and re-touched and re-worded several passages from your text but not so many as you think; I was surprised to find it so when you first called my attention to the fact: But as I stated they were always in substance the same as now, which is quite intelligible as you say in your note just received "Of course we have neither of us any claim to originality in the matter you might have obtained all the information in your chapter on Danish archaeology from Danish sources and from Morlot's papers"

I fully admitted to you that you were quite right in pointing out that the coincidences in your book and mine were not caused by your copying from me. It is the manner in which you worded your note at page X and your one to allude to the verbal and written communications on the subject which I had with you of which I complain you say that you did not feel authorised to print what I wrote and what I said when talking with you. How you could have felt any doubt is unintelligible to me; you might have asked me if you had any hesitation and you

ought to have been glad to give my explanation which would have been satisfactory to those who know me better than you do.

Mutual friends, you say, think I have no reason to complain but I feel sure that they never saw any former letter to you before they read your note at page X. Had they seen it they would have recommended you to insert my explanation of the true assertion in my note that my chapter was written before your first paper and they would also have suggested that you should state in the same note at page X there was nothing on Danish archaeology that we might not both have derived from common sources and that you were only anxious to show that you had not borrowed from me and not by implication to set up a claim of originality for discoveries taken without acknowledgement by me from you. Had they known all and allowed your note to stand as it is they would have shown themselves no friends of mine still less of yours .

C.L.

Appendix D: Lyell & Prestwich

[Sir Charles Lyell to Sir Joseph Prestwich]

17 March 1861

My dear P.

I have just received your note and regret that even when opinion, and friendship of value so highly should have felt any dissatisfaction at my mode of treating those subjects you allude to. is I had thought it fair to impose on you the task of helping me to improve my proof sheet I should most gladly have done so.

I trust you will frankly tell me what were the points whether to reference to facts and statements or to expression as to yourself which you would have wished otherwise worded or compared.

Had I not at p. 103 when I first refer to the part you took in the Somme Valley case said of your authority in previous work etc

As much as I regret to have it is not my way to deal in eulogies....I have already in prefaces on 2nd edition made one reference to your paper and to Dr Wyatts geo tracts about Bedford which I have admitted before this section at p.162 I abridged so much that I did not feel at liberty to put your name to it.

I wish much you had written to me before I feel certain that I could have been able to comply with your wishes when amending the text without allowing the pages ...keeping the type up.

M Boucher de Perthes has sent me a warm letter about my book with an account of some new discoveries which he has probably sent you. Darwin has the letters, but I should like you to see also.

I do this on principle because my taste is often offended by the panegyric style applied right and left by some authors- But I trust on the account I do pay a compliment of the fellow labourers (it tells more, and I am always anxious to do justice)
